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Editor-in-Chief: Prof. Arch. Paul Mwangi Maringa (PhD), CBS, FAAK, MKIP

DAID FORUM FOR RESEARCH AND DESIGN SOLUTIONS

Volume One
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DAID FORUM FOR RESEARCH AND DESIGN SOLUTIONS

Sports, Commercial Centres and High Rise Office Building Research and Design Solutions

Volume One
2023/2024 Edition

Prof. Arch. Paul Mwangi Maringa (PhD), CBS, FAAK, MKIP,
Editor-in-Chief

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FORUM FOR RESEARCH AND DESIGN SOLUTIONS

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FOREWORD

As I reflect on the incredible journey of the past semester, I am filled with immense pride and admiration for the exceptional work accomplished by my students. This collection is not merely a showcase of design projects; it is a testament to creativity, perseverance, and growth.

Each project within these pages represents countless hours of exploration, experimentation, and refinement. They are not just products of technical skill, but also of passion and dedication. From the initial spark of an idea to the final Design, our students have demonstrated a remarkable ability to blend imagination with practicality. What stands out most in these designs is their diversity and innovation. They span a spectrum of disciplines-from building design, landscape design, interior design and graphic design; from architecture to user experience. Despite this diversity, the student works all share a common thread of pushing boundaries and challenging conventions. The students have fearlessly tackled real-world problems, proposing solutions that are not only aesthetically pleasing but also socially and environmentally conscious. In addition to technical prowess, these projects reflect a deep understanding of design principles and a keen awareness of the impact design can have on society. They showcase thoughtful consideration of user needs, cultural contexts, and ethical implications - a testament to the holistic education our students receive.

I am profoundly grateful to our students for entrusting us with their creative visions and for their unwavering commitment to excellence. I am equally indebted to our faculty and staff whose mentorship and support have nurtured these talents. Together, we have cultivated an environment where innovation thrives and where each student has the opportunity to realize their full potential. Congratulations to all the students whose work graces these pages. Your creativity knows no bounds, and your futures are as bright as the designs you have crafted. May this book serve as a testament to your hard work and as a source of inspiration for generations of designers to come.

To the readers of this book, I invite you to embark on a journey through the minds of our future designers. Prepare to be inspired, challenged, and moved by their ingenuity and passion. This collection not only celebrates their achievements but also marks the beginning of their transformative impact on the world of design.

Warm regards,

Dr. Rehab Hamdi Elnaggar (PhD), EEE-EES.

Year Master, B.Arch IV, Department of Architecture and Interior Design (DAID),

School of Engineering and Architecture (SEA), Kenyatta University (KU).

EDITORIAL NOTE

Curiosity, inquiry, experimentation and discovery are intrinsic aspects of creative learning in a scholarly environment. Unlocking creativity in architectural designers requires bold, flexible minds that are not afraid to pursue their imagination albeit within the confines of structured thought. Here, the range of possible solutions is as diverse as the designers and contexts as well as the available local and international precedence that provides the practical and experiential inspiration for design thought. We present here such unconstrained, orderedly reflections, vibrant with the vision and energy of youthful minds. The emerging ideas are cultured through practical and well sequenced design principles and procedures. The young scholars all share a declared commitment to produce designs solutions that responsibly, creatively and uniquely address real life problems in real spatial settings, for real clients and with a creative difference.

Through these works, we share here our persuasion and time tested approach to practical, contextually relevant creative design solutions of architectural design problems that have been firmed up in the learning environment. This approach recognises that novelty does not occur in a vacuum but is rather nurtured and enriched by dynamically transforming live experiences, anchored on the incident natural socio-physical settings. This process therefore takes the nascent designer through a sequential appreciation of precedence, site analysis, philosophical underpinnings of design. Then follows design resolution where the design evolves progressively from reiterative and regular studio crit reviews of brief analysis, site selection, and conceptualisation. Thought here is founded upon a well researched understanding of the client, social values and spatial tenor). Design resolution then follows and on to constructibility, and representation through various annotated graphical and modelling media.

Welcome to this didactic discourse of an empirical, creative architectural design process.

Prof. Arch. Paul Mwangi Maringa (PhD), CBS, FAAK, MKIP,

Adjunct Professor of Architecture and Planning, Department of Architecture and Interior Design (DAID),

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- Simon Mwendwa

PREFACE

1. The intention here is to synthesize the design themes, areas of technology, and graphic methods while simultaneously integrating design that manages multiple objectives in the same project. This is achieved through the negotiation of formal, technological, and social variables. As such, one sets out to resolve a complex programme on a complex site in a manner that articulates a mature design sensibility and demonstrates a sophisticated understanding of architectural technology with the following discernible outputs:

    a. To understand & apply the complexity and methodology of handling large projects through group design, involving urban environments and prevailing building regulations.

    b. Develop a design impulse with systems-thinking that emphasises relationships and interactions between those components above the character and exigencies of the individual components themselves.

2. The designers then undertake a complex design project with various design parameters, guided by a sound information base and well-structured rational analysis of such information, consistent with a data driven decision making paradigm.

    The physical, social, technological complexity of the project and coordinated graphically represented outcomes will serve as evidence of an understanding of integrated building design.

3.The designers identify a small to medium sized project within one of the following three thematic areas:

    a. Sustainability with a focus on materials, technologies, cultural expression.

    b. Environment with a focus on orientation, ventilation, thermal comfort, acoustics, daylighting, and other such similar concerns.

    c. Functionality and design efficiency with a focus on functional design , efficient use of space, and open spaces.

4. The projects are of appropriate complexity to test advanced integration of social-cultural, pragmatic, technological, urban, and environmental aspects. They are selected from the following three types of projects:

    1. Sports Centre
    2. Commercial Centres
    3. Office Buildings

5. The project sites in turn are selected from among the following three options:

a. Westlands site
b. Parklands site
c.Limuru site

SITE INFORMATION

1. WESTLANDS

https://maps.app.goo.gl/Tis4Gd7KaeqjyPnX6

2. PARKLANDS

https://maps.app.goo.gl/dWg88spS5NSMT9sr7?g_st=iw

3. TIGONI

https://maps.app.goo.gl/CvcsU6nZdyFZXz5A6?g_st=iw

CHAPTER ONE

PREPARATORY PHASE OF DESIGN

PART I: CASE STUDIES

A. SPORTS CENTRES

The focus of discussion here is on well analysed international, award winning precedents of architectural design projects of Sports Centres and in their analysis that emphasises concepts and technical considerations

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

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CASE STUDY ONE: ASIAN REGION
SINGAPORE SPORTS HUB

BACKGROUND INFORMATION

The project proposal was based on a report by the Committee of Sporting Singapore calling for the city-state to promote a culture of sports, and replace the aging National Stadium.

The Singapore Sports Hub is situated on a 35-hectare site in the heart of Singapore, adjacent to the Kallang Basin.

It comprises of a 55,000 seat stadium, an aquatic centre (the OCBC Aquatic Centre), a multi-purpose indoor arena (the OCBC Arena), and a variety of retail and commercial developments.

CONTEXT

The whole precinct is unified by a consistent philosophy and design approach to landscape, shade and shelter and lighting, providing levels of comfort and quality of experience appropriate to Singapore's tropical climate and public expectations.

(*Singapore National Stadium Sports Hub Drone Stock Photo 1329959072 | Shutterstock*, n.d.)

(*Gallery of Singapore SportsHub / DPArchitects - 55*, n.d.)

(*Sports Hub: How to Get There*, n.d.)

PROGRAMME

(Wai, n.d.)

- 55,000-cap.National Stadium with a retractable roof & movable seating
- Community facilities i,e basketball, netball volleyball courts plus running & cycling paths
- Singapore Indoor Stadium, an existing 12,000-seat indoor arena

(*Singapore Indoor Stadium [2024]*, n.d.)

(*OCBC Aquatic Centre at the Heart of Singapore's Aquatic Community - Australasian Leisure Management*, 2018)

- OCBC Aquatic Centre with 3,000 permanent seats, expandable to 6,000

- Community facilities i,e basketball, netball volleyball courts plus running & cycling paths

- A Sports Museum, Library, Shimano Cycling World & Kallang Wave Mall

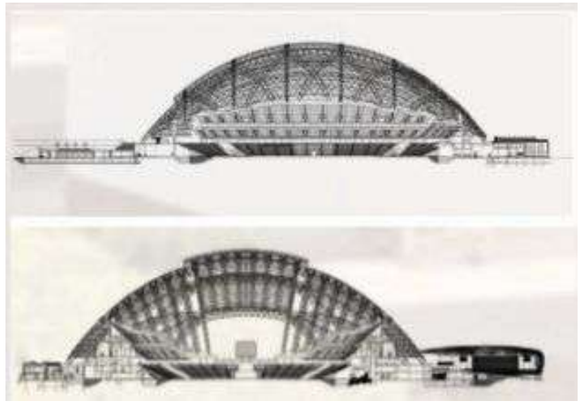
(*Gallery of Singapore SportsHub / DPArchitects - 3*, n.d.)

- OCBC Arena, an indoor sports facility.

(Circle, 2024)

- The Water Sports Centre, a kayaking and canoeing facility

STRUCTURE AND MATERIALS



(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

The main body structure used a conventional structural system, in the form of concrete construction to effectively hold tribune loads.

The bowl cooling system;
The Stadium has an innovative bowl cooling system, cool air of 23 degrees is pumped from underneath all seats, using less than 15% of the energy required for similar conventional air-conditioned stadiums. It's also partially powered by solar panels, making it even more environmentally-friendly.

LANDSCAPING

- Green Philosophy – creating a truly sustainable and innovative precinct

(worldarchitecture.org, n.d.)

Hub integrates landscape, water systems and planting extensively, creating a natural setting and high quality public waterfront environment. The major public and landscape realms at the waterfront promenade and arrival plazas extend and enhance the city's accessibility and green ambience.

(*Gallery of Singapore SportsHub / DPArchitects - 3*, n.d.)

For comfort, character and further extending this holistic approach, the stadium incorporates sky terraces with planting with vertical greenery to the edge of internal concourse areas, creating a totally unique and tropical experience

(*Gallery of Singapore SportsHub / DPArchitects - 3*, n.d.)

Unique outer space. In response to this, outdoor space that has a pessimal size for formal event functioned as a space with high flexibility activities to adapt to changes both perceptually and physically.
The outdoor spaces around the site are also connected directly to the indoor space.

SERVICES

1. Lighting:
The retractable roof of the stadium features an innovative lighting system that is embedded with 20,000 LEDs and can act as a giant screen with the projection visible from both inside and outside the stadium.

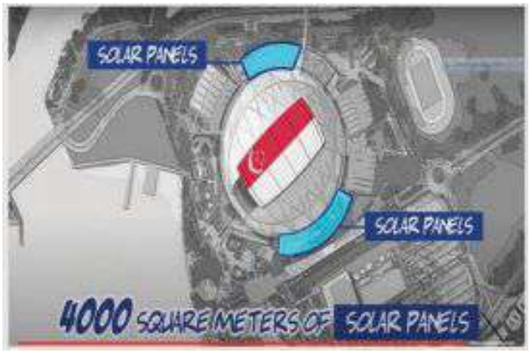
(*Gallery of Singapore SportsHub / DPArchitects - 3*, n.d.)

2. Lifts and escalators:
Vertical circulation is achieved by regular lifts and escalators.
The stadium though, is fitted with a huge travelling scissor lift that moves around a track under the stadium on a cushion of air pushing the lower tier of seats over the running track.
This left a nine metre wide gap where additional seating could be installed.

(*Gallery of Singapore SportsHub / DPArchitects - 3*, n.d.)

3. Power supply
The Sports Hub has a robust and reliable power supply to support its various facilities, including lighting, audio-visual equipment, HVAC systems, and other electrical loads.
Solar power in addition to the grid power supply is used to support the immense amount of power required to support the sports hub.

Redundancy measures, such as backup generators, have been put in place to ensure uninterrupted power during outages.
The electrical systems are designed to meet safety standards and regulations.



SOCIAL CONTEXT

Bridging Community, Sports and Leisure– the Social Plinth
Providing the setting for the National Stadium and incorporating the OCBC Aquatic Centre and OCBC Arena, an active 'social plinth' is organised over three connected levels.
This contiguous, landscape plinth provides both a mix of community and other uses at human scale, integrating and unifying all other sporting, leisure, lifestyle, civic and community facilities.

(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

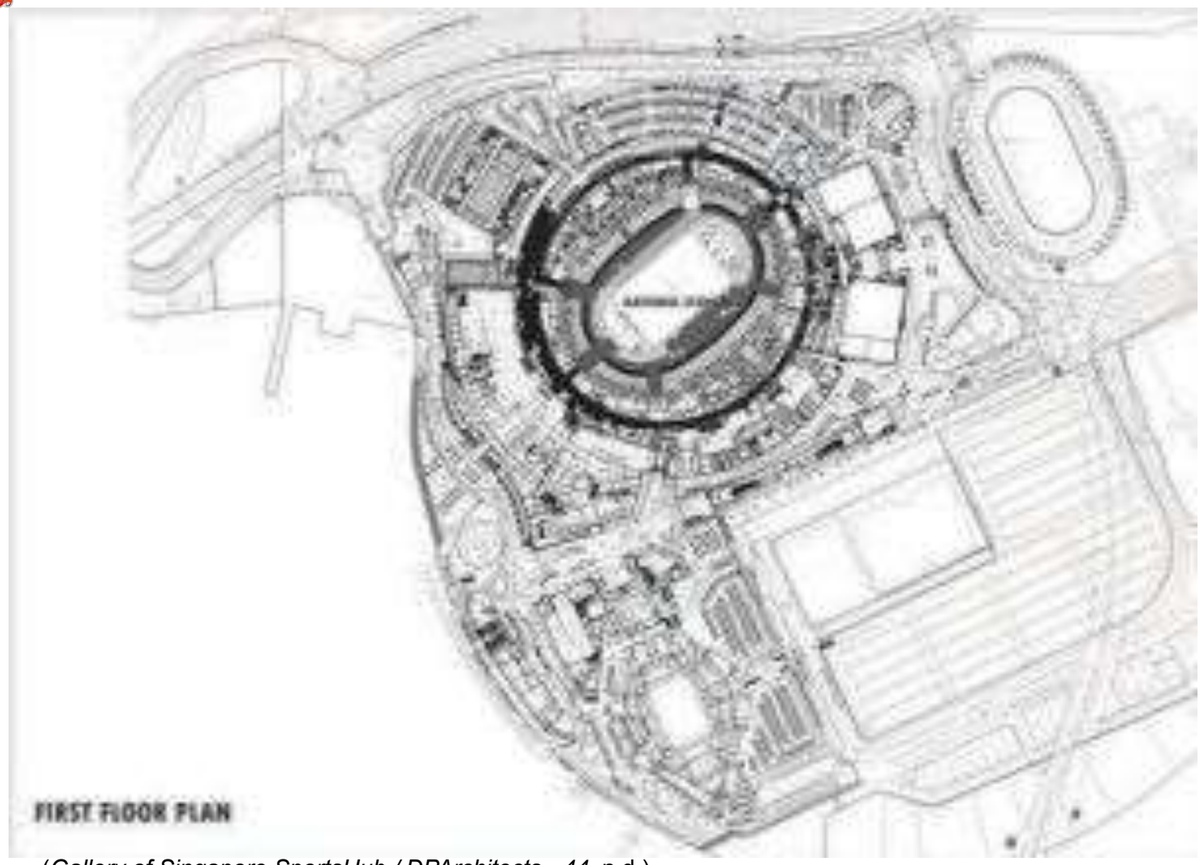
The 'social plinth' creates almost 2km of human scaled built form and landscape.
As a counterpoint to the monumental scale of the stadium, this plinth injects life and vibrancy between the various facilities and event plazas across the precinct.

(Singhal, 2016)

Site Plan

(*Singapore Sports Hub, Kallang - World Construction Network*, 2014)

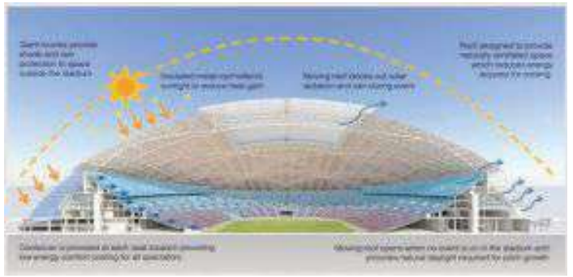
Perspective view



(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

CONCEPT & IDEAS
SUSTAINABILITY



(Upadhaya, 2023)

Designed with sustainability and legacy in mind, Singapore Sports Hub provides rich and meaningful experiences to inspire athletes, visitors and local community for generations to come.

Photovoltaic panels furnish an approximate 4,500 square meters of the National Stadium's exterior. They harness solar energy, which helps reduce the Singapore Sports Hub's energy consumption.

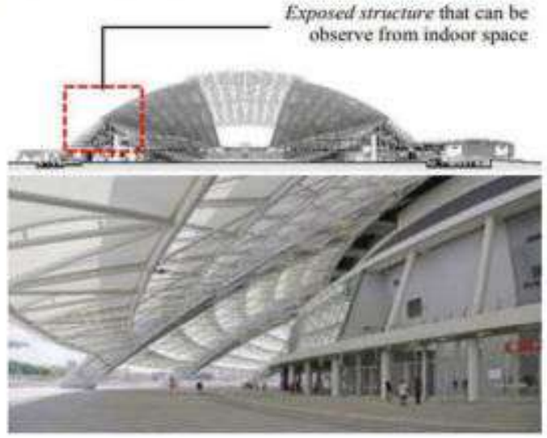
(Upadhaya, 2023)

(Upadhaya, 2023)

Stadium photovoltaic panels

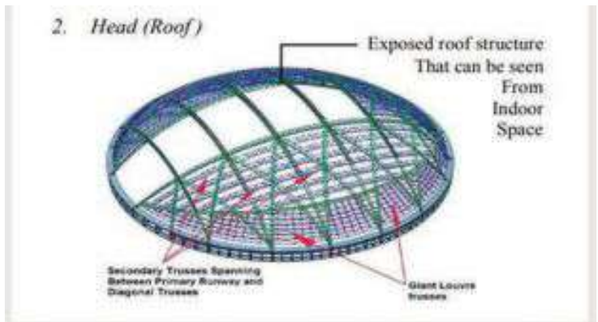
MATERIAL TECHNOLOGY

1. The Stadium
A state-of-the-art 55,000 seat sports venue, air-cooled for comfort and designed with a movable roof and retractable seating to support the widest range of sports.



stadium

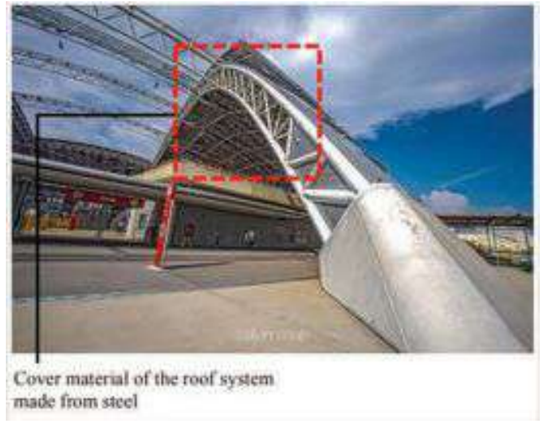
2. Structure
Emphasis on the structure that prioritizes the principle of 'Lightweight and Tensile Structure and Celebration of Process', divided to:
Body, the main body structure of Singapore Sports Hub used a conventional structural system, in the form of concrete construction to effectively hold tribune loads. The structure also serves as a partial deterrent to the roof construction.



(Lewis & King, 2014)

Head roof
The roof system using a space truss structure.
The structures arranged like a half-ball dome.
Thus, a wide enough distance can still be covered with lightweight and strong materials.

The roof construction requires strong and lightweight material and can represent the material of the future.
The use of the latest material refers to the principles of 'Transparent, Coating,



(Upadhaya, 2023)

steel roof cover material

3. Facade
The use of bright colors on the building façade uses primary colors (white) that are applied to the supporting structure and roof cover.
But, this color selections can complicate the observer to determine the parts of the building.
So that the application of the principle of 'Bright and Prevalent Coloring' is less effective in the building.

(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

SWOT ANALYSIS

Strengths:
- State-of-the-art facilities
- Multi-functional design
- Accessibility
- Sustainable features

Weaknesses:
- High operational costs
- Weather dependency
- Limited parking space

Opportunities:
- Hosting international events
- Collaborations with local organizations
- Diversification of events

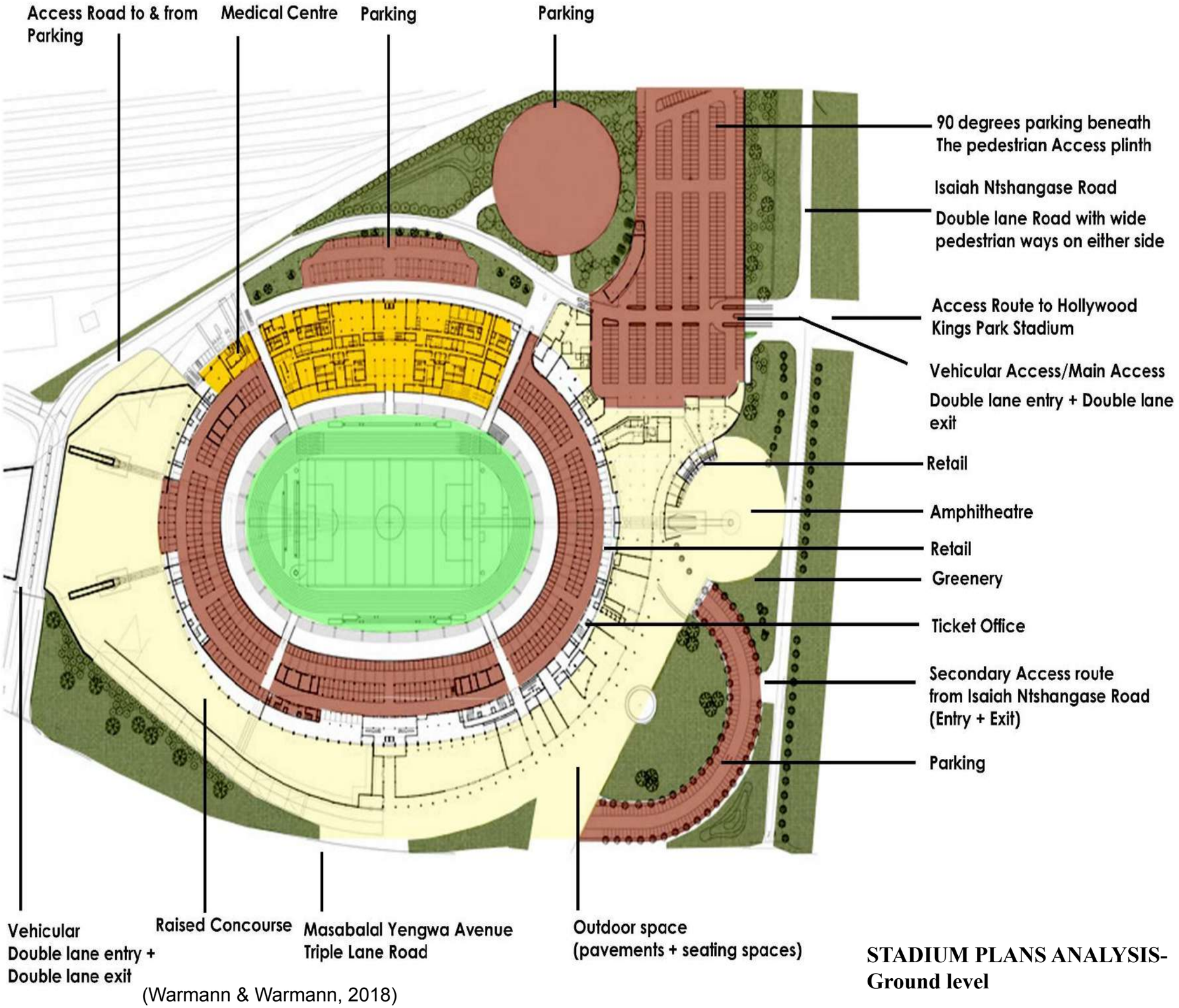
Threats:
- Competition from other venues:
- Economic downturns:
- Technological advancements:

LESSONS LEARNT

- Integrated design approach
- Smart technology integration
- Sustainable design principles
- Adaptive architecture
- Fan engagement and experience
- Resilience and redundancy
- Community involvement and input
- Continuous technological upgrades

CASE STUDY TWO:SOUTH AFRICAN REGION

MOSES MABHIDA STADIUM



(Warmann & Warmann, 2018)

STADIUM PLANS ANALYSIS- Ground level

CONSTRUCTION PROCESS

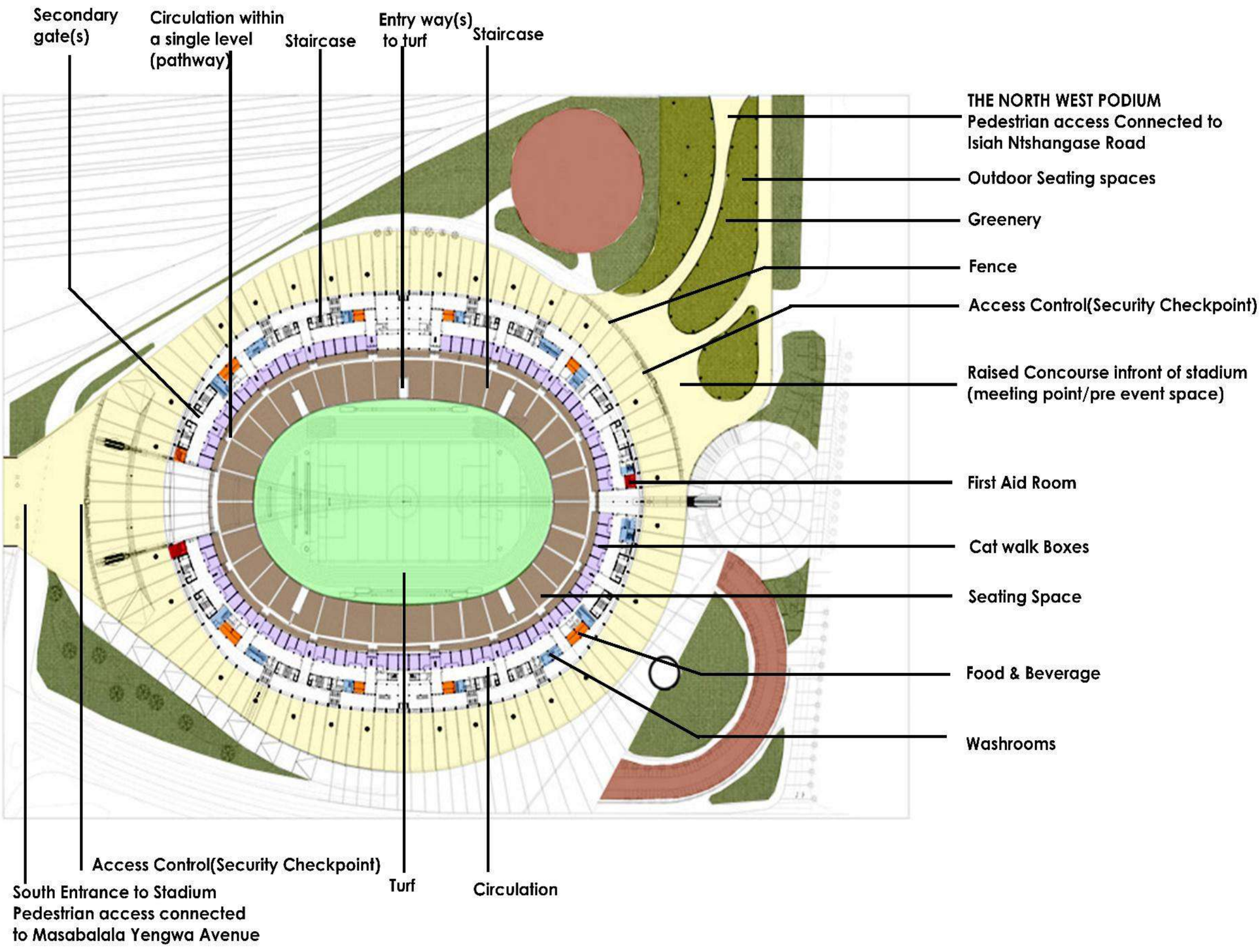
Foundation

On a saturated swamp-land blanketed with sea-sand. Thus, foundations were piled down to the bedrock 20m below ground level. Diaphragm walls were chosen due to its practicality and least time consuming.
Foundations are elongated rectangular boxes with 800mm thick reinforced concrete walls.
A reinforced concrete plinth is used to connect the arch to its foundation.

Arch

Consists of 56 elements, each having 8 reference points bolted into the arch.
The first 4 elements on each side were adjusted using hydraulic jacking systems before grouted onto the foundation.
Each stage had a set of coordinated points to define the arch geometry.
Before placing an element, the arch was lifted to a position, after the element was installed, re-measured to check that all criterias were achieved.
The connection of the arch to its foundation is facilitated through the application of a reinforced concrete plinth.

Process of Construction-Arch



(Warmann & Warmann, 2018)

STADIUM FLOOR PLAN ANALYSIS- 1st Level

Compression Ring and Façade

- The compression ring and facade are carried on steel columns connected to precast columns by welding a steel lug to the cast-in plate on the columns.
- The columns were adjusted using a temporary push-pull system.
- This also adjusted the compression ring once placed onto the columns.
- Measurements were done at night as heat affected the steel structure and adjustments were made prior in the morning.

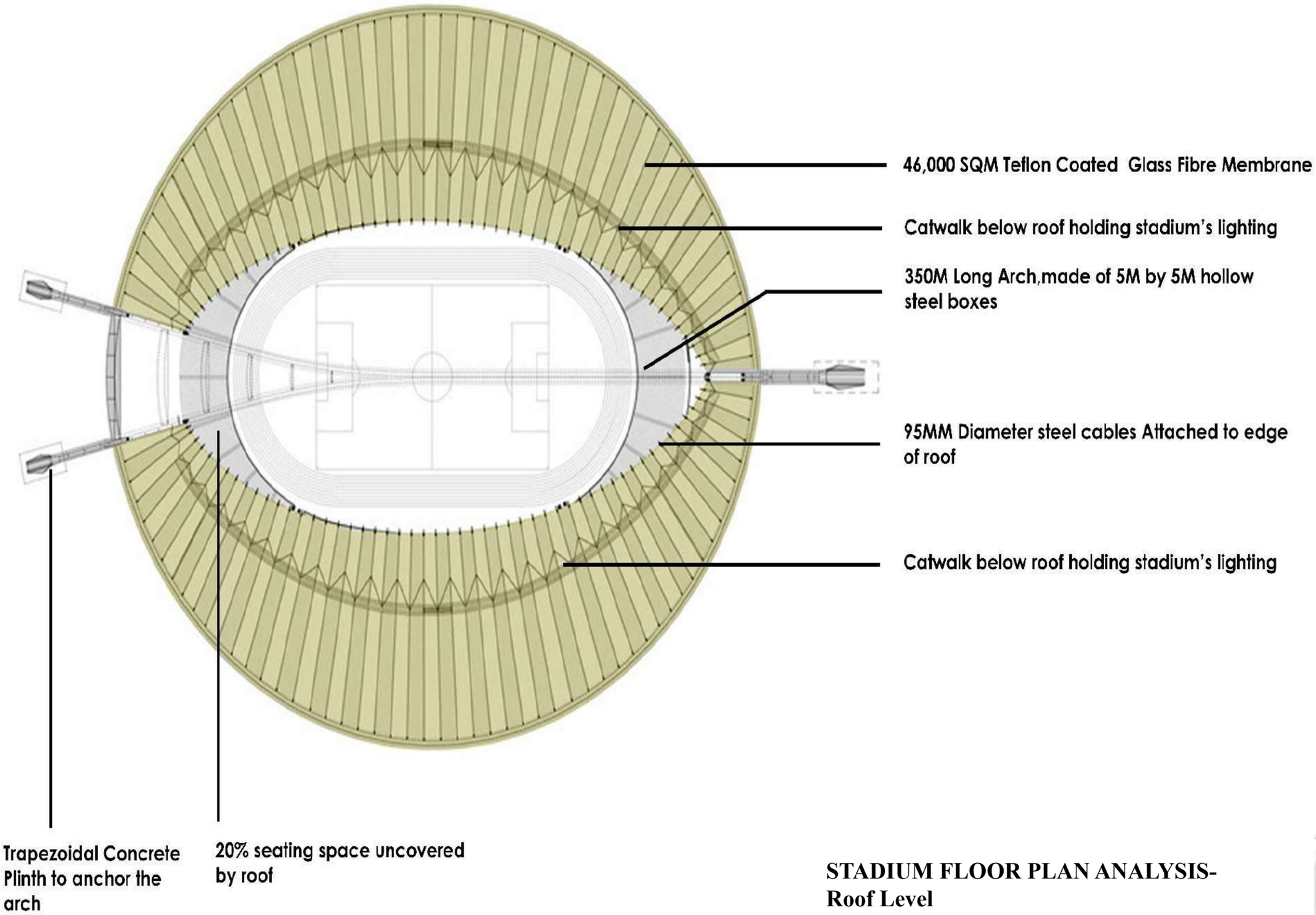
(Warmann & Warmann, 2018)

Process of Construction-Arch and hollow columns Completed

PTFE coated roof membrane After the cable net was installed. and prestressed, the membrane installation started by pulling the large PTFE panels off a roll supported at the horizontal arch.

(Warmann & Warmann, 2018)

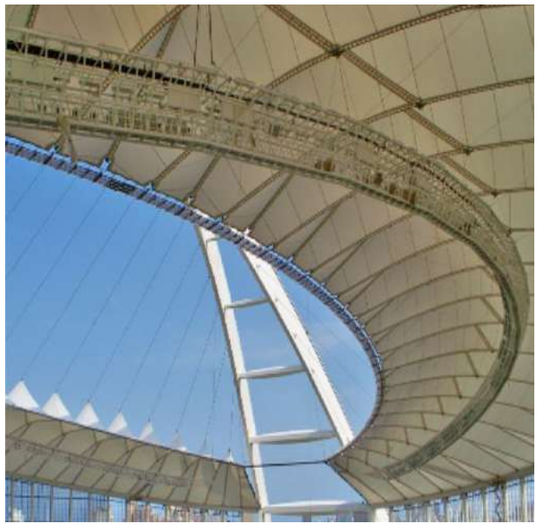
Process of Construction of cable connection to membrane



(Warmann & Warmann, 2018)

STADIUM FLOOR PLAN ANALYSIS- Roof Level

. The roof consists of a 46000 sqm of PTFE membranes. After securing. the panels in position, the membrane is tensioned towards the ridge and valley cable. The cables are connected by a steel cast item. The positions was carefully monitored during the lift to ensure the cable net was lifted evenly and none had been installed wrongly



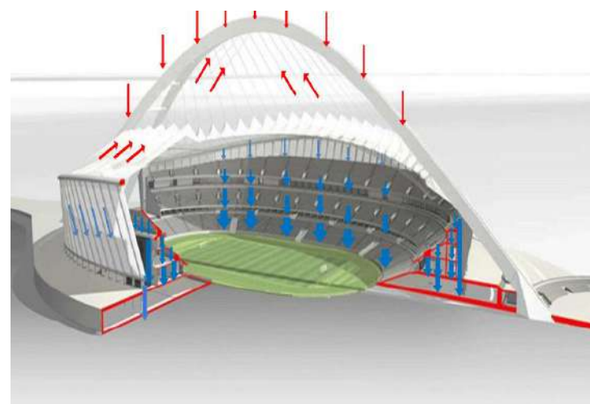
(Warmann & Warmann, 2018)

LOAD DISTRIBUTION DIAGRAM

-The shear cores provide lateral stability for each section of the stadium bowl.

-The thickness of the walls varies from 250 mm to 300 mm to obtain compatible deflections in the concrete structure at the interfaces with the roof structure at Level 6.

-The concrete structure provides lateral support to the arch at the north and south sides, whereas the reactions on the east and west sides are mainly axial loads. .

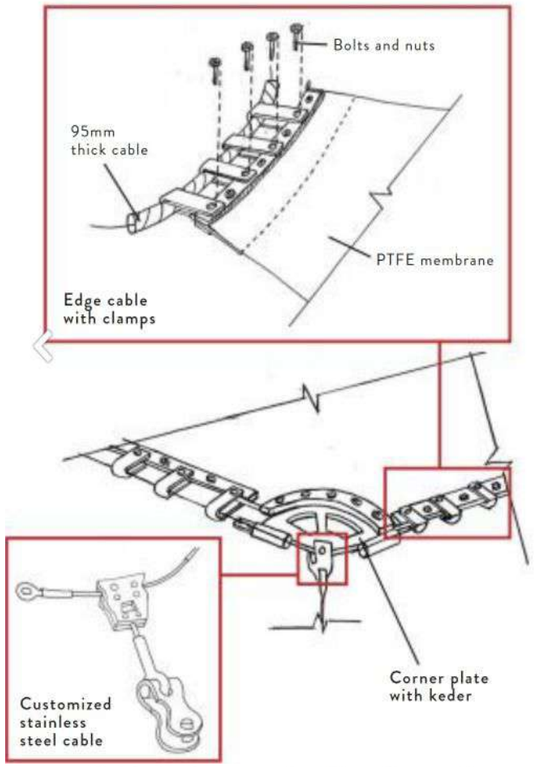


(Warmann & Warmann, 2018)

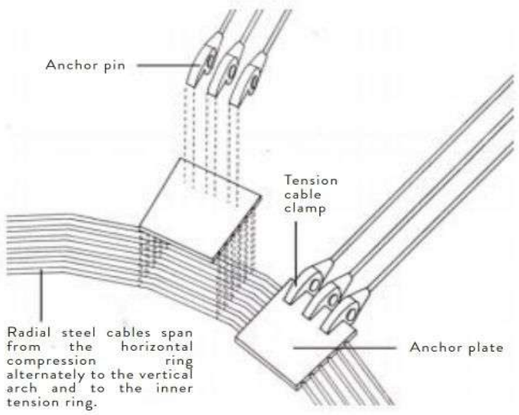
- The arch is connected by cable system to the external edges of the roof, carrying the weight of the roof's inner membrane. The arch is above all of these and helps suspend the cable network.
- All the components when connected to each other form the full roof structure.

CONSTRUCTION DETAILS

Cable to Cable and Fabric Connection



Cable to Compression Ring Connection



The Moses Mabhida Stadium required custom designed & built stainless steel cable clamps and rigging to complete part of the tensile roof structure.

CLIMATIC RESPONSE - RAIN PROTECTION

Of critical importance to the new stadium was to achieve a design that could

provide a guaranteed event schedule.The existing Kallang stadium (recently

demolished) was not able to provide this security as the majority of its seats

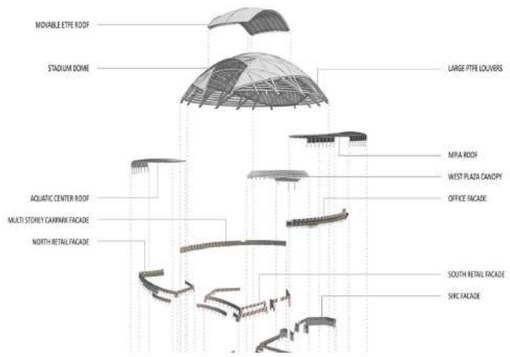
were uncovered. The national stadium roof achieves this objective in three ways

• a moving roof provides a fully covered arena

• the dome form of the roof is a natural form for shedding large quantities of water

• to the Sports Promenade giant PTFE louvers provide a rain protected access zone outside of the stadium ticket line with rain protected walkways linking to the adjacent MRT stations

DETAILED AXONOMETRIC DIAGRAM OF FACILITIES AT SINGAPORE SPORTSHUB



(*Gallery of Singapore SportsHub / DPArchitects - 44*, n.d.)

CLIMATIC RESPONSE - SOLAR SHADING

A significant part of the comfort criteria for spectators, required by the client

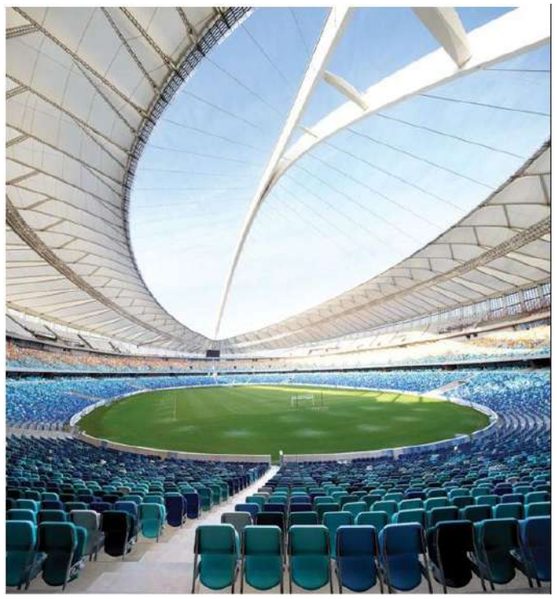
brief, will be achieved through the solar shading provided by the large dome

envelope. The comfort criteria achieved through

-The integration of a moving roof which provides a fully covered arena with all spectators gaining shade from the ETFE clad lightweight moving roof. The roof closes prior to an event to ensure that the concrete mass of the stadium bowl is not exposed to solar heat gain.

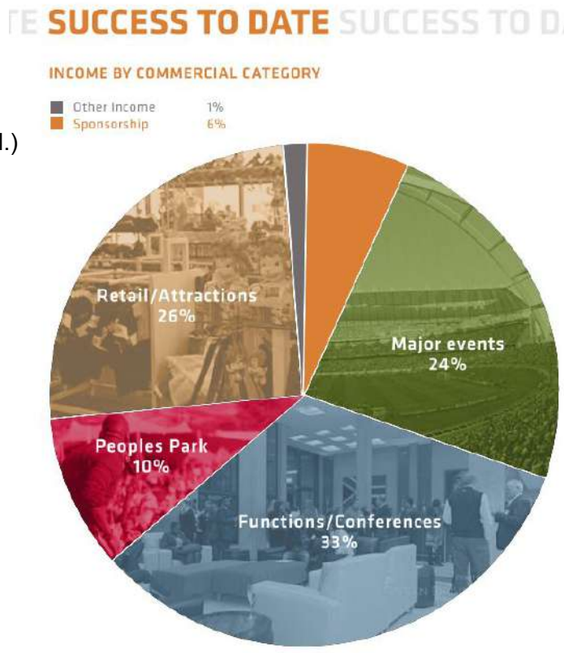
-The fixed roof cladding provides an insulated aluminium clad reflective surface which ensures that radiant heat affects are minimized

-The Sports Promenade giant PTFE louvers provide a sun shaded street whilst allowing for UV light to ensure plant growth to the internal elevation of the stadium

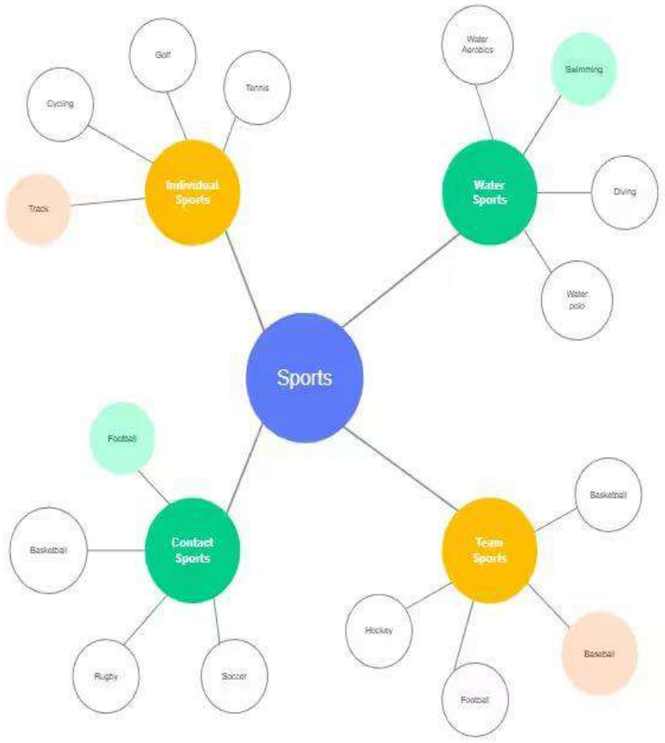


(Warmann & Warmann, 2018)

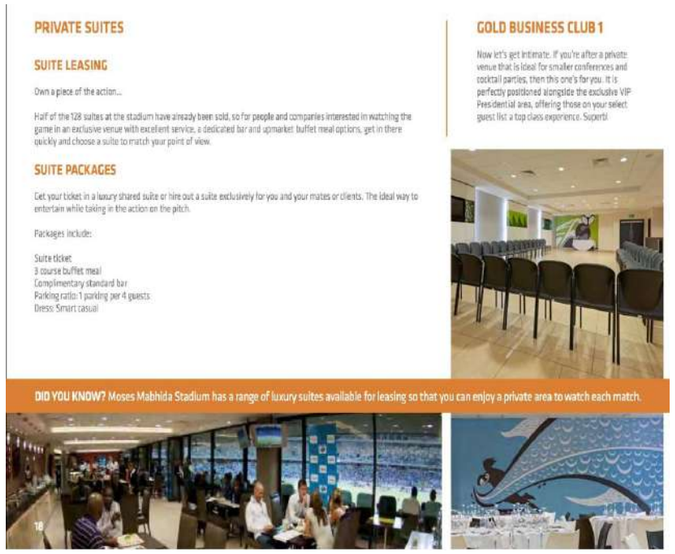
PROJECT SUCCESS



BUBBLE DIAGRAMS



SUITES AND HOSPITALITY



SUITES AND HOSPITALITY

GOLD BUSINESS CLUB 8 & 9

Really want to impress? Then take your guests to the most popular and exclusive venue at the stadium! It overlooks the pitch and takes in the full splendour of the 106-metre high arch. Frequented by celebrities and VIPs, it is the epitome of style and luxury.

MIXED ZONE

If you would like to host a conference, product launch or a big seated dinner, where better than this large area where players and media mingle before and after matches? It's located right in front of the players' tunnel that opens onto the pitch and is big enough to drive a new car or SUV in! Bet the camera flashes are going off already!

OCEAN ATRIUM

Whilst Moses Mabhida Stadium is a work of art in itself, it is also a patron of the arts and contains some of the most beautiful commissioned artworks by local artists in the country. Many of these works adorn the atrium, making it one of the most wonderful and inspiring venues at the stadium.

The Mixed Zone, located in front of the players' tunnel, is the stadium's biggest venue, accommodating up to 500 guests (optional: for theatre or cocktail functions).

PEOPLE'S PARK

People's Park hosted many corporates in the hospitality village during the FIFA World Cup and has since been used for Durban Day and as the finish venue for the annual Amashova Cycle Race and Spar Ladies Race with food stalls, hospitality, kids activities and lots of people picnicking and playing on the lawns.

PITCH

For the quintessential stadium experience, host your event where all the action happens: right on the pitch itself. With the iconic arch soaring above you and the grass under your feet, your function will really be the star attraction. So think big: what better way to celebrate a milestone than a banquet under the stars?

PRESIDENTIAL ATRIUM

A luxury glass-enclosed lounge area adorned with beautiful authentic African artworks - spacious, opulent and very impressive! Greet your guests as they make their grand entrance through the scenic glass lift and see their look of approval as they glance around the room.

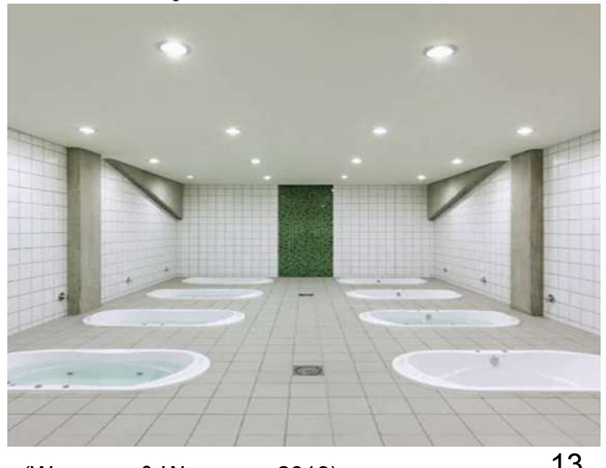
DID YOU KNOW? You can host your private event on the 2010 FIFA World Cup Pitch itself to make your occasion especially memorable.

SIZE AND CAPACITY DETERMINANTS

1. Main Stadium/Arena:
2. Indoor Arena:
3. Swimming Pool:
4. Tennis Courts:
5. Track and Field Facilities:
6. Gymnasium:
7. Fitness and Training Facilities:
8. Multi-Purpose Halls:

ENERGY SAVING STRATEGIES

- Natural lighting and a light-colored roof reduce energy demand, the shade provided by the roof ensures spectator comfort.
- Energy-efficient luminaires, and associated lamps and control gear, are specified as well as T5 lighting and electronic ballasts for floodlights LED technology and timing controls for feature lighting.
- Centralized chiller air-conditioning systems minimize.
- Heat pumps for heating water.
- Wash-hand basins in restrooms do not have hot-water taps.
- Gas rather than electricity in kiosks and kitchens.
- Equipment and systems carefully controlled to enable localized switching on and off of lights while mechanical system loads are reduced by variable speed drives and soft starts on motors.
- Central control room housing the BMS, which enables accurate measurement of energy consumption.



(Warmann & Warmann, 2018)

1.

B. COMMERCIAL CENTRES

The objective here is to feature well analysed international, award winning precedents of Commercial Centres architectural design projects and in their analysis that emphasises on concepts and technical considerations

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

Akinyi Odhiambo
Angaya Derrick
Blessing Ndehi
Gathu Juma
Joan Nzesya
Kere Monna
Matara Mshindi
Muua Mumo
Nelson Mburu
Nyabuta Kennedy
Phyllis Wang'ombe
Ramadhan Haji

CASE STUDY ONE
E.A.C AND HORN OF AFRICA REGION
LIDETA MERCATO

Exterior perspective, archello.com, Feb 27, 2019

Location: Addis Ababa

Architects: Vilalta Studio

Area: 14200 m²

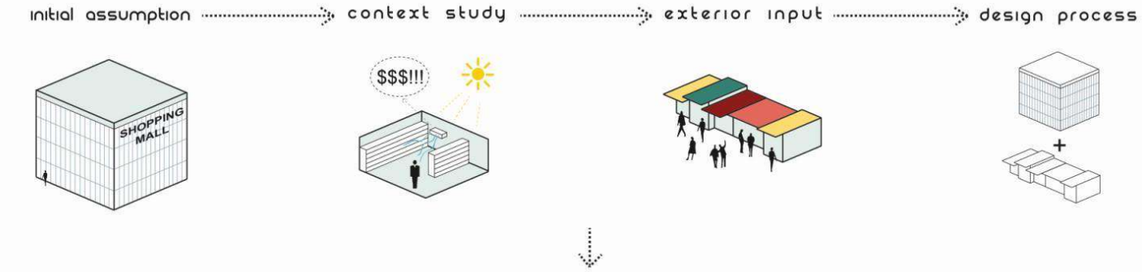
Year: 2016

Circulation and atrium, archdaily.com, Dec 7, 2014

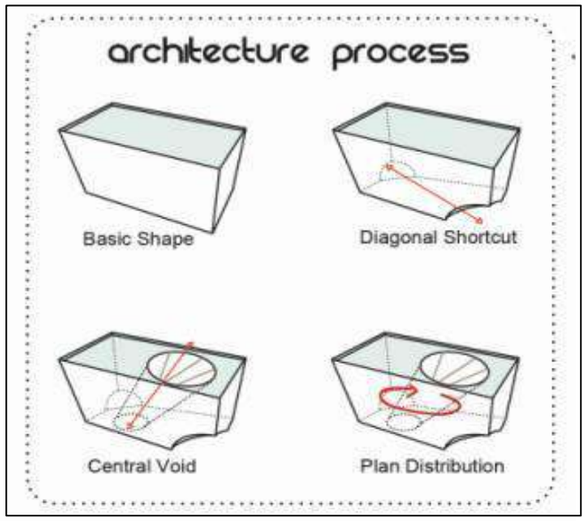
Data References

1. Mercato published on Gibbs College of Architecture - Vilalta Studio
2. Reisende Architekten mit Koffern voller Bücher Prof. Dr.-Ing. Natascha Meuser
3. Lideta Mercato published on DW News - Vilalta Studio
4. Gallery of Lideta Market / Vilalta Studio - 26, ArchDaily
5. Lideta Market by Vilalta Arquitectura - aasarchitecture
6. Lideta Mercato: a UNESCO medal for Vilalta Architects |

FORM DEVELOPMENT



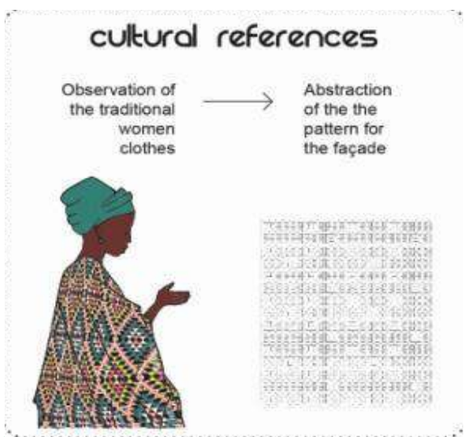
The structure was conceptualised from the Old Mercato that was an open air market. The individual structures in the Old Mercato stalls inspired the New Lideta Mercato.



Conceptualisation

The project was aimed at replacing the big shops in conventional malls that were costly to operate with small stalls that replicate the old market.

Social and Cultural Aspects



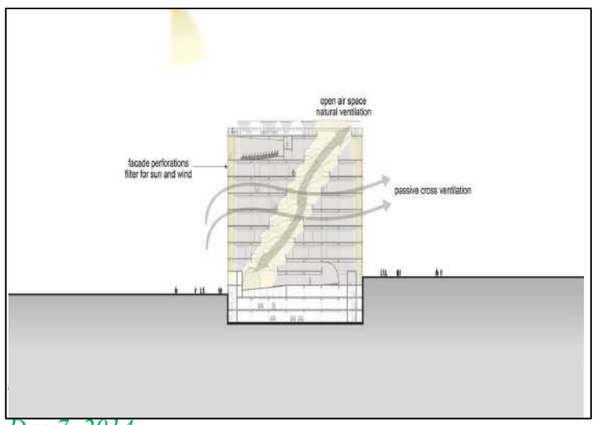
Abstraction from female traditional clothing

The traditional design patterns on fabrics used in Ethiopia inspired the design of a culturally appropriate facade on the Mercato. The facade was conceptualised to help reduce thermal heat that is experienced in ethiopia's weather and made malls hard to operate in.

BUILDING SERVICES

Natural lighting is enabled through the atrium in the middle of the building. The openings on the facade help to allow light and internal thermal regulation.

Passive cross ventilation is enabled through the punctures in the facades.



Dec 7, 2014

The building's skin, designed to control natural light, could play a significant role.

Facade openings, ethiopiaforums.com, Feb 1, 2017

The interior is made thermally comfortable by using a prefabricated lightweight concrete system for the façade. The concrete is perforated in a fractal pattern that resembles the ones found on Ethiopian women's traditional dresses.

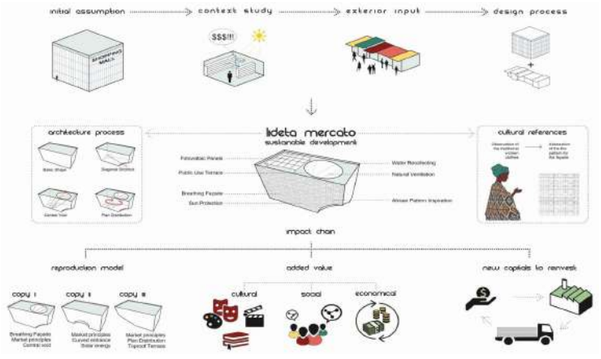
Perforated concrete pattern, bmktcn.com, Jan 15, 2018

Interior lighting, archidatum.com, Mar 7, 2017

It was, also, inspired by, the ethno-mathematician, Ron Eglash's idea on how fractals are "the heart of African design." That design of the façade minimizes heat transmission inside the building and controls both lighting and ventilation.

SUSTAINABILITY

Frequent power outages in the country made use of solar panels to be a worthwhile investment . The roof top is covered with solar panels that generate electricity for the establishment.
Grey water filtration and rain water harvesting helps in water conservation in the establishment.



Conceptualisation process, archidatum.com, Jan 31, 2017

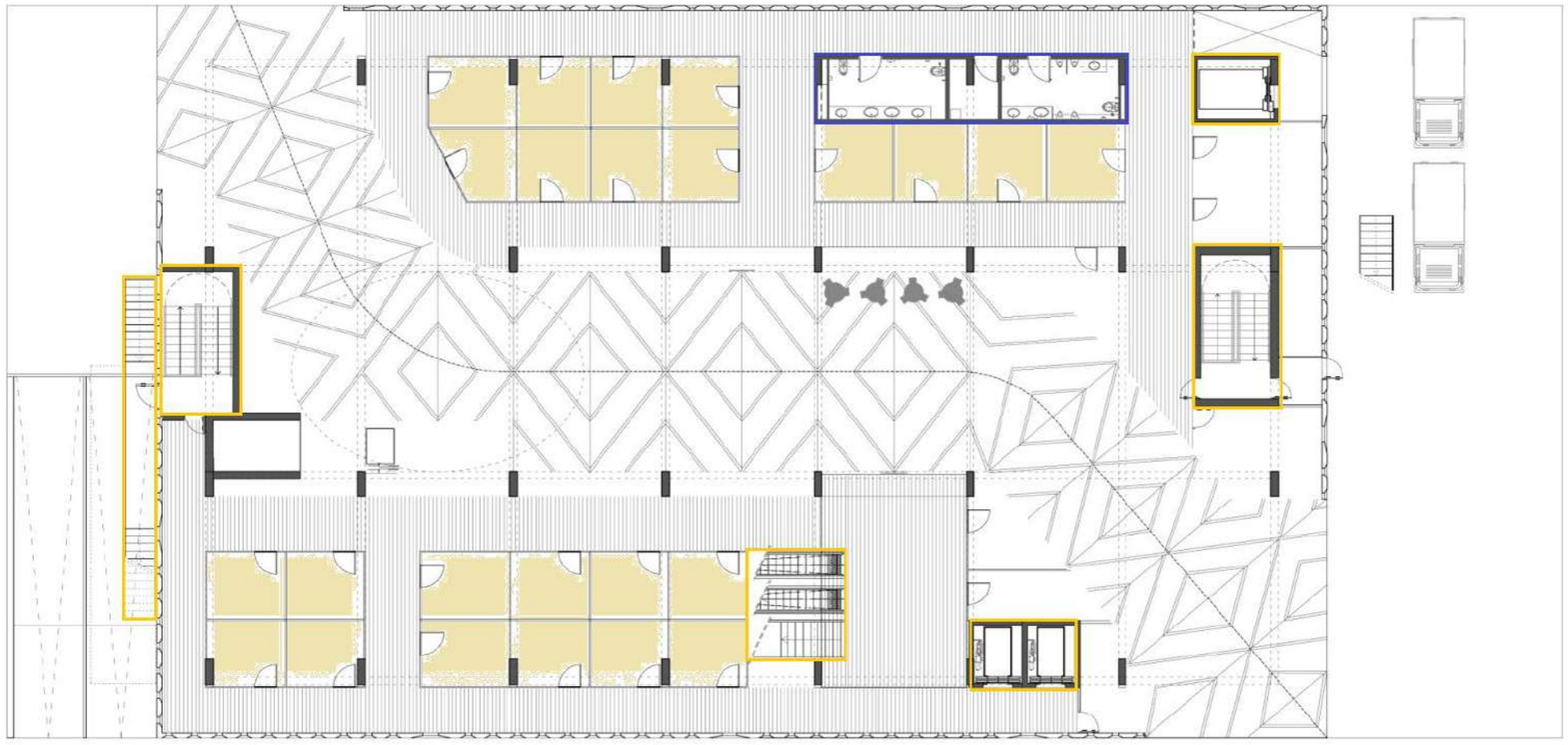
Analysis of levels

Ground Floor Level

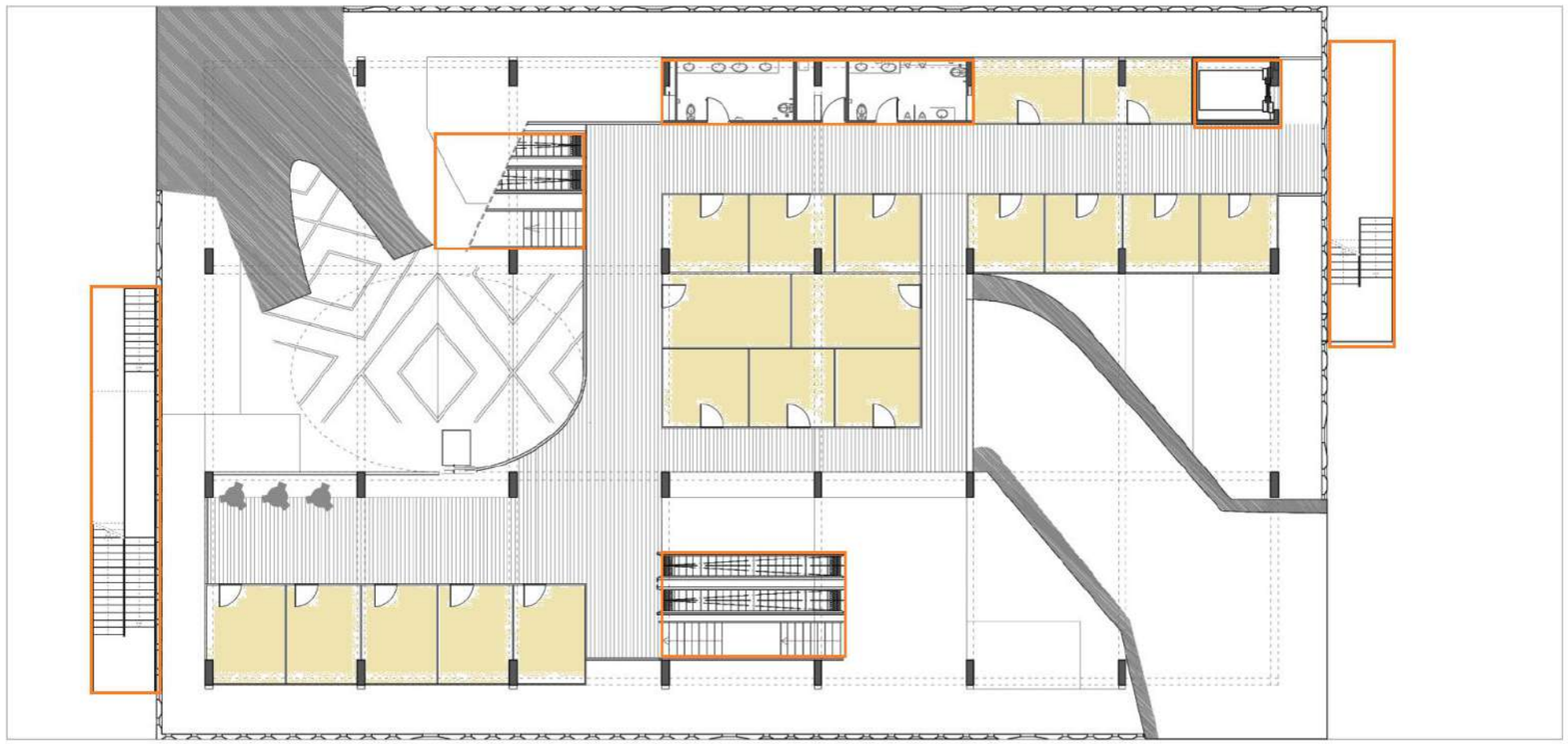
The diagonal path is introduced inside the building to connect the two parallel streets that act as the boundary of the site. This created a public space inside the building and also drew people into the mercato hence increasing the footfall.

First Floor level

The first floor features an array of small shops and boutiques offering clothing, accessories, and local crafts. Visitors can also enjoy a food court with diverse culinary options and relax in cozy cafés. Entertainment areas, such as game arcades or live performances, add to the vibrant atmosphere.



Ground Floor Plan, archdaily.com, Gallery of Lideta Market



First Floor Plan, archdaily.com, Gallery of Lideta Market

Third Floor Level
An inclined atrium runs through the building, allowing natural light to filter down and creating a dynamic experience for shoppers Features a selection of unique shops and boutiques offering fashion, accessories,and local crafts.

Seventh Floor Level

The 7th floor continues the design language of the lower levels. It features an open layout with interconnected spaces. Small shops, boutiques, and auditorium halls, which are the outstanding activities on this level.

Roof Top Level
Features circular photovoltaic umbrellas providing shaded entertainment areas while also serving as energy sources. Additionally, a rainwater collection system efficiently drains water into basement tanks for reuse, reducing consumption and operational costs.

In summary, the rooftop of Lideta Mercato combines practicality, energy efficiency, and a pleasant outdoor experience.

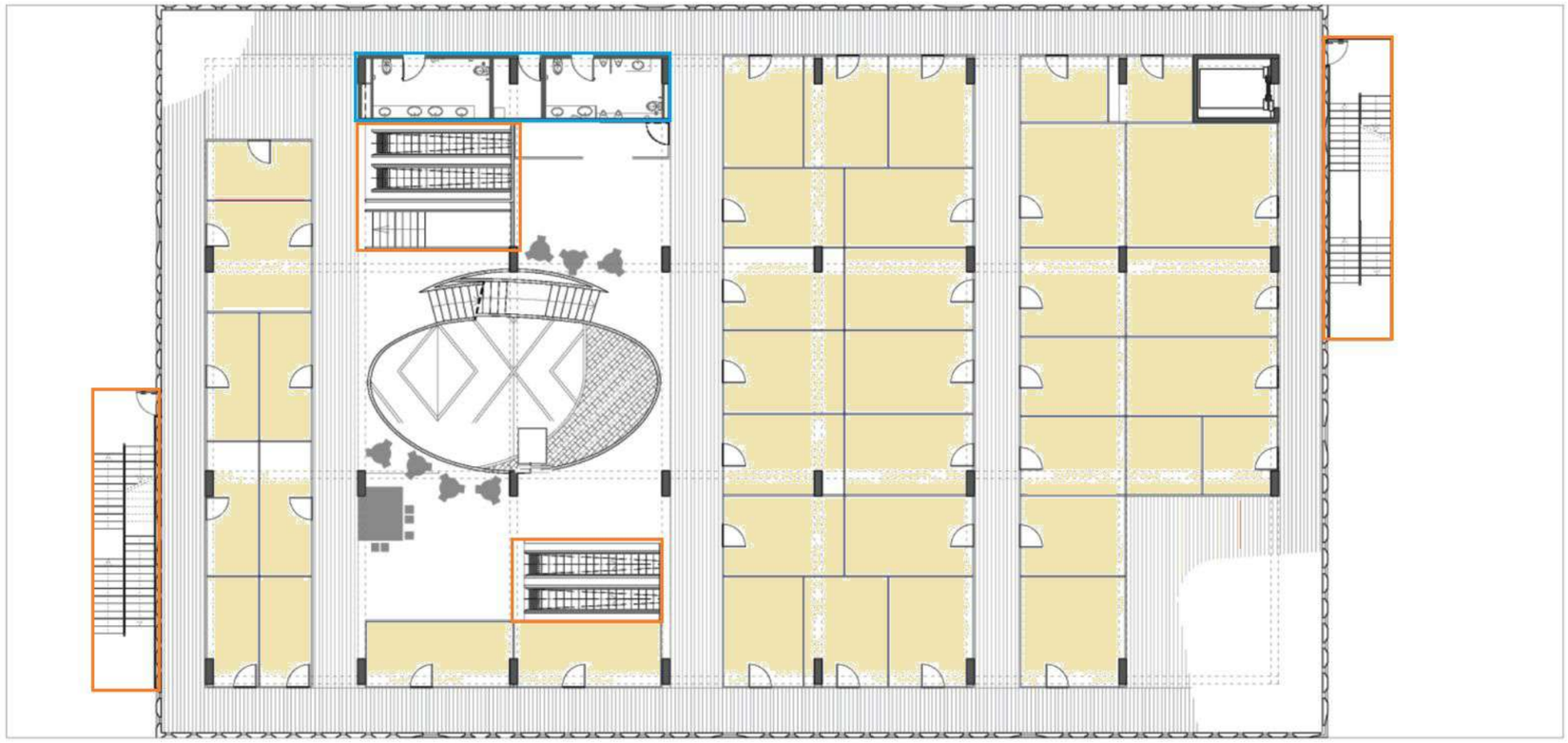
How useful it this

Energy Generation: The photovoltaic panels harness solar energy, converting it into electricity. This renewable energy source contributes to the building's power supply, reducing reliance on external grids.

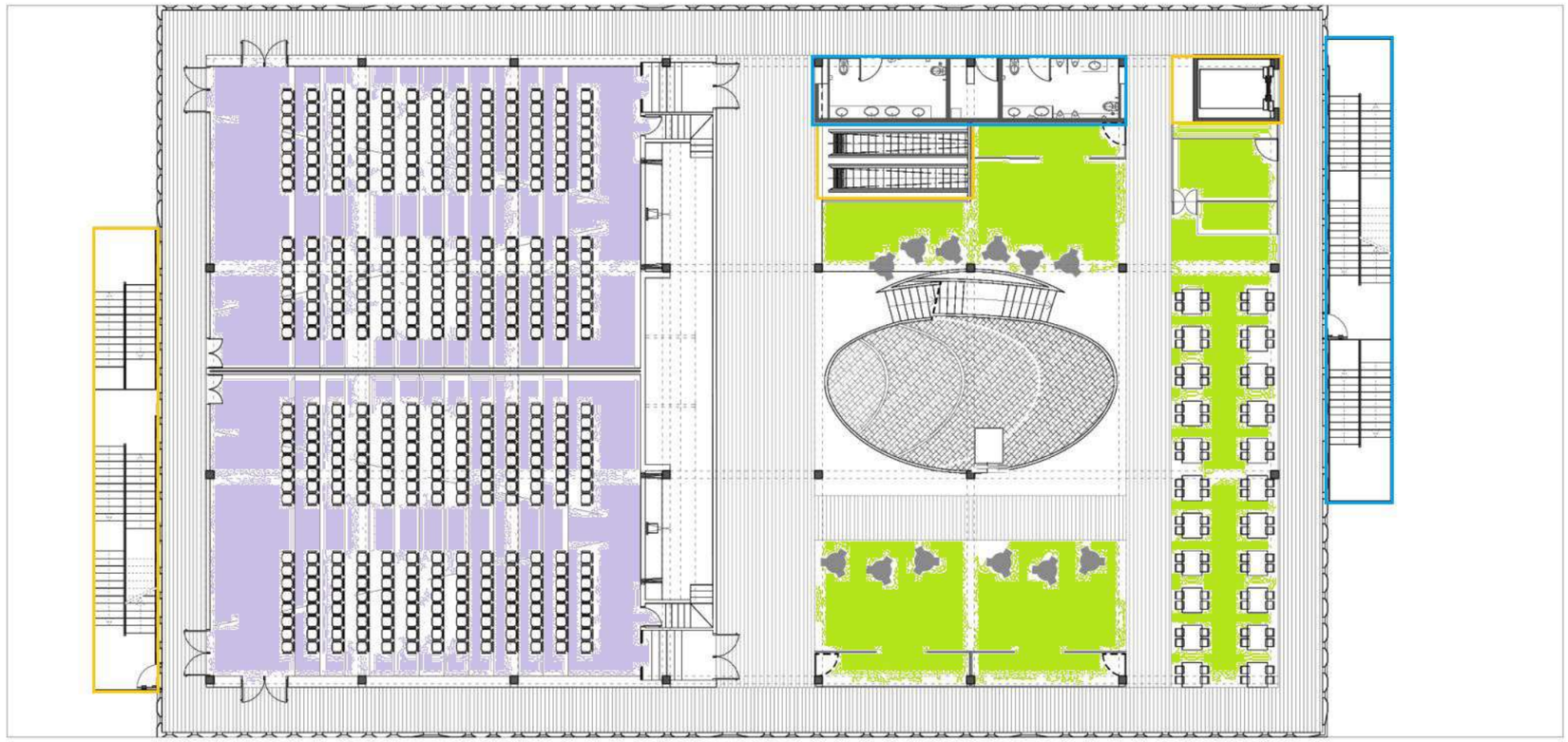
Shading and Comfort: Besides generating energy, the umbrellas provide well-shaded entertainment areas for visitors. Their design ensures a comfortable outdoor experience while maximizing sustainability.

LEGEND

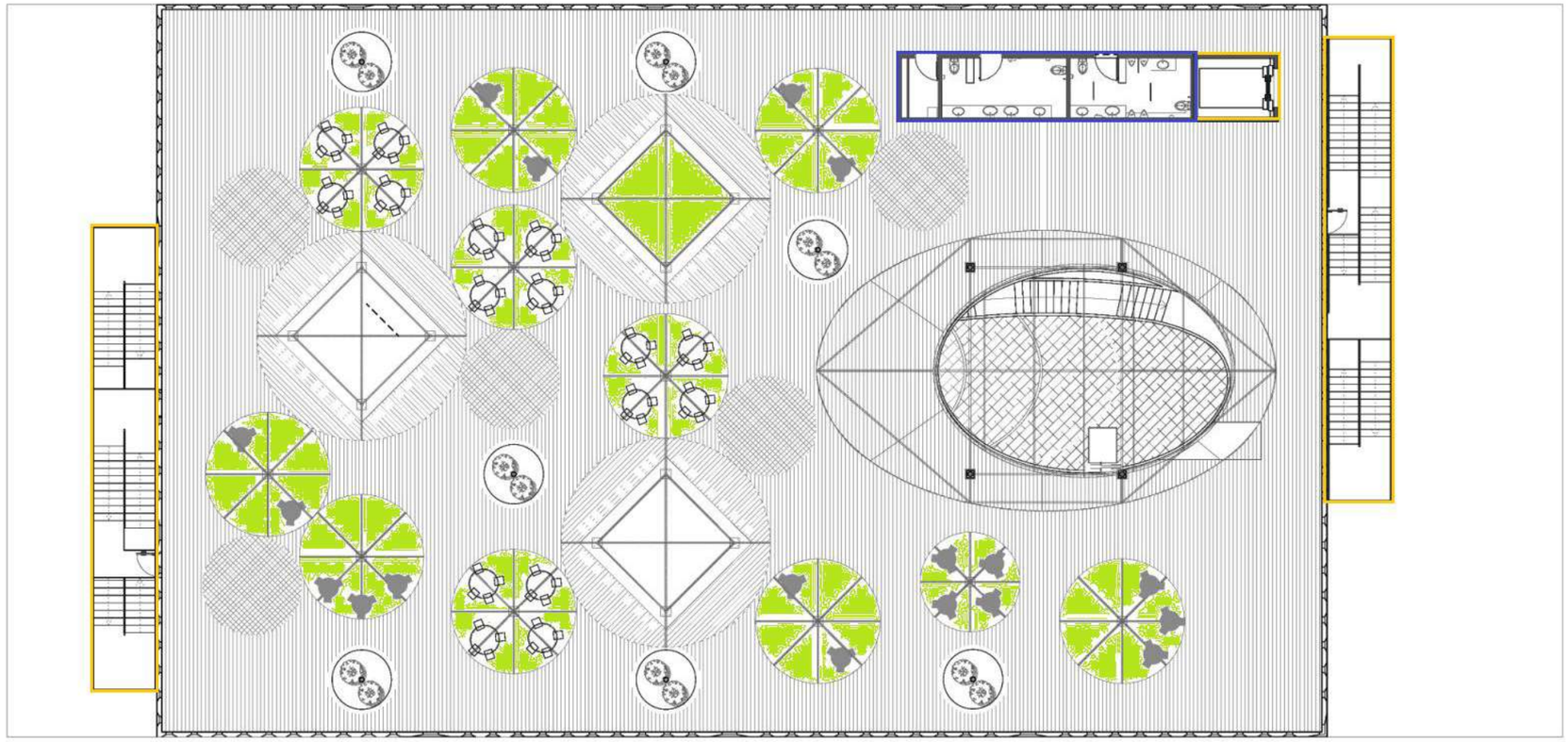
- Wet Areas
- Vertical Circulation
- Food courts
- Circulation Zones
- Auditorium Halls



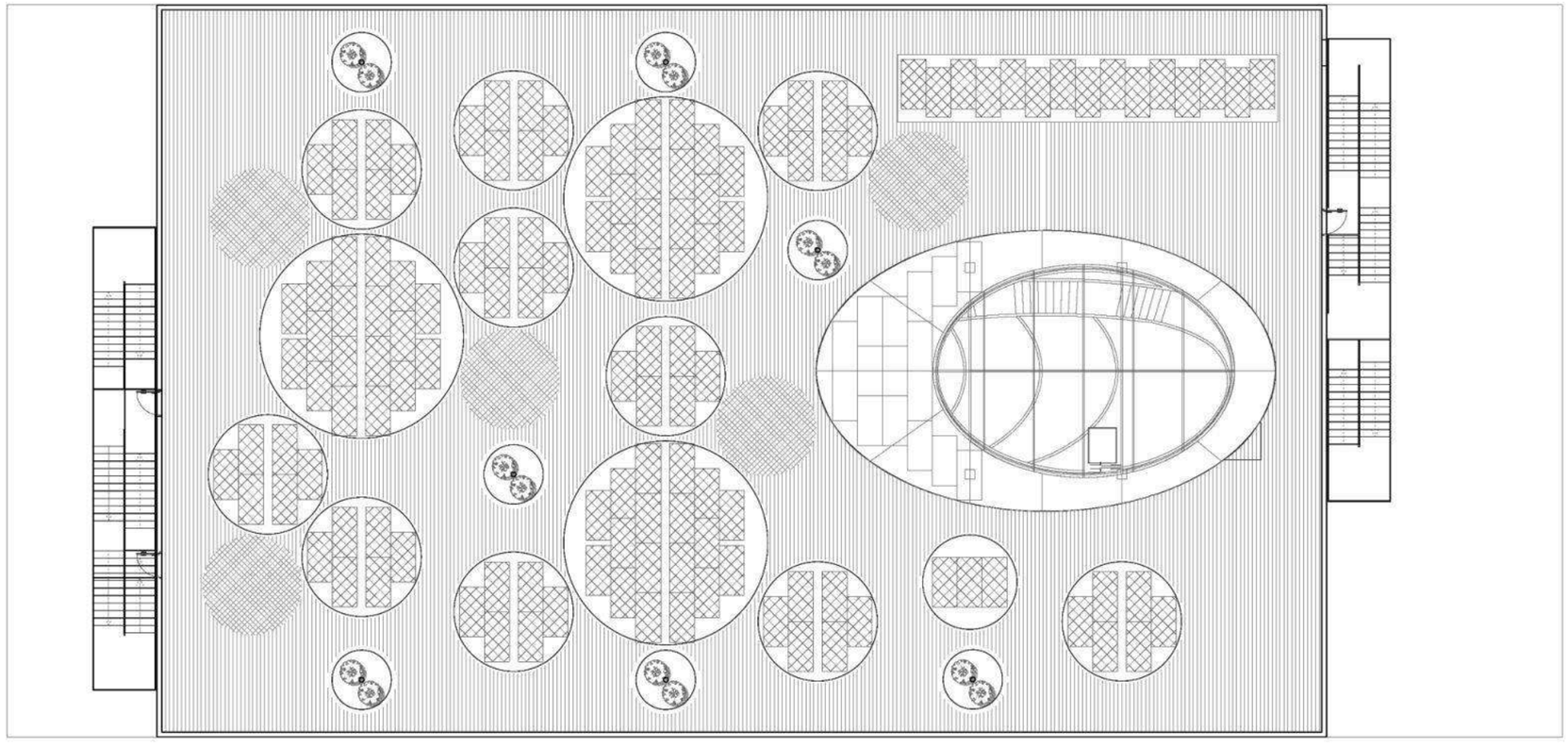
Third Floor Plan, archdaily.com, Gallery of Lideta Market



Seventh Floor Plan, archdaily.com, Gallery of Lideta Market



Rooftop Plan, archdaily.com, Gallery of Lideta Market



During construction, vilalta-architects.com, Dec 2, 2019

The construction process of Lideta Mercato in Addis Ababa, Ethiopia, involved several innovative steps. Architect Xavier Vilalta drew inspiration from the Old Mercato, creating a multi storey contemporary market with an inclined atrium running through the building.

Lightweight concrete prefab panels formed the climate-responsive façade, featuring a traditional Ethiopian fractal pattern. Circular photovoltaic umbrellas on the rooftop serve as energy sources and shaded areas, while rainwater collected on the roof is reused for toilets.

CASE STUDY TWO: SOUTH AFRICAN REGION
MALL OF AFRICA

Aerial view of Mall of Africa, joburg.org.za, Apr 22, 2016

GENERAL INFORMATION

Architects: MDS Architects

Area: 130,000m^2

Year of completion: 28th April 2016

Client: Attacq, Atterbury Property Holdings

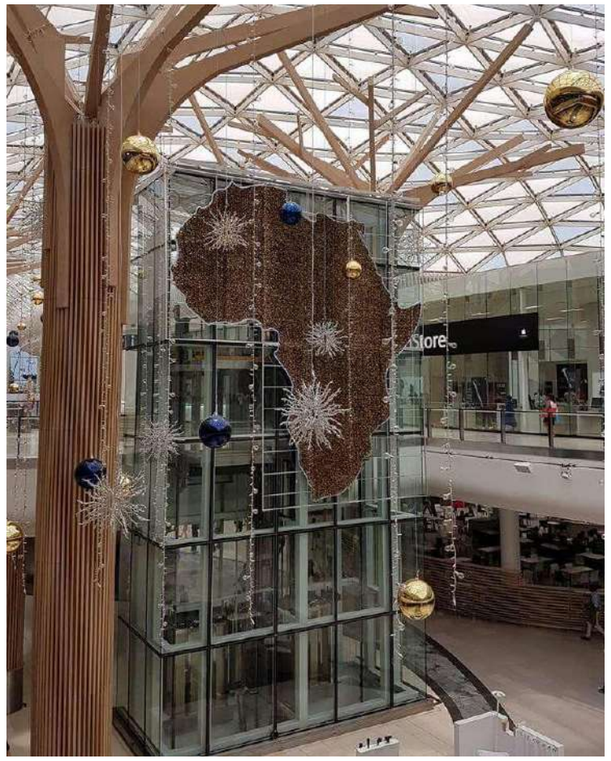
Location: South Africa (in Waterfall City, Midrand – midway between Johannesburg and Pretoria.)

FIGURES AND DATA REFERENCES

1. Potential for Malls in Africa grows - Synergy Real Property
2. Mall of Africa - The largest mall in Africa - Johannesburg South Africa, Pinterest
3. MALL OF AFRICA| RETAIL| WBHO
4. MDS Architecture| Projects

DESIGN CONCEPT

The design process was led by MDS Architecture to fulfil the client's desire to provide not just a mall in Africa but 'the' Mall in Africa, something of greatness on the African continent.



Mall of Africa, Pinterest, The largest mall in Africa

The design inspiration for the mall and the courts was drawn from the geological beauty of the continent of Africa. This formed the direction of the design and the inspiration for the mall interior, aesthetics and finishes was developed on this concept in a non-stylised manner.

ACCESS AND CIRCULATION

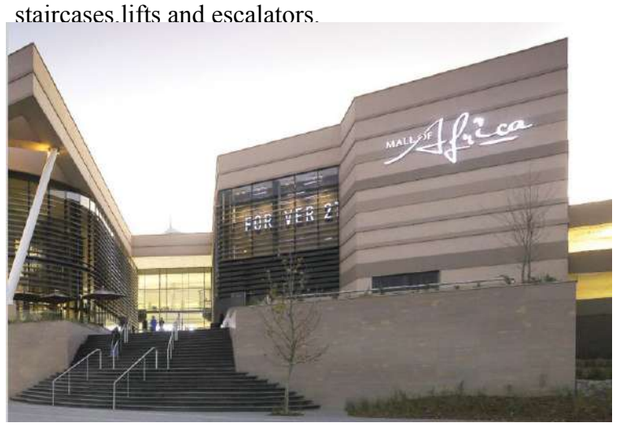
Map showing access to mall, Google Maps

The mall is well serviced with different roads all around making navigation easier for the massive number of visitors.

Pathway to entrance, ceragran.co.za, Aug 30, 2019

The mall boasts an outstanding 26 entrances. The entrances provide adequate isle sizes to accommodate the large number of visitors. Due to the shear size of the mall, circulation was one of the most crucial elements.

The mall provides large enough corridors,elegant staircases,lifts and escalators.

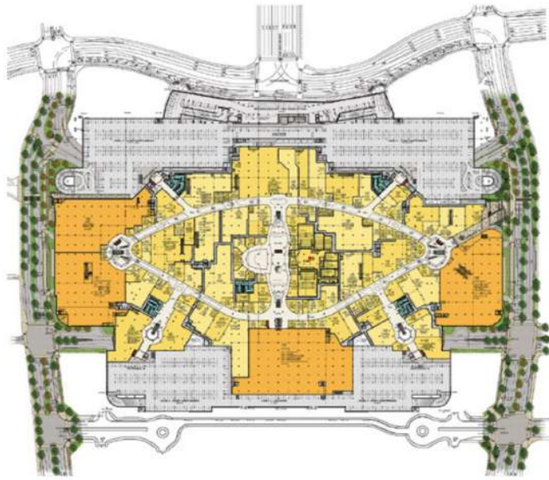


Staircase at entrance, ceragran.co.za, Aug 30, 2019

6 parking levels have been provided with the third level having both shopping spaces and parking. All four sections of the mall are connected with extensive circulation wide enough to accommodate the large number of users.

The mall offers convenient and contactless shopping experience with free parking for the first two hours.

Once at the various parking entrances, one pays for parking with Admyt or Eezi parking app solutions. Then, one is given a parking ticket and barriers are automatically drawn down for access.



LEVEL 3 - LOWER LEVEL SHOPPING & PARKADES

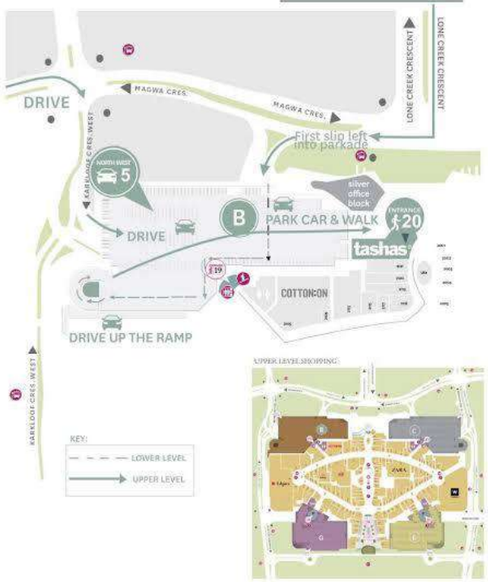
Source: Atterbury| Mall of Africa

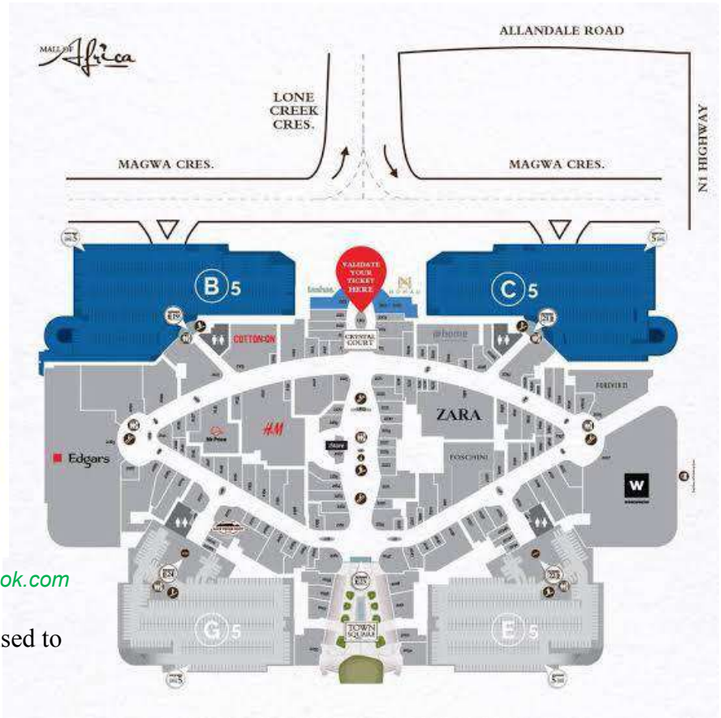
The different parking sections are coded by numbered letters and are used based on section of the mall one

Images showing outdoor paving, interior landscaping and circulation, ceragran.co.za, Aug 30, 2019

WAYFINDING

Images provided for wayfinding and seamless parking at Mall of Africa page, facebook.com





Routes provided by the Mall of Africa page, facebook.com

Before accessing the mall, individuals are advised to plan their visit from the Mall of Africa official website.
The website provides a layout of the stalls within the mall and the entrances convenient to use for their access.

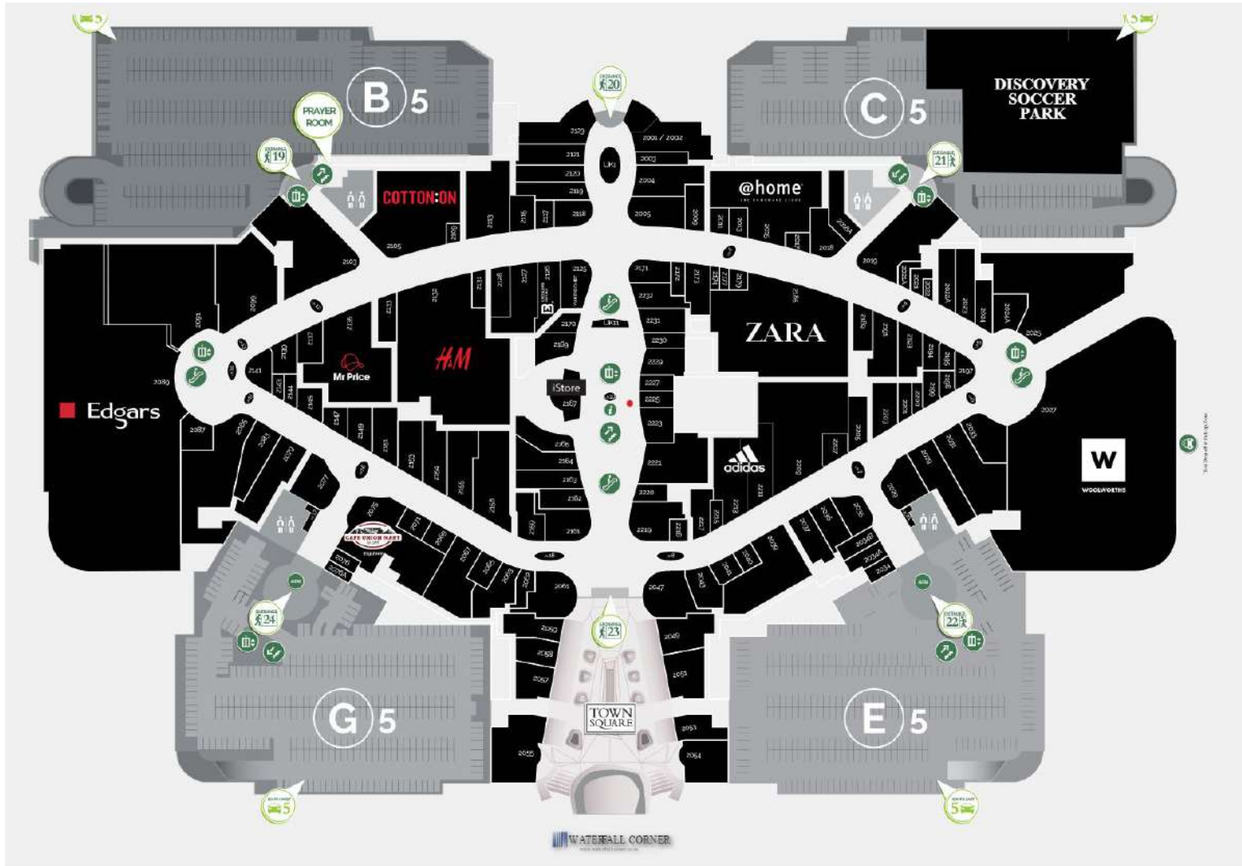
The website features a dedicated section with the latest news, promotions, exhibitions, and exciting happenings.

Context with mall access, Mall of Africa page, facebook.com

Whether it's book launches, kids' clubs, or thrilling film screenings, the website keeps visitors informed about the extraordinary experiences awaiting them at Mall of Africa

Mall of Africa prioritizes visitor convenience with efficient wayfinding solutions. Here's how they make navigation a breeze:

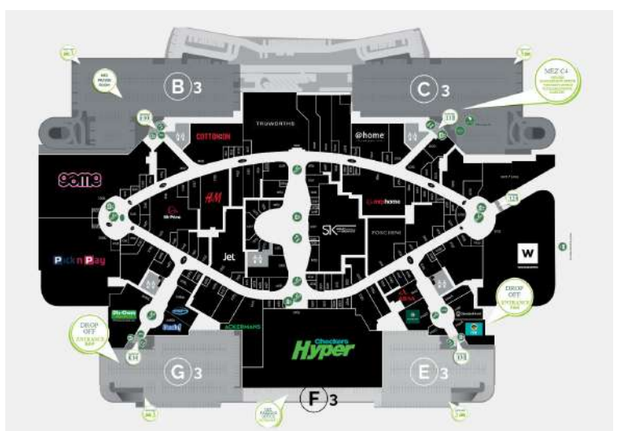
Ample Signage: Clear and strategically placed signs guide visitors to different sections, stores, and facilities within the mall.



Digital Maps: The Mall of Africa website provides interactive maps, allowing visitors to explore and plan their routes before arriving.

Wide Walkways: The mall's spacious walkways ensure smooth movement, even during peak hours.

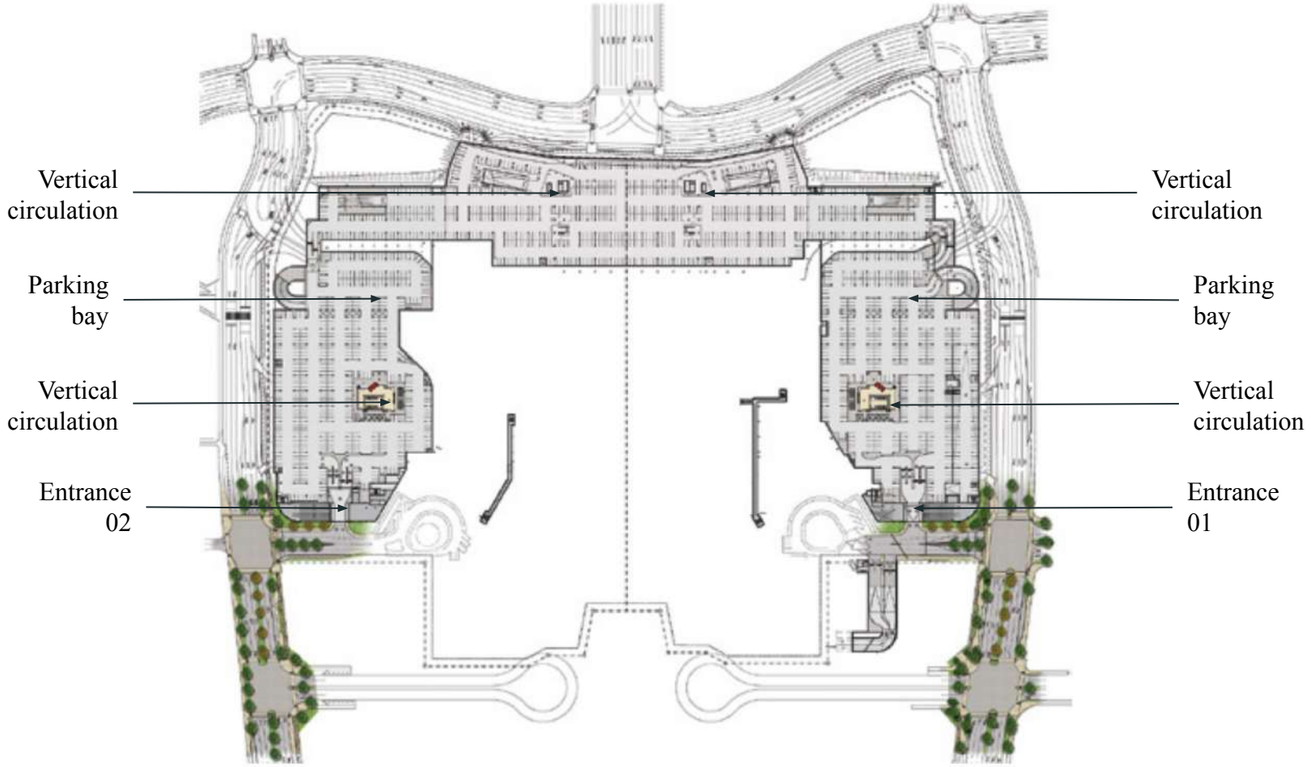
Natural Light: Abundant natural light enhances visibility and creates a pleasant shopping experience.



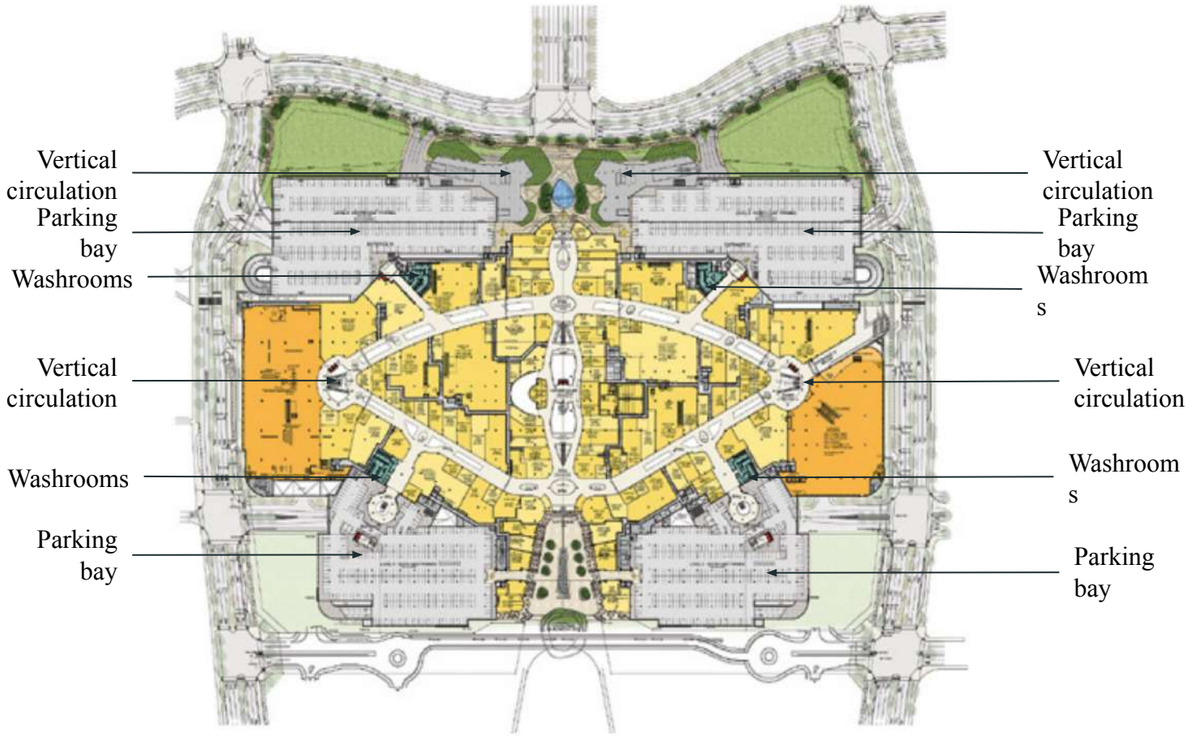
Mall of Africa exudes luxury through its exceptional design, upscale offerings, and captivating ambiance. With over 300 stores, including premium brands and unique boutiques, it caters to discerning shoppers. The spacious layout, abundant natural light, and diverse dining spots create an indulgent experience.

Plus, state-of-the-art movie theaters, including IMAX and 3D options, add to the allure.

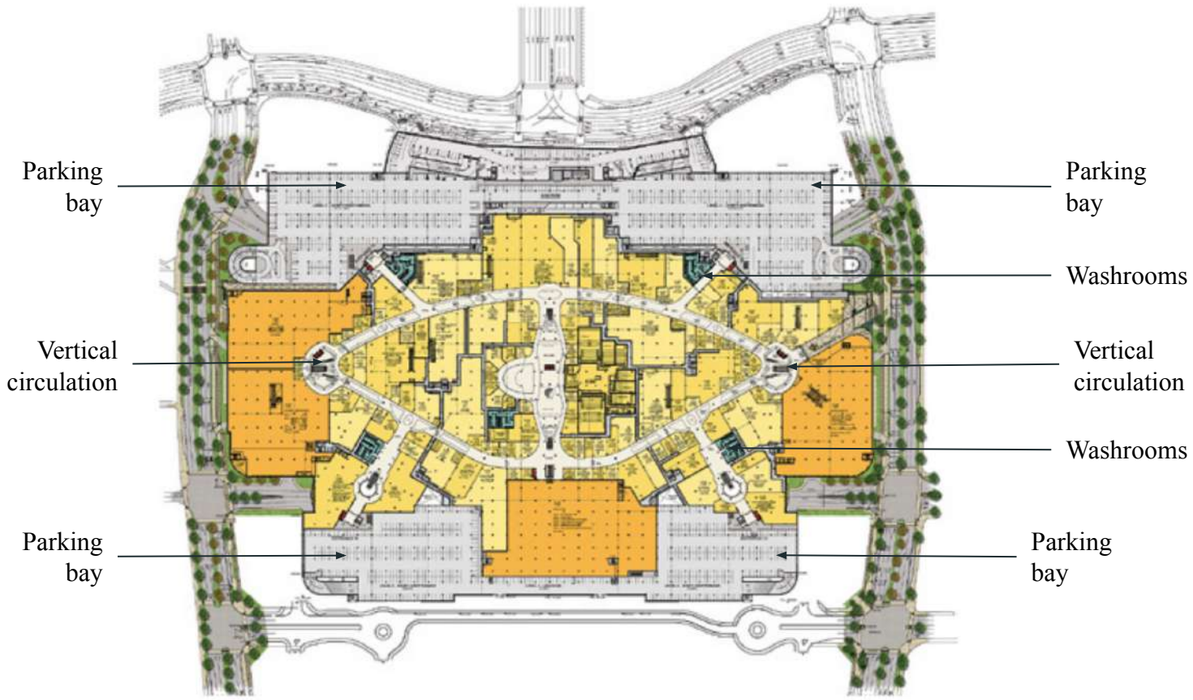
DRAWINGS ILLUSTRATING THE VARIOUS ACTIVITIES LOCATED ON LEVELS OF THE MALL OF AFRICA



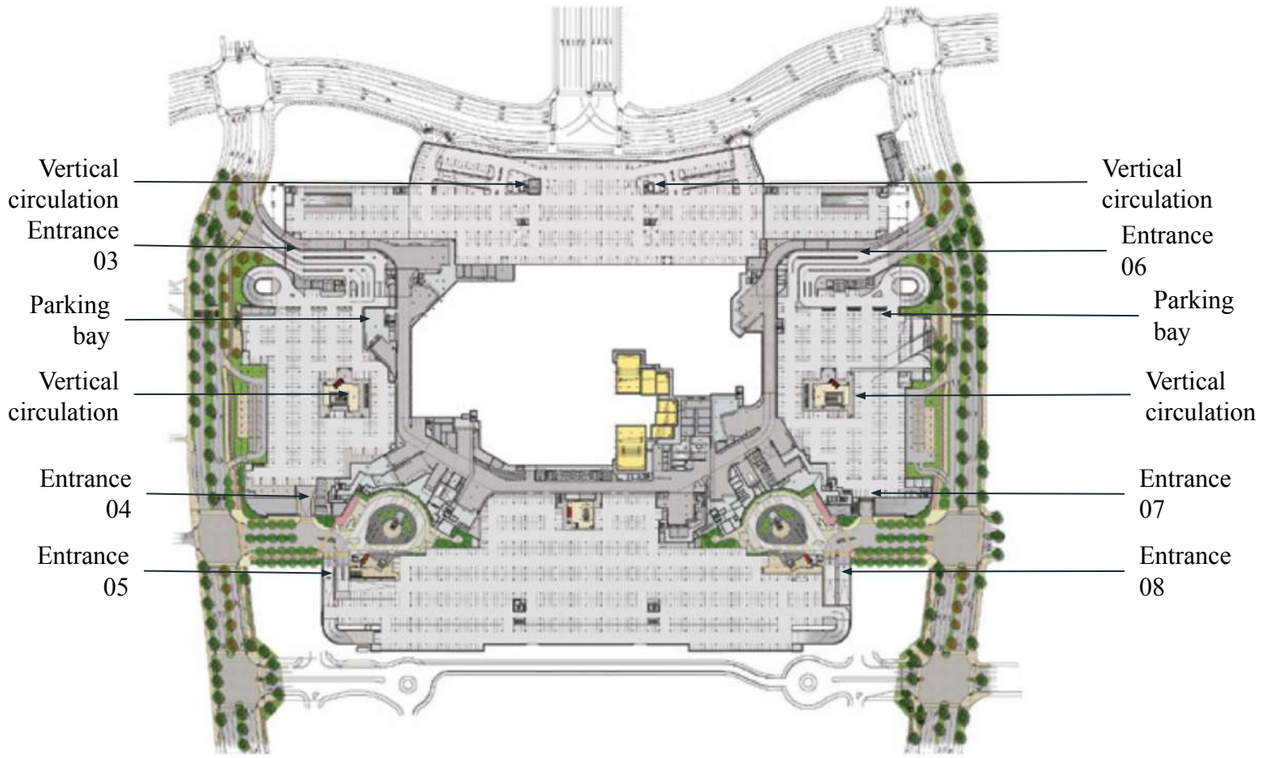
LEVEL 1 - PARKADES



LEVEL 3 - UPPER LEVEL SHOPPING & PARKADES

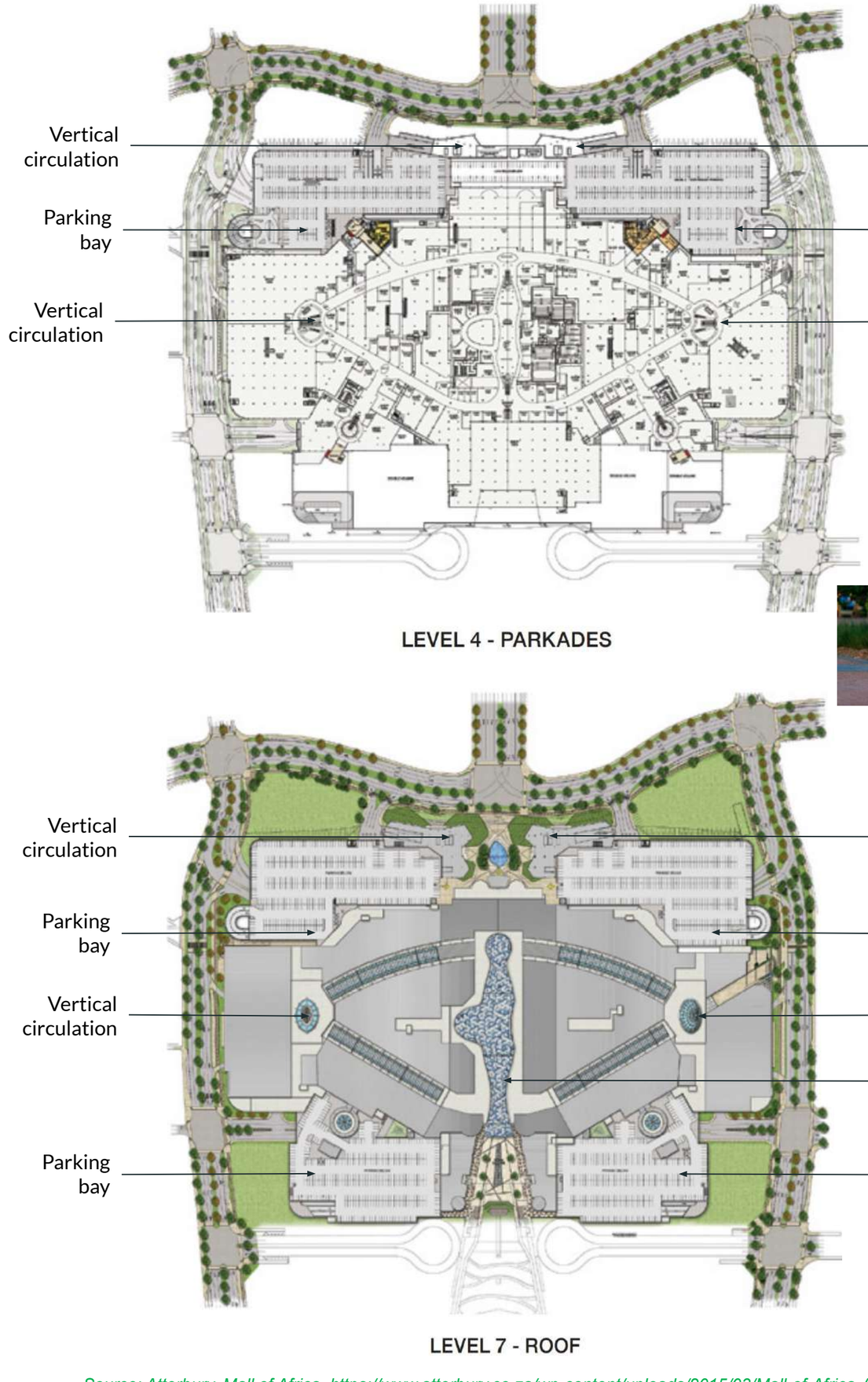


LEVEL 3 - LOWER LEVEL SHOPPING & PARKADES



LEVEL 2 - TRUCK TUNNEL DELIVERY & PARKADES

Images source; Atterbury, Mall of Africa, https://www.atterbury.co.za/wp-content/uploads/2015/03/Mall-of-Africa-August-2016.pdf



Source; Atterbury, Mall of Africa, https://www.atterbury.co.za/wp-content/uploads/2015/03/Mall-of-Africa-August-2016.pdf

SUSTAINABILITY

The massive photovoltaic roof provides 4.8MVA of sustainable power.

The roofing material was EFTE and it helps in thermoregulation during different seasons , provision of natural daylight

The Mall uses grey water harvesting in all public toilets and for the irrigation of the entire development. The grey water also provides irrigation for the public park alongside the building.

Image showing roofing, property24.com, May 3, 2019

The external facade also uses lightweight polystyrene wall system. This required less time for installation compared to common masonry construction.

Extensive led lighting design have been combined with the ETFE roof providing lighting and animation.

BUILDING SERVICES

The mall top is accentuated by double glazed roof lights.

Double glazed roof lighting, Atterbury, Mall of Africa, https://www.atterbury.co.za/wp-content/uploads/2015/03/Mall-of-Africa-August-2016.pdf

Vertical circulation is facilitated by escalators,elevators and stairs.

External facade is constructed with lightweight polystyrene wall called etics hence the need of mechanical environmental control.

SITE PLANNING

The design has incorporated various outstanding site planning features to maximise user comfort and functionality of the premises;

1) Parking Facilities

The facility has a total of 6 parking spaces each with a capacity of 500 cars to accommodate the massive number of users using the premises on a daily basis all of which are strategically placed close to the various entrances to the building.

The spaces are well organized and equipped with wayfinding systems to allow easy maneuver of

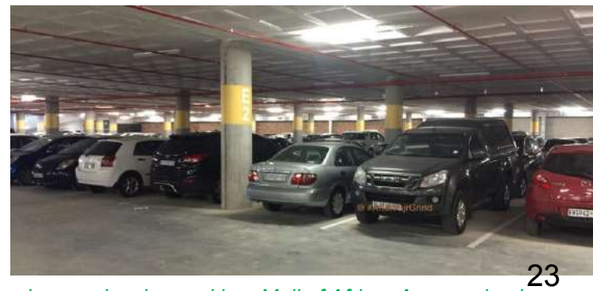
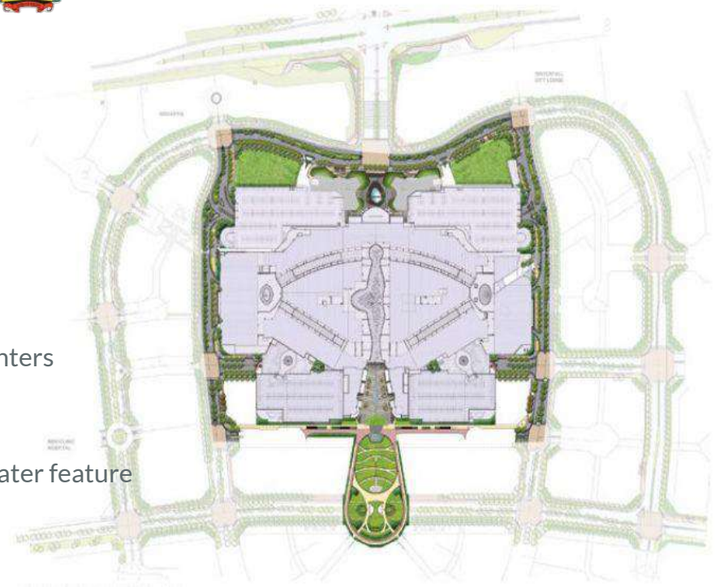


Image showing parking, Mall of Africa,-An oversized shopping complex, https://www.iloveza.com/

2)Pedestrian-friendly walkways

Wide sidewalks, well-defined pathways, and pedestrian zones are used within the premises to create a safe and enjoyable experience for shoppers.

There was also emphasis on the layout of the buildi on site to accommodate diverse number of activitie that are efficiently accessed by the users.



Plan showing landscaping, Atterbury, Mall of Africa

The landscape of the Mall of Africa consists of hard and soft landscaping in a variety of spaces including a water feature being the central focus, sculpted wooden benches with plane trees.

The landscaped areas are lit up using the Europa Post Top single and double and bespoke Linear lights were recessed into the concrete benches.

Source-https://www.regentlight.co.za/projects/shopping-centre-archive-page-1/mall-of-africa/

The Mall of Africa has achieved its impressive landscaping by seamlessly integrating natural and built elements. The design draws inspiration from the indigenous Highveld Ecosystem, creating inviting spaces for visitors. The mix of hard and soft features, including pathways, greenery, and water features, enhances the overall experience.

Outdoor spaces, Atterbury, /https://www.atterbury.co.za/

3)Green spaces

Gardens and water features are used around the site to add the aesthetics of the place and also offer resting zones within the premises.

4)Interactive spaces

Seating areas, shaded zones, and interactive installations are introduced along the walkways to encourage visitors to engage with the space beyond mere shopping.

LANDSCAPING

The landscape design for the Mall of Africa takes care of all external public spaces in and around the build structure within the site boundary – it connects and integrates with the surround public landscape environment, referring to the surrounding streetscape and park.

Landscaping in site planning, businesstech.co.za, Jun 3, 2016

The design aims to provide pleasant, inviting valuable and sustainable spaces for human use and enjoyment as an added experience in visiting the Mall of Africa. The design not only provides nature in an urban ecology, but it represents the indigenous Highveld Ecosystem.

Outdoor spaces, Atterbury, /https://www.atterbury.co.za/

The design of the park is based on the proven principle that responsive and meaningful open spaces do improve quality of life and add value to the adjoining property values.

Economic value:Picnicking, relaxation, jogging, cycling and dog walking in a safe and well secured environment are among the major attractions to the park.

CASE STUDY THREE: CENTRAL AMERICA REGION
CHICXULUB MARKET PLAZA

GENERAL INFORMATION

Architects: Estudio MMX

Area: 4404m^2

Year of completion: 2020

Location: Chicxulub Puerto, Mexico. (This is a village located on the Gulf of Mexico coast, near the city of Progreso)

Figures And Data References

1. Chicxulub Market Plaza / Estudio MMX | ArchDaily
2. Mall of Africa website, https://mallofafrica.co.za/blogs
3. Zutari Projects, https://www.zutari.com/project/mall-of-africa/
4. Project Feature by Atterbury: https://www.atterbury.co.za/wp-content/uploads/2015/03/Mall-of-Africa-August-2016.pdf
5. R1 Billion Deal Approval: https://dailyinvestor.com/property/54266/r1-billion-mall-of-africa-deal-approved/

PROJECT BACKGROUND AND PHILOSOPHY

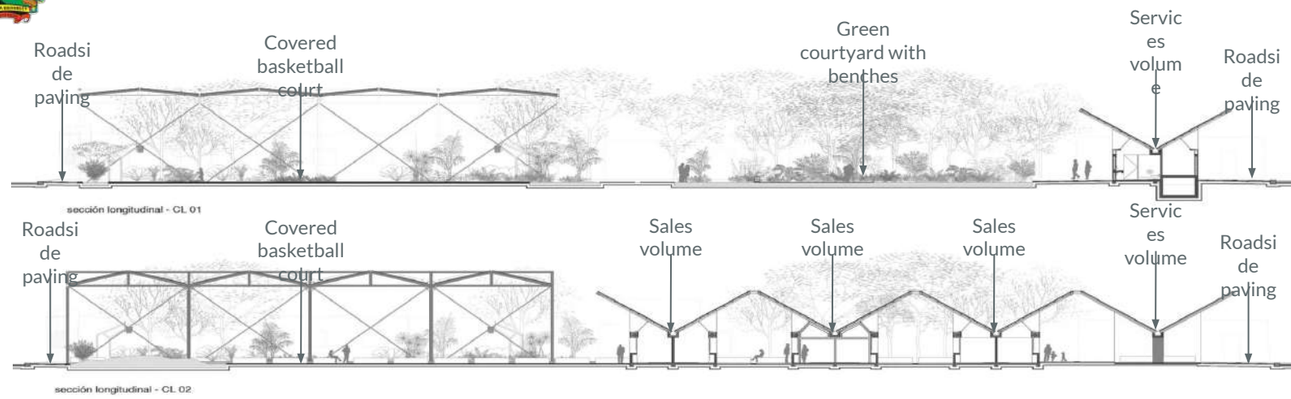
The Chicxulub market plaza is part of the Compranet community action plan with a budget of 500 million peso (4.6 billion Ksh) that also encompasses:

- Adjacent public plaza
- Sports field
- Library
- Waterside park

The project replaces an older facility deemed not well integrated with the street. Thus, project is centered on the communication of spaces.

CULTURAL AND SOCIAL SIGNIFICANCE

The Plaza to the North has a court, greenery and shaded area while the the market has five volumes that cast shadows allowing movement and pauses. Multiple sitting spaces are also provided.



The plaza provides suitable space for socio-cultural and civic congregations.

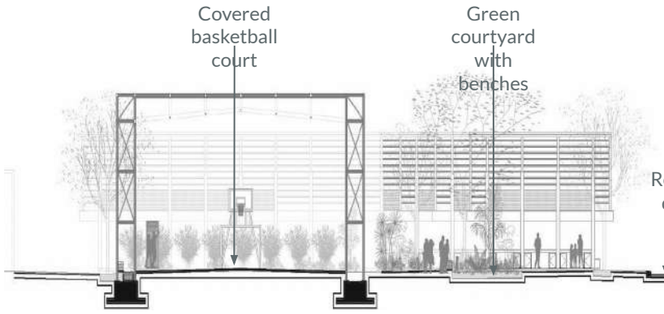
BUILDING SERVICES

The service volume contains administrative offices, warehouse, electrical room, laundry area, waste area and washrooms for the users of the market and plaza. One downside is that wheelchair-accessible washrooms are not provided on site.

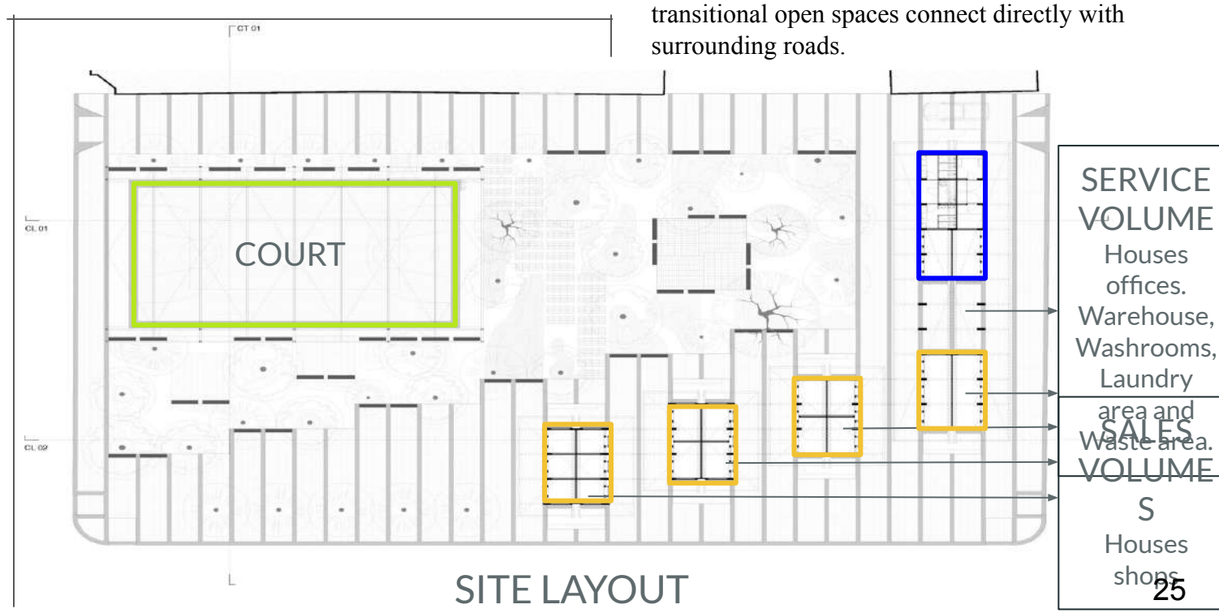
The stalls are naturally daylit and ventilated. The plaza has lighting fixtures to enable use at night and trees to provide shade during the day.

This ensures that the site is directly accessible from surrounding roads.
Access on site is limited to only pedestrians and vehicles have to be parked on adjacent streets.

The roof of the court is supported with steel members, with no opaque walls around it. This gives direct visual communication between the plaza and surrounding roads.
The large circulation spaces between shopfronts have been repurposed to provide ample sitting space for customers whale still leaving enough space for circulation.



Relationship to open spaces has been given great emphasis. A greater part of the site is open spaces with outdoor sitting provisions. The complimentary transitional open spaces connect directly with surrounding roads.



Lessons Learnt

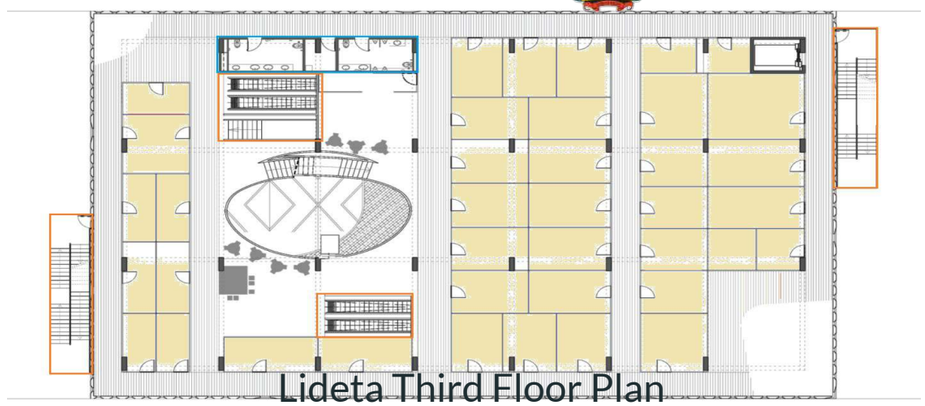
Unique architectural identity

The Mall of Africa has an outstanding architectural identity and is more memorable compared to Lideta market.

This is largely based on their external forms, interplay of materials and general aesthetics.

Urban Integration

The mall is part of Waterfall City, a new urban development that integrates living, shopping, offices, and leisure. It promotes an integrated live-work-play environment.



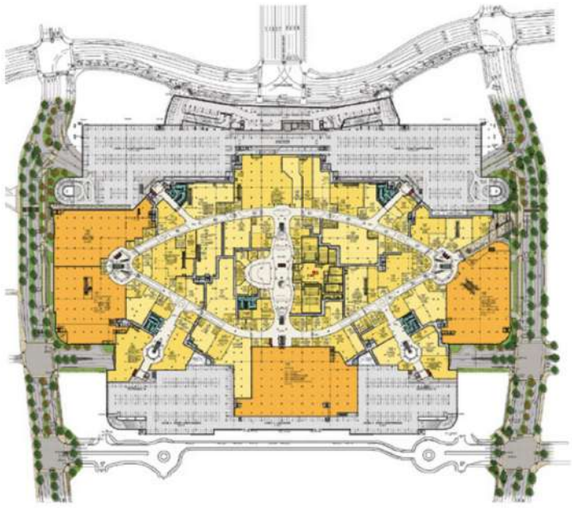
Wet Areas

Vertical Circulation

Vending Stalls

Circulation Zones

Mix of retail and amenities



LEVEL 3 - LOWER LEVEL SHOPPING & PARKADES

All precedents provide wet areas to ensure functionality. The Mall of Africa provides other support facilities such a baby changing room and breastfeeding station, a prayer room and reception/informations desk. It is also exceptional in its design of parking facilities.

Integration of technology

Both Lideta Market and Mall of Africa utilize technology in construction. Lideta Market makes use of prefabricated concrete walls to control ventilation and illumination of interior spaces while Mall of Africa makes use of ETFE panels in a designed pattern for shading.

Ample Parking and Accessibility

The Mall of Africa provides 6500 parking bays, 2 taxi layby areas, valet parking, bus drop-off as well as Uber pick-up and drop-off zones. Within the parking, adequate space has been reserved for servicing bays and routes.

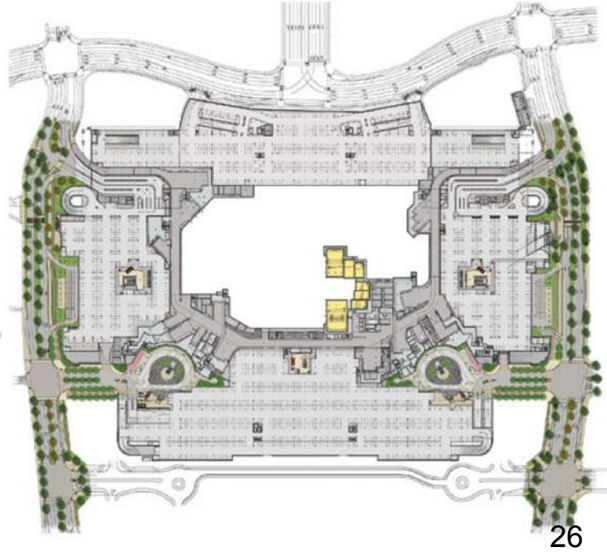
Lideta Market has a single provision for service bay and delivery and three levels of underground parking.

Efficient space planning

Lideta Market and Chicxulub Market Plaza have simple layouts that are easy to follow while Mall of Africa has a more complex layout. In all three, shop outlets are easily accessible. Of the three, Lideta excels in providing clear circulation routes.

Provision of engaging public spaces

All three precedents make provision for shared public spaces for social interaction and leisure.



LEVEL 2 - TRUCK TUNNEL DELIVERY & PARKADES

C. HIGH RISE OFFICE BUILDINGS

Presented here are reflections on well analysed international, award winning precedents of architectural design projects on Office Buildings and in their analysis that emphasises concepts and technical considerations

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

Angela Koki
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Benson Gitiye
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Gloria Chepkorir
Hagee Chira
John Mwambamba
Maina Wairimu
Mary Koinange
Mwendwa Mutunga
Nick Marete
Omondi Charles
Patrick Njuguna
Wanjeri Njau
Yegon Chebet

CASE STUDIES

A. South African Region Case study: I - CAT Building, Pretoria, South Africa
B. Israel region Case Study: Telaviv, Israel

SOUTH AFRICAN REGION CASE STUDY: I - CAT BUILDING, PRETORIA, SOUTH AFRICA

Project Overview

1. **Project Description**
2. **Location**
3. **Climate**
4. **Project Brief and Concept**
5. **Site Access & Area Analysis**
   - ★ **Site Access**
   - ★ **Circulation**
   - ★ **Space Relation**
   - ★ **Hierarchy of Spaces**

1. Project Description

Exterior image of I-Cat (Icat-eco-factory05_Commended-project | Visi, n.d.)

Architect - Earthworld Architects & Interiors
Location - N4 Gateway Park in Pretoria, South Africa
Year of completion - 2015
Manufacturers: Corobrik, RAW Studios, Safintra
Collaborators: DFL Engineering /JC van der Linde & Venter
Area - 1949 m² (0.48 acres), Office Building (914m²)
Category : Offices

Recognition:

- 5 Star LEED Certified Building
- Afrisam-Saia Sustainable Architecture Award
- WELL Core Silver Energy Certified Building

2. Location

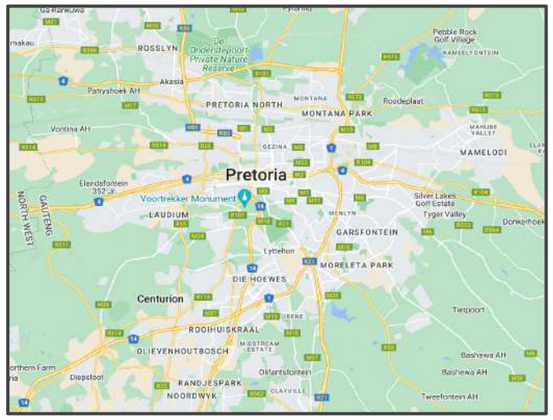
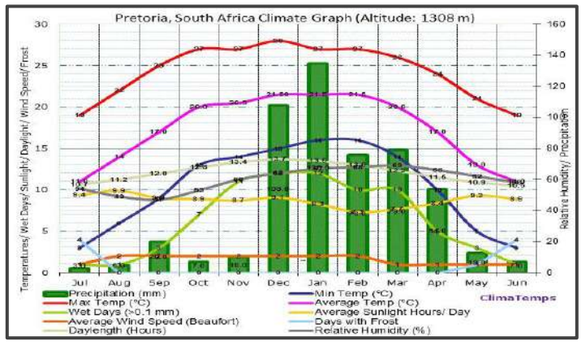


Image showing location of Icat (Airbtics, n.d.)

ICAT INTERNATIONAL CONSULTING AND TRADING (PTY) LTD is located at N4 GATEWAY OFFICE PARK,PRETORIA, Gauteng, South Africa. Located in the outskirts of Pretoria town. A 26 minute drive from the Central Business District
It is located between two main highways in an area zoned for Industrial and Commercial use
A residential zone borders the Industrial zone
Making the location a suitable area for the I-CAT offices based on need, demand and in a mixed use development area
Office Address : N4 GATEWAY OFFICE PARK, ERF 516 38 AMATOLE ST WILLOW PARK MANOR PRETORIA, Gauteng, 0181 South Africa

3. Climate



Temperature chart for Pretoria. Campbell, J. A. (2020, February 26).

Pretoria has a subtropical monsoon climate (Köppen: Cwa) with:

- long hot rainy summers,
- short, dry and mild winters.

The city experiences the typical winters of South Africa with cold, clear nights and mild to moderately warm days.

Response to Climate.

- The orientation of the building places the offices closer to the northern side of the building. This ensures greater solar access during winter
- The specially designed roof and overhang reduces solar gain during the summer months.
- Shading devices are utilised on the northern, eastern and western sides of the building, to limit direct sunlight. However, natural light will be used during the day, in addition to solar power.

Gallery of I-CAT Offices and Warehouse . Earthworld Architects & Interiors - 13. (n.d.). ArchDaily.

4. Project Brief and Concept

Brief

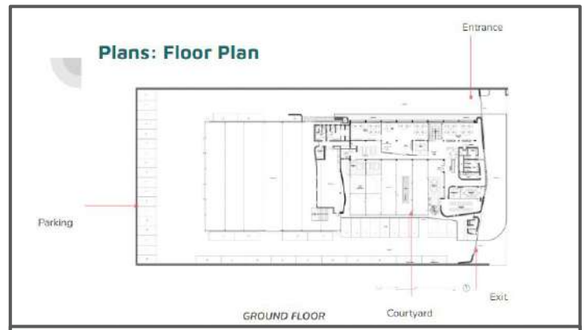
The Client's brief was to create a flagship building based on ecological sustainable principles which would showcase their philosophy toward the natural environment.

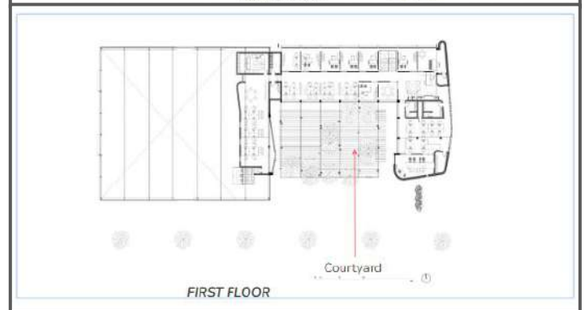
I-CAT Offices and Warehouse. Earthworld Architects |. (n.d.).

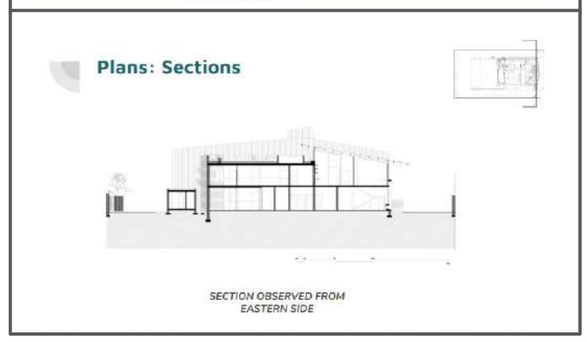
Concept

The design philosophy was sustainability.
The design response was a building that would be sustainable on all three levels:
Ecological: water management(rainwater harvesting) and natural materials (brick)
Social: open, multi use and dynamic spaces
Economical: use of local and natural materials and open spaces
Understanding that these three pillars of sustainability influences one another, the objective was to find a balance.
The building being within an industrial zone it also employs an industrial design theme through exposed dynamic systems around the passive systems which further improve the comfort of its users and create a conducive working environment.
The color brown for the facade and in the choice of materials is informed by the dry climate in the area and to allow the building to blend into its surroundings

Plans and Sections







5 Site Access & Area Analysis

Site Analysis

Ground Floor

- Total number of users the building can accommodate: 130
- 35 strip parking spots.
- 20 parallel parking spots
- The site being small (0.4 acres) the amount of parking is limited for all it's users
- For efficient and functional use of space, parallel parking was employed at the edge of the site and at the south facade of the building

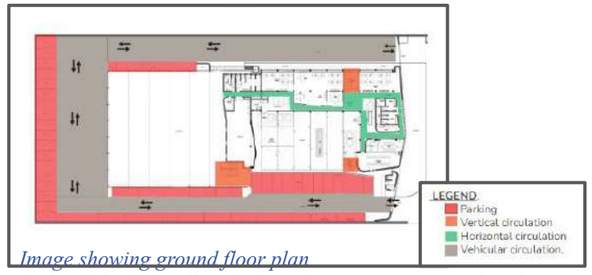


Image showing ground floor plan
Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 28, n.d.

First Floor

- The building is accessed using a double loaded corridor.
- This allows for a myriad of uses for the buildings interior.
- The primary staircase is adjacent to the entrance, at the end of the corridor making it easy to spot

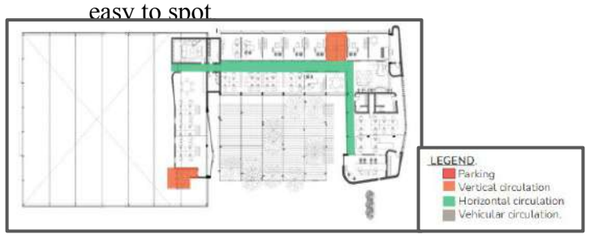
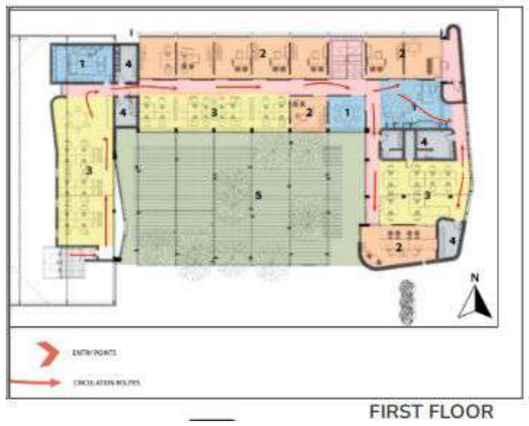
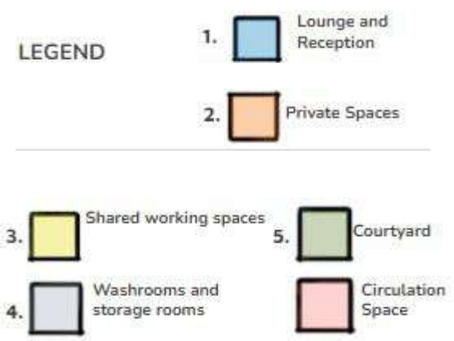


Image showing ground floor plan
Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 28, n.d.

1.Primary staircase | 2. Emergency staircase | 3.Secondary/private entrance.





Images showing I-Cat floor plans
Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 28, n.d.

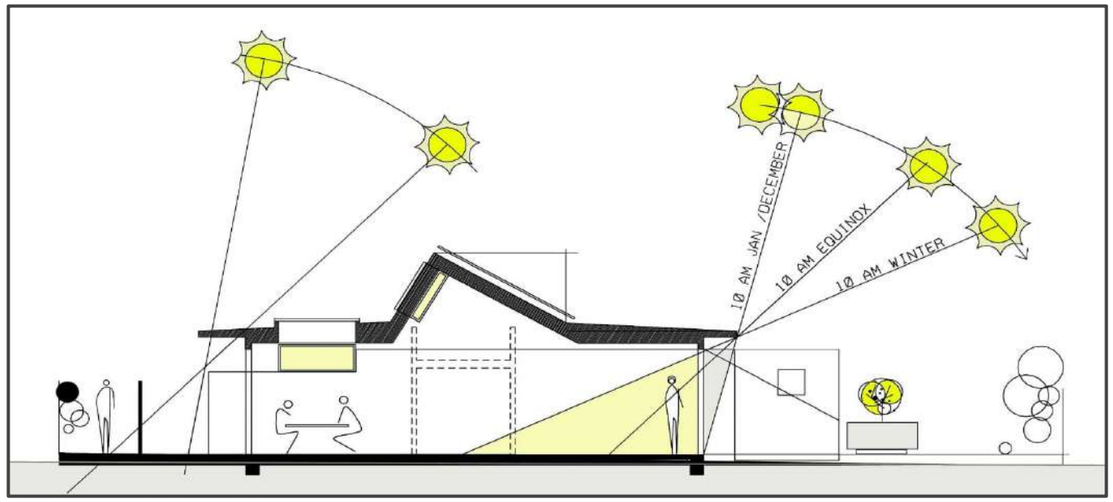
Climate Response Through Layout

In South Africa, orienting a building to face north is primarily aimed at optimizing solar exposure on the northern side. By doing so, the building can receive more direct sunlight, especially during the winter months when the sun is lower in the northern sky. This helps in natural heating and lighting, reducing the need for artificial lighting and heating systems.

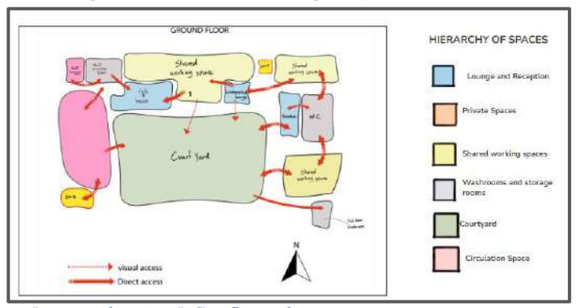
On the southern side, where the sun is less prominent, designers may minimize openings or use shading strategies to control solar exposure and prevent overheating during the warmer months. So, while the focus is on harnessing sunlight from the north, balanced design considers ways to manage exposure on the south to achieve overall energy efficiency and comfort.

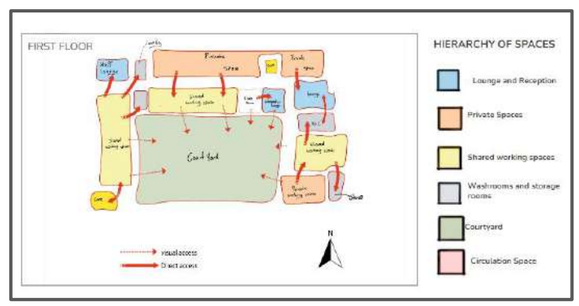
Area Analysis : Space Relation

1. Offices are located on the Northern side to receive sunlight during winter and reduce heat gain during summer.
2. 2. Offices on the northern side are shaded by an overhang roof from the sun during summer to prevent overheating



(Our Design — Stellulata Cohousing, n.d.)





Images showing I-Cat floor plans
Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 28, n.d.

SPACES	NO. OF SPACES	AREA (m²)	NO. OF USERS	FUNCTIONAL REQUIREMENTS	FURNITURE LAYOUT
Reception	1	18	1	Sufficient lighting, proximity to entrance.	Open layout
Private spaces	9	185	12	Sufficient lighting, ventilation and privacy.	Private office layout
Shared working spaces	6	366.1	62	Sufficient lighting, ventilation and circulation.	Team-cluster, Open & Banquet layouts
Meeting rooms	2	58.4	24	Adequate privacy, lighting and ventilation.	Boardroom layout
Lounging Area	5	125.5	30 estimate	Sound and visual separation from working spaces.	Open & Banquet layouts
Washrooms	2 (6 toilets & 4 urinals)	63	10	Privacy, ventilation	Cubicles
Courtyard	1	388.5	500 approx	Aesthetics.	Open layouts

Technical Considerations

- Site
  Water and Drainage
  Landscape
- Building
  Power Source and Lighting
  Materials
  - ★ Thermal comfort
  - ★ Acoustics

  Safety
  - ★ Fire
  - ★ Earthquakes
  - ★ Floods

SITE:Water and Drainage

Sources: Municipal water and rainwater

Drainage: Finish grades sloped to drain surface water away from building to courtyard gully, flat and pitched roof drainage system are employed.

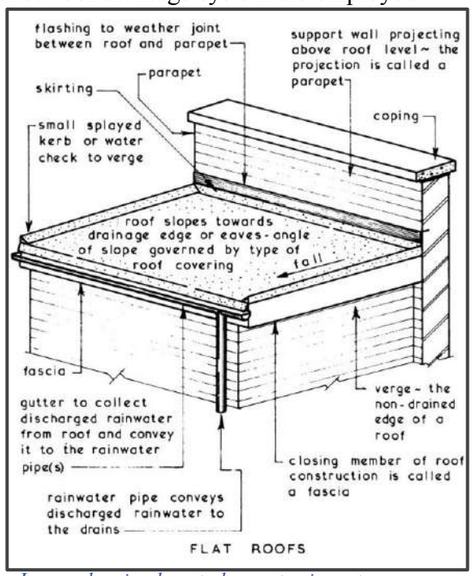


Image showing how to harvest rain waters (Aghghaleh, 2015)

- The calculated median water consumption intensity across the entire data set of office buildings is 1.17 m^3/ m^2/year. Thus the I CAT Office buildings averages around 2,280 m^3/m^2/year. Water efficiency strategies like rain water harvesting reduce reliability on municipal water.
- Rainwater is harvested from the roof and stored in underground water tanks where municipal water is also stored. The water is then pumped to a water filtration system located underneath the warehouse that assists in purification. Harvested rain water is used for non potable cases, such as irrigation, custodial uses, flushing toilets and urinals.
- Water stored is also used as process water.

CRITIC: It is not necessary to treat the water because the water is not for potable use instead the the dedicated use for irrigation, cleaning, flushing urinals and water closets.

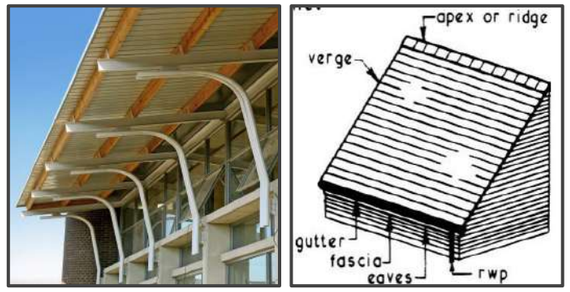


Image showing roof overhang
I-CAT Offices and Warehouse / Earthworld Architects |. (n.d.).

SITE:Landscape

The southern courtyard of the building has:

- Grass block pavers
- Planted Areas:
  - Fever Trees Planted in the courtyard grow through the pergola structure.
  - Roof Garden on the Eastern part of the structure.
- Timber Decking
- Linear Koi Pond

Image showing the Courtyard
I-Cat Eco-Factory - 2015 - Earthworld Architects & Interiors. (n.d.).

Grass block Pavers

WHY WAS IT USED?

- Reduce Stormwater runoff: recharging the groundwater, to aid growth of trees in the courtyard.
- Keeps the courtyard cool as compared to a an asphalt drive.
- Aesthetics

Image showing concrete pave blockers
Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 13. (n.d.). ArchDaily.

Outdoor Relaxation Features

Courtyard

- Timber decking was adopted as it offered a more natural aesthetic look.
- The types of timber used were Spotted Gum and Treated Pine.

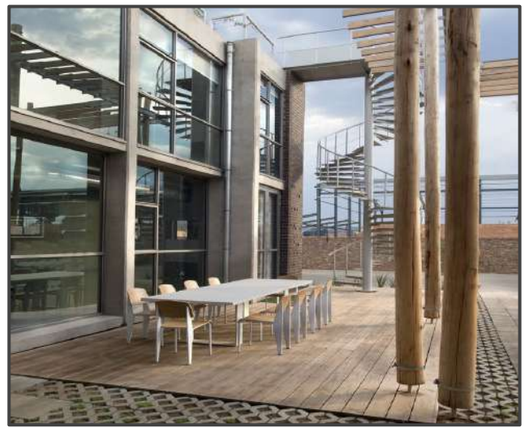


Image showing outdoor courtyard
(Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 12, n.d.)

Koi Pond

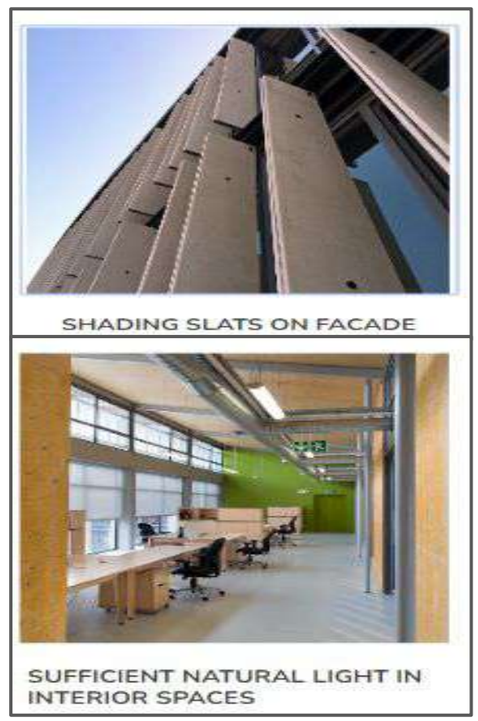
- The water feature keeps the courtyard cool during hot days.
- Acts as a scenic view for outside gatherings and for guests coming to the building

Image showing the Koi Pond
I-Cat Eco-Factory - 2015

BUILDING: Power Source and Lighting

The main source of power for the building is from the grid, supplemented by solar energy.

- Solar energy is primarily used for water heating needs while power from the grid supplements lighting
- The building's orientation prioritizes offices on the northern side, maximizing solar access in winter for enhanced energy efficiency.
- According to the OHSA (The Occupational Safety and Health Administration), office spaces require a minimum illumination of 500 lm/m^2. With windows covering majority of the northern and southern facades the interiors of the building are sufficiently light with upto 10,000 lm/m^2 of light on a sunny day and 1000 lm/m^2 on an overcast day
- The building **primarily utilises (80%) natural lighting to light the office spaces**
- **Downlighting LED light fixtures supplement lighting within the main office spaces especially during winter -** conserving energy and reducing energy costs
- **Shading devices utilised on the northern, eastern and western sides of the building** limit direct sunlight that may cause glare in the office space



BUILDING: Materials: Thermal Comfort
Thermal requirements of an office space

- The optimum comfort in an office space is generally between **20-26 degrees celsius**.

How has thermal comfort has been achieved?

- **Orientation:** The offices have been designed to be on the northern side to maximize solar access during the winter season
- In the summer months the building is **nocturnally ventilated**.
  - This happens in the early hours of the morning allowing the internal temperatures to drop, fresh air will be contained for as long as possible.
  - When temperatures get high,windows at the top automatically open allowing hot built up air to escape.

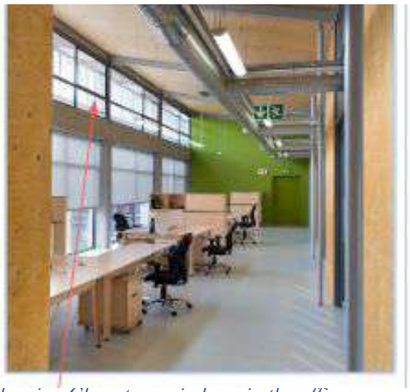


Image showing Clerestory windows in the offices
(Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 7, n.d.)

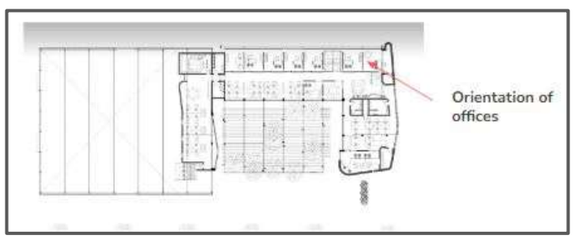


Image showing floor plan
Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 28, n.d.

- The **courtyard** in the southern end creates a light environment which draws cool air into the building maintaining the thermal comfort of the building for its users.

Image showing Courtyard space in I-Cat
I-Cat Eco-Factory - 2015

- Naturally, the **building walls are exposed concrete which keeps the interior of the building cool**
- The building also uses a **small inverter air conditioning system** which runs from solar power.
- When temperature falls below or above comfort level,the air conditioning system automatically activated to set the temperature back to optimum thermal comfort.

Image showing Clerestory windows in the offices
(Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 7, n.d.)

- **Shading devices.**
  On the north facing windows ,a roof overhang completely shades the building during summer and partially during winter.
  Vertical fins on the east facing windows deflect the early morning radiation during summer and the afternoon sun on south facing windows.
- Windows on the face brick facade ,which is east and west was restricted for thermal reasons.

BUILDING: Materials: Acoustics

Things to consider when designing for acoustics for an Office space:

- **Permissible Background Noise Levels**: to ensure a quiet and focused work environment (dB).
- **Acceptable Reverberation Time** for different spaces within the office.
- **Room-to-Room Sound Isolation** to prevent the transmission of noise from one area to another.
- **Emergency Communication**: systems, such as alarms and announcements, are audible and intelligible throughout the office building
- **Set standards for HVAC System Noise Control**: generated by the heating, ventilation, and air conditioning (HVAC) systems.
- **Acoustic Treatments**: such as wall panels, ceiling baffles, or acoustic clouds to control noise levels and enhance the overall acoustical environment.
- **Set standards for Noise from Building Services**:such as elevators, escalators, and other mechanical systems to avoid disturbances to occupants.
- **Determine the amount of Sound Absorption**: required in different areas of the office to minimize reverberation and enhance speech intelligibility.

Images showing interior and exterior of I-cat
(Barnes, 2015)

Techniques used to acquire the required acoustics for the building:

- Acoustic partitions: made of plywood, were designed to absorb sound and reduce echoes within the spaces.
- Soft Flooring: The use of rubber flooring to absorb impact noise, reduce footsteps, and improve overall acoustics.
- Building envelope: The building envelope is constructed using brick which absorbs noise from the outside environment.
- Buffer zone: Trees were planted between the parking area and the building to reduce the impact of noise from moving vehicles.
- Separation of working spaces: Private spaces are mainly located on the first floor and co-working spaces in the ground floor

BUILDING: Safety: Fire

Image showing fire escape in I-Cat
(Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 7, n.d.)

- Fire detection and alarm systems

An advanced fire detection and alarm system covers all areas of the office space. The system is equipped with smoke detectors, heat detectors, and manual pull stations to detect fires at an early stage. The alarm system with a central monitoring station for rapid response.

- Fire resistant construction materials

Concrete is the main building material for the wall construction, which is fire resistant

- Emergency exits and evacuation routes

Emergency exits, stairwells, and evacuation routes are clearly marked with exit signs. Exits are easily accessible, and in visible locations, providing guidance on evacuation routes and assembly points. Push doors to facilitate is exit and evacuation

- Fire suppression systems

Gas Fire extinguishers are employed within the office spaces

- Emergency Lighting

Emergency lighting in corridors, stairwells to provide illumination during power outages.

CONCLUSION

Conclusion : Environmental resilience

Earthworld Architects designed the building by incorporating three pillars of **sustainability**. **Environmental resilience, economic demands, and social sustainabilit**y were key focuses of the building's design.

- **Environmental resilience:**
  - **Water Conservation:**
    - Harvest rainwater from the roof. Store it underground in water tanks for landscaping around the building.
    - Combine with municipal water for non-potable uses.
    - Contribute to reducing overall water consumption.
  - **Stormwater Runoff Reduction:**
    - Use concrete block pavers,

Image showing roof overhang
I-CAT Offices and Warehouse / Earthworld Architects |. (n.d.).

  - **Solar Access and Heat Management:**
    - Position offices on the northern side for more winter sunlight.
    - Design roof and overhang to limit summer solar gain.
    - Install shading devices on the northern, eastern, and western sides**.**
  - **Lighting Optimization:**
    - Use natural light during the day.
    - Artificial lighting is activated automatically if natural light is insufficient.
  - **Energy-Efficient Water Heating:**
    - Solar heating for water in offices and warehouse to reduce energy consumption.
  - **Buffer zone:**
    Trees planted between the parking area and the building to reduce the impact of noise from moving vehicles.

Conclusion:Economic Sustainability

- **Economic sustainability:**
  - **Natural and locally sourced materials** used in the building's construction reducing the energy and cost required to transport them to site.
  - **Open plan design** allows the warehouse's interior to be adjusted and changed to accommodate future needs.

Image showing layout in the offices
(Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 7, n.d.)

Conclusion: Social Sustainability and Functional Design

- **Social sustainability:**
  - The courtyard brings in natural light, allowing cool air to flow into the building. This creates a pleasant outdoor space, enhancing the well-being of users through outdoor interactions.
- **Functional Design:**
  - **Cooling System:**
    - A small solar-powered inverter AC system maintains occupants' comfort.
    - Automatically activates when office temperature is below or above the comfort range.
- **Acoustic Features:**
  - Acoustic partitions made of fiberglass and fibreboards absorb sound and reduce echoes.
  - Soft rubber flooring minimizes impact noise, footsteps, and enhances overall acoustics.
  - Building envelope constructed with noise-absorbing brick reduces outside noise.
- **Workspace Arrangement:**
  - Private workspaces are on the first floor.
  - Co-working spaces are on the ground floor.
- **Sunlight Control:**
  - Shading devices on northern, eastern, and western sides prevent direct sunlight and office glare.

Conclusion: Critics and Recommendations

1. **Water and Drainage**:
   It is not necessary to treat the water because the water is not for potable use instead the the dedicated use for irrigation, cleaning, flushing urinals and water closets.

2. **Landscaping**:
   Effectiveness of the Koi water pool for cooling is not efficient instead it was placed for aesthetic purposes. The pool is small and would need to be enlarged to provide a sufficient cooling effect during the summer.

3. **Thermal comfort**:
   Temperature control in summer is notably innovative however during winter there is a total reliance on air conditioning.
   Recommendation: Since the building has over 100 users they can employ sustainable strategies such as the use of biogas as an alternative to supplementing heat for the building and it's users

Image showing courtyard and layout in the offices
(Gallery of I-CAT Offices and Warehouse / Earthworld Architects & Interiors - 7, n.d.)

B. Israel Region Case Study: Tel Aviv Israel

Project Overview

1. **Project Description**
2. **Location**
3. **Climate**
4. **Project Brief and Concept**
5. **Key Design Features**
6. **Site Access & Area Analysis**
   - Site Access
   - Space Relation
   - Circulation
   - Hierarchy of Spaces
   -

1 Project Description

Architects: Ron Arad Architects

Executive Architect: Avner Yashar, Yashar Architects

Client: Amot And Gav-Yam

City: Tel Aviv-Yafo,Israel

Area: 53000 M²

Year Of Completion: 2019

Manufacturers: Cosentino, Digom, Guardian Glass, Pellini Industries

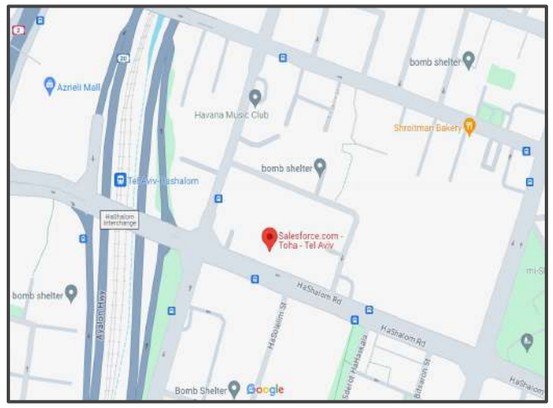
Engineering: Buro Happold, David Engineers

Category:Offices

TOHA | Ron Arad Architects - Arch2O.com. (2021, May 17).

AWARDS: LEED PLATINUM CERTIFICATION.

2. Project Overview: Location

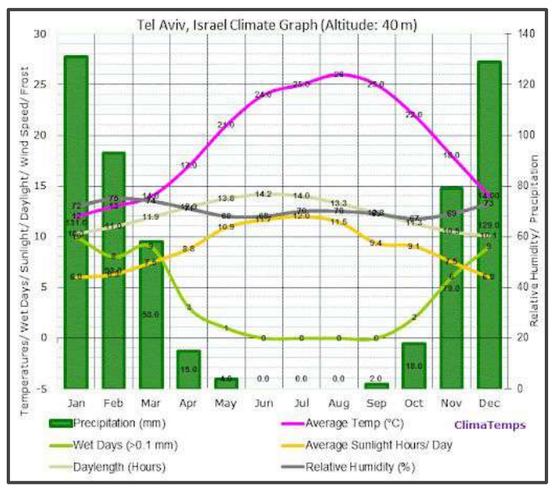


- The two office towers is in the Israeli cities Nahalat Yitsak neighbourhood.
- The complex is located on and named after Totzeret Haaretz Street in Nahalat Yitzhak, in eastern Tel Aviv. It faces HaShalom Street in the south and Yigal Allon Street in the west.
- The building is close to the city's largest train station and is situated within a generous public landscape.

3. Project Overview : Climate

CLIMATE

Tel Aviv has a hot mediterranean/ dry-summer subtropical climate (Köppen-Geiger classification).Summers are dry and hot due to the domination of subtropical high pressure systems while winters experience moderate temperatures and changeable, rainy weather due to the polar front.



(Climate Graph for Tel Aviv, Israel, n.d.)

RESPONSE TO CLIMATE.

The building's environmental approach fuses traditional regional passive solutions, with state-of-the-art energy saving and intelligent facade system.

Incorporation of an atrium in the design.The atrium helps cool down the buildings thermal mass through natural flow night flushing.

Use of shading devices.The building is shaded using shlab extensions/shelves.They protrude beyond the glazed facade.They are designed on the basis of solar incidence ,glare and daylight factor simulations .

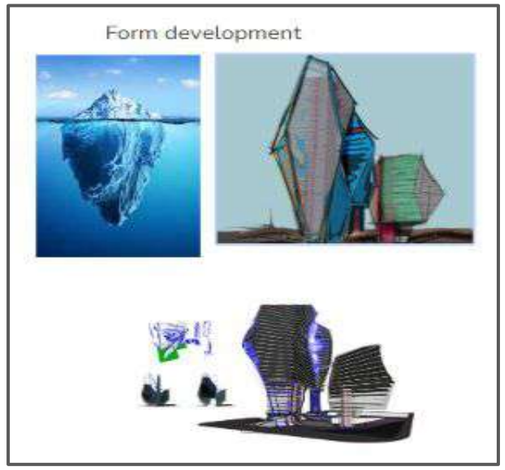
4. Project Brief and Concept

The building's unique geometry was inspired by the concept of an iceberg that assumes irregular forms in all directions, resulting in unique layouts at every level.

This was achieved by incorporating a distinctive stepped form that resembles the gradual tapering of an iceberg beneath the water's surface.

The building's exterior features a series of terraces and setbacks, creating a visually striking profile that emulates the dynamic and asymmetrical nature of an iceberg.

Additionally, the use of reflective glass and angular facades further enhances the impression of a crystalline structure, reinforcing the visual metaphor of an iceberg emerging from the ground.



Conceptual Images
(Gallery of TOHA Office Development / Ron Arad Architects - 61, n.d.)

TOHA | Ron Arad Architects - Arch2O.com. (2021, May 17). Arch2O.com.

Collage of images showing concept development for TOHA
James, L. (2020, February 3).

5. Project Overview: Key Features

Public garden / Toha gardens

Based on the design concept to use the ground as little as possible.The idea was to have minimal contact at the floor to create the smallest footprint ever.

Ron Arad Architects. (n.d.). ArchDaily.

Roof terrace

The project reverses the organization of a conventional office building, placing all infrastructure and machinery on the first floors. This turns the roof into a public space and houses an exclusive restaurant with views of Tel Aviv and the Mediterranean Sea, an observation deck and a public garden.

Ron Arad Architects. (n.d.). ArchDaily.

Facade

The technical levels are covered with a unique permeable facade of transverse panels, forming an "X" pattern. This woven basket-like arrangement allows for ventilation to the, and provides a coherent aesthetic to the first seven floors of the building.

Ron Arad Architects. (n.d.). ArchDaily.

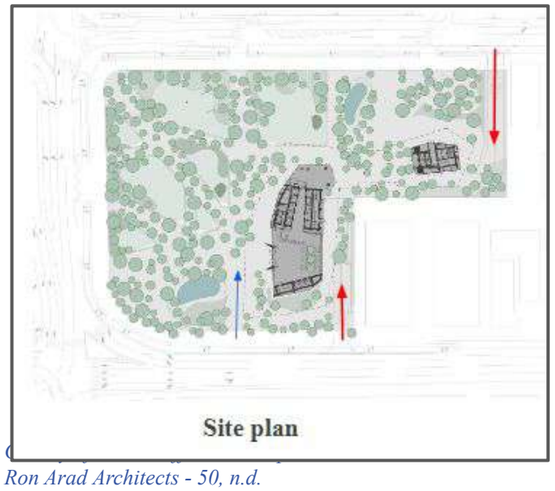
Entrance lobby

An entrance with a 30-metre-high atrium, planted trees and a skylight enabling daylight provision to the deeper areas of each floor.

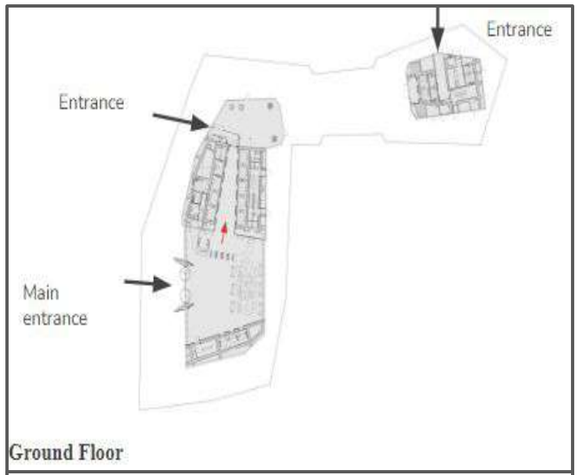
Floor plans:

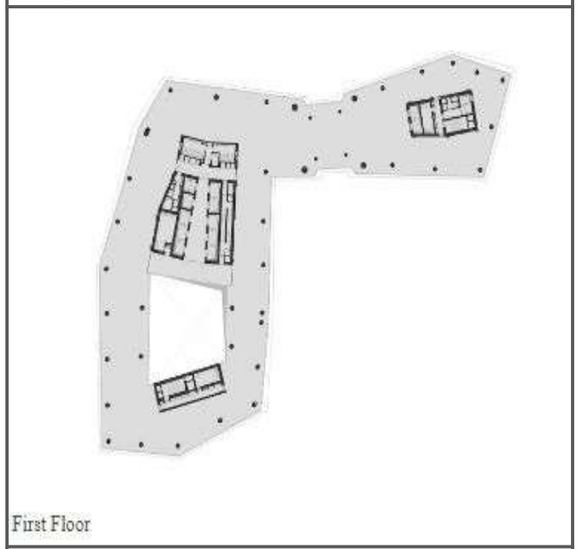
As the needs of contemporary tenants vary and change over time, the building's interior spaces needed to be adaptable.

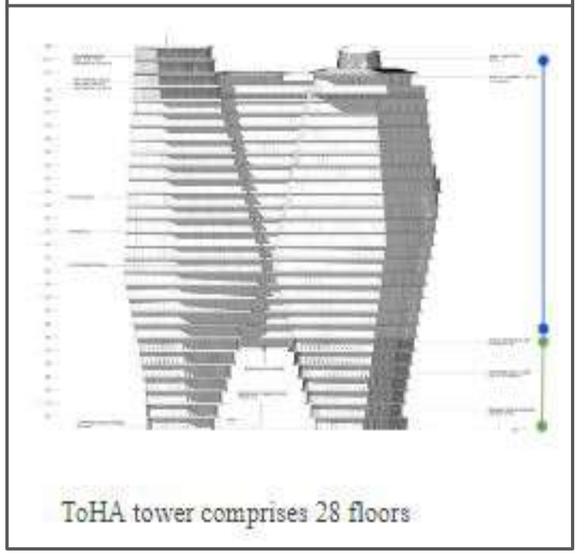
The flexible floorplans are designed to be customisable depending on office tenants, and can contain either one company or be divided for up for seven tenants to share a floor.



Ron Arad Architects - 50, n.d.



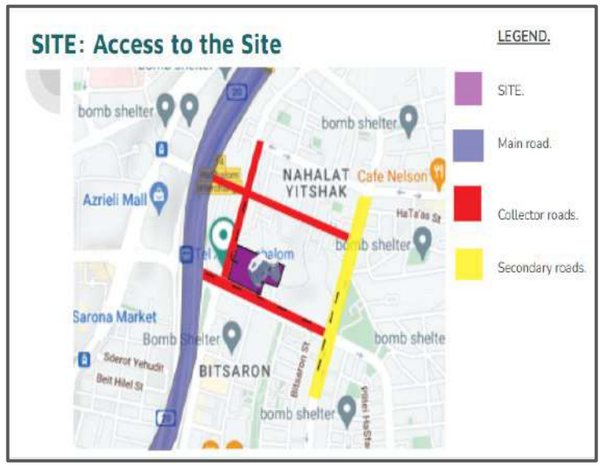




Gallery of TOHA Office Development
Ron Arad Architects - 50, n.d.

6. Site Access & Area Analysis

Site Access



The complex is located on Yigal Alon Street, in the heart of Tel Aviv and close to all transportation routes.

Bus

Dozens of bus lines pass through the area of the compound. The nearest station is outside the building, where lines 7, 46, 54, 59 pass.

Train

The Tel Aviv-Hashalom train station is across the road, a minute's walk away.

Private car

The complex is located at a junction of main arteries - it can be reached from Derech Hashalom, Derech Namir, or Ayalon lanes when exiting at the Hashalom interchange.

Parking

Paid parking in the building's underground car park at a cost of NIS 1,200 + VAT per month. Daily NIS 60 Parking in additional paid parking lots in the area of the complex, such as the "California House" parking lot located on Tozeret Ha'aretz Street near the complex at a cost of NIS 500 + VAT per month.

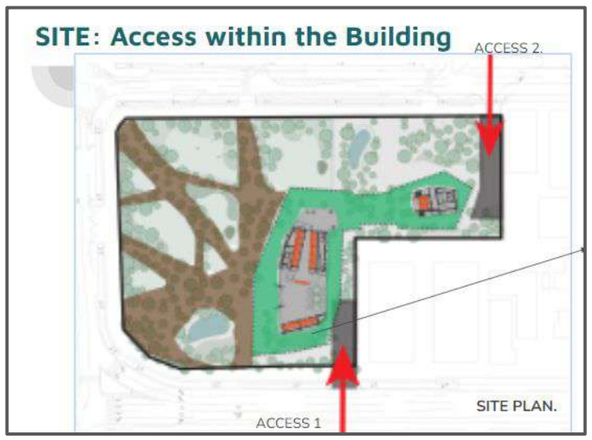
Bicycles

There is a Tel Offen station at the corner of Yigal Alon and Derech Hashalom streets, a minute's walk from the complex. In addition, it is possible to store bicycles inside Wi-Fi.

The new building increased flow of traffic into the building

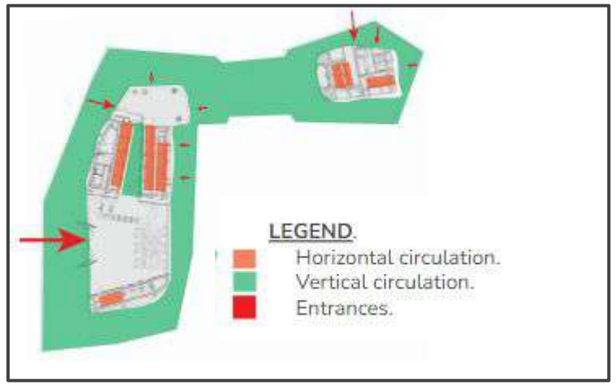
Light Rail System bus stops and wider pedestrian walkways have increased as a direct result of the buildings construction.

Access within the Building



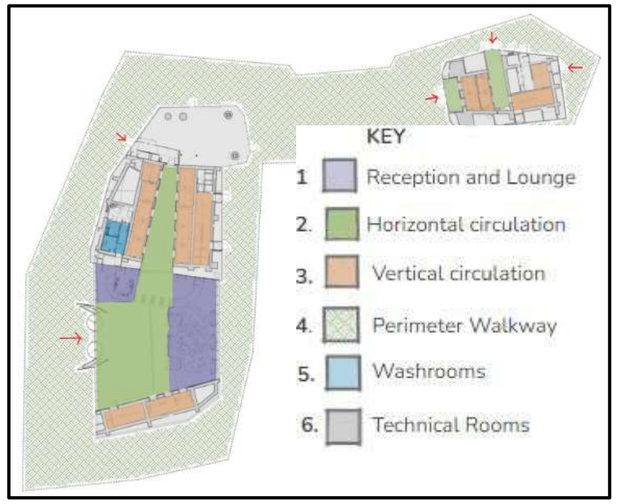
The building is supported by two “legs” that join to form on “body”. Giving the illusion of two buildings held together.
In order to encourage workers in the building to use green transportation, the structure offers hundreds of secured parking spaces for bicycles. The underground parking lot, in contrast, has only 950 spaces – less than the 1,300 that were approved by the planning commissions.

Access within the Building: Accessibility



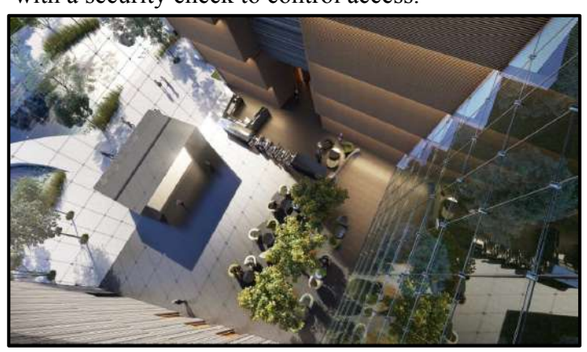
Gallery of TOHA Office Development
Ron Arad Architects - 50, n.d.

Area Analysis: Ground Floor (Space Relation)

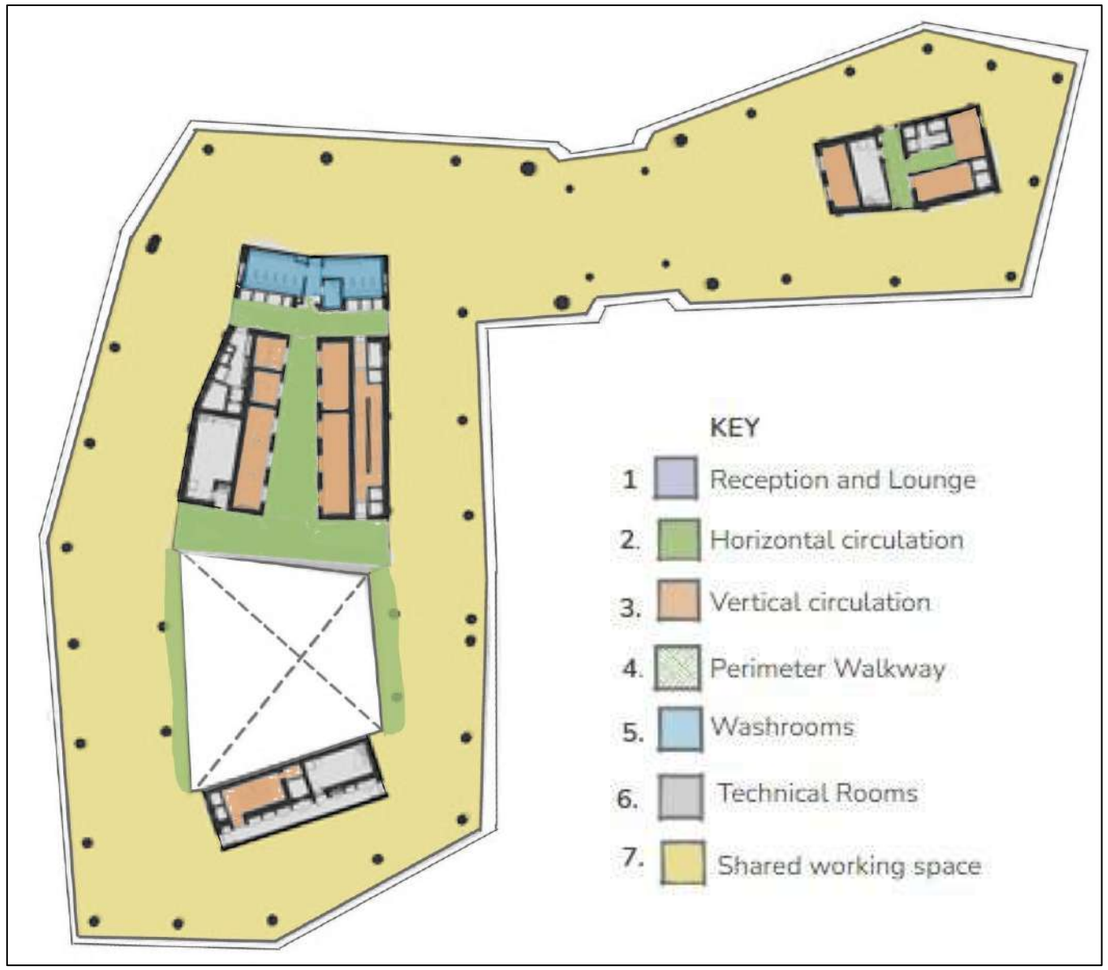


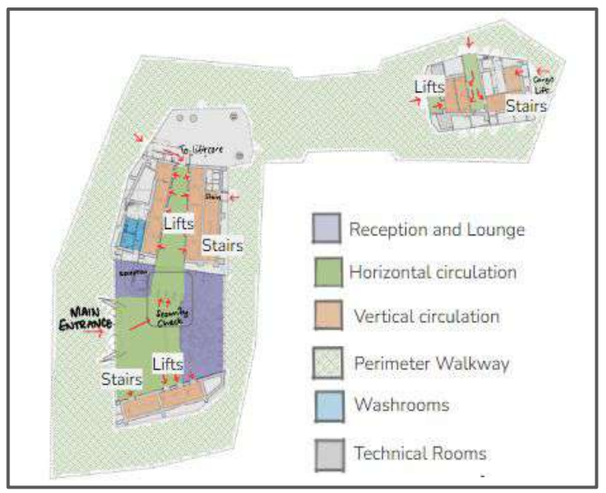
Gallery of TOHA Office Development
Ron Arad Architects - 50, n.d.

There is one main reception area in the ground floor, with a security check to control access.



Usa, C. (2022, March 28). Toha. Cosentino USA.





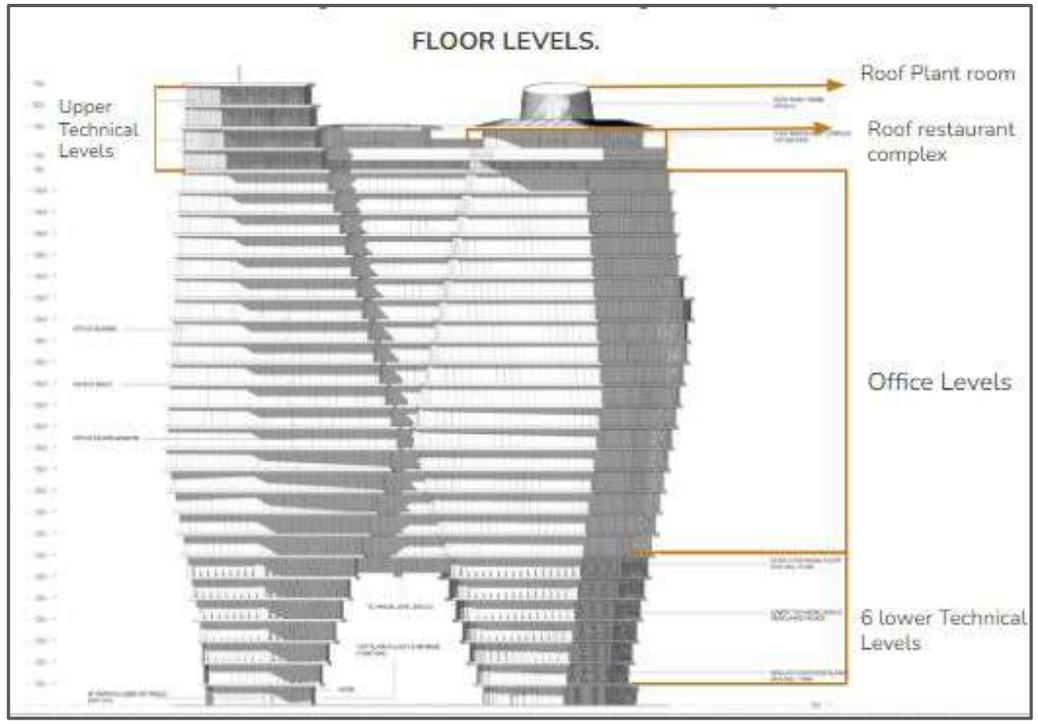
Usa, C. (2022, March 28). Toha. Cosentino USA.

Area Analysis : Circulation

The main entrance has 13 lifts and a staircase in close proximity to facilitate easy movement of people to the office floors above.
Horizontal circulation is mainly through the open-layout floor plans, with a well-lit corridor between the central lifts.

Area Analysis: Hierarchy of Spaces

The office spaces are arranged Around the core as well as the atrium. The cores being centralised In the wings allow for easy access to vertical circulation. The offices around the atrium receive good daylight ingredients from both sides of the facade.



Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

As opposed to having mechanical systems at the top of the building, most of the mechanical works are done on the lower 6 levels.
This leaves space at the rooftop To have public access. The roof level was then used host a public restaurant.

While no two floors are the same, there is sufficient consistency to enable flexible planning and varied sub-division possibilities.
The floors range in area from 1860m² to 3100m², and can be arranged as large open plans, or subdivided for up to seven tenants per floor.

Area Analysis: Ground Floor

SPACES	N.O OF SPACES	NUMBER OF USERS	FUNCTIONAL REQUIREMENTS	LAYOUT
1. Reception	1	2	Sufficient lighting, ventilation and circulation.	Open-plan layout
2. Waiting Area	1	18		
3. Perimeter walkway	1	Varied	Sufficient Natural lighting, ventilation and circulation.	Street Furniture (scattered along the perimeter)
4. Wash Rooms	2	3	Adequate privacy, lighting and ventilation.	Cubicles
5. Technical Rooms	2	Varied	Sufficient lighting, ventilation and circulation.	Partitioned

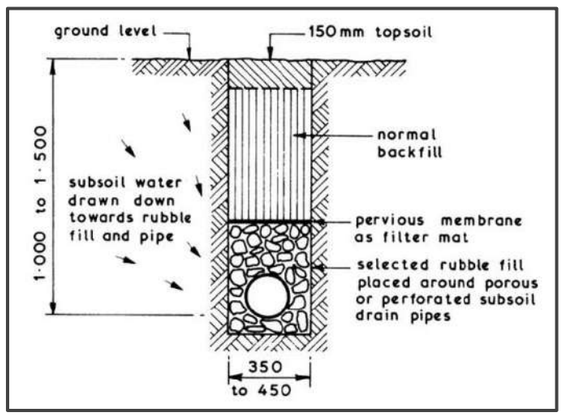
1. Shared working spaces	1	Varied	Sufficient lighting, ventilation and circulation	Open-plan layout
2. Technical Rooms	2	Varied	Sufficient lighting, ventilation and circulation.	Partitioned
3. Wash Rooms	3	6(ladies)+6(4gents &2urinals)+1(disabled) = 13	Adequate privacy, lighting and ventilation.	Cubicles

Technical Considerations

- **Site**
  - Water and Drainage
  - Landscape
- **Building**
  - Power Source and Lighting
  - Materials
    - Thermal comfort
    - Acoustics
  - Safety
    - Fire
    - Earthquakes
    - Winds

SITE:Water and Drainage

Sources ; Municipal water, rain water harvesting
Drainage: Finish grades sloped to drain surface water away from building to collection channel, flat roof drainage system, subsoil drainage are employed
Water efficiency is achieved through
Water use reduction - Uses fixtures, fittings and appliances that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation).
Innovative wastewater technologies - Reduces potable water use for building sewage conveyance by 50% through the use of water-conserving fixtures (e.g., water closets, urinals) or nonpotable water
Water efficient landscaping - Reduction is attributed to :
Install landscaping that does not require permanent irrigation systems,Irrigation efficiency, Use of captured rainwater,Use of recycled wastewater



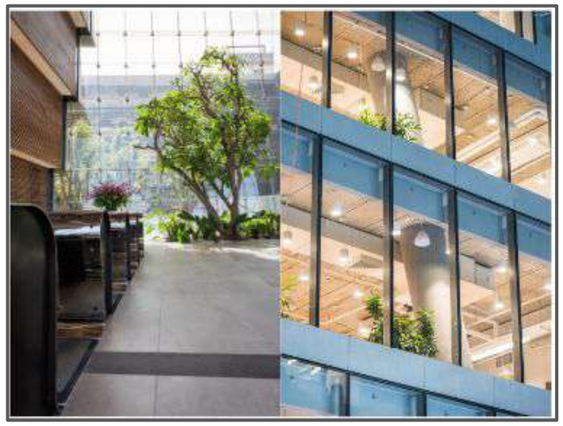
(*Laying Drainage Pipes in Lawn*, n.d.)

Landscape:Public Garden

Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

Landscape: Interior Plantscaping

Parts of the complex will be raised up on 'legs' containing technical plant areas, allowing the creation of gardens and plazas both around and under the towers



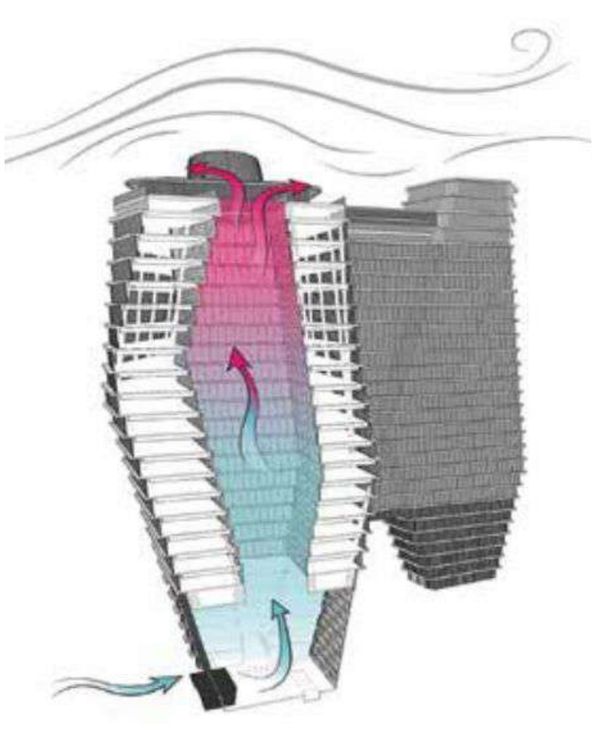
Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

BUILDING: Power Source and Lighting.

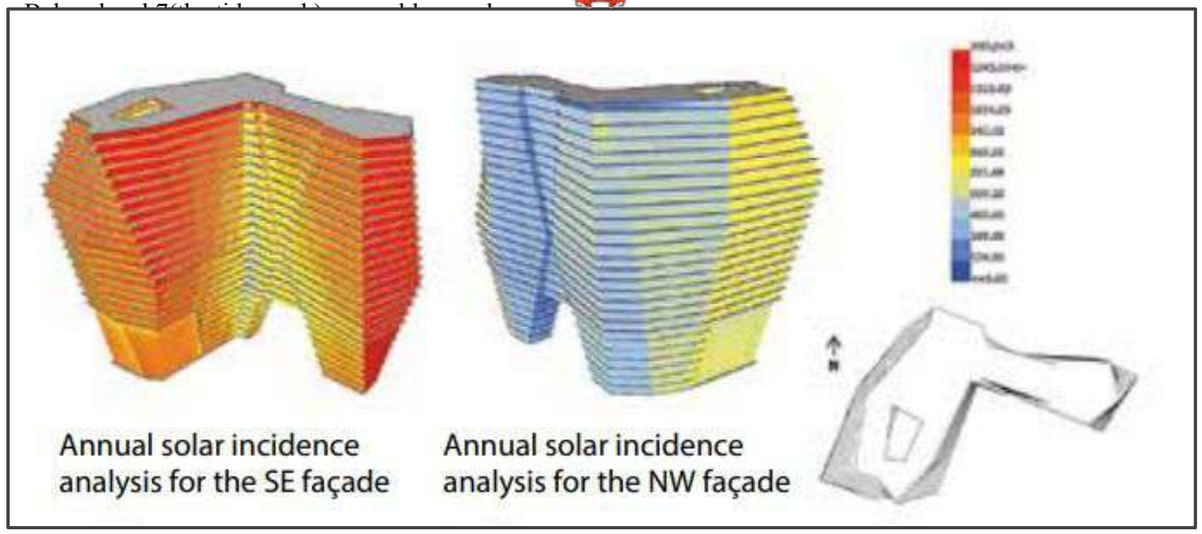
- The main source of energy for the building is the grid.
- The grid is supplemented by solar energy, through traditional passive solar designs I.e. maximizing daylights.
- The glazed and angled facades are carefully oriented to ensure that every desk within the general office space receives natural lighting.
- This allows for retention of a maximum of 93% solar daylight.
- Shading devices to manage solar gain.

Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

<u>BUILDING: Materials: Thermal Comfort</u>
The atrium helps cool down the buildings thermal mass through natural flow night flushing.
Shading devices.These building is shaded using shlab extensions/shelves.they protrude beyond the glazed facade.They are designed on the basis of solar incidence ,glare and daylight factor simulations to extend as little or as far as necessary(500-2000mm) in order to maximize passive self shading of the building

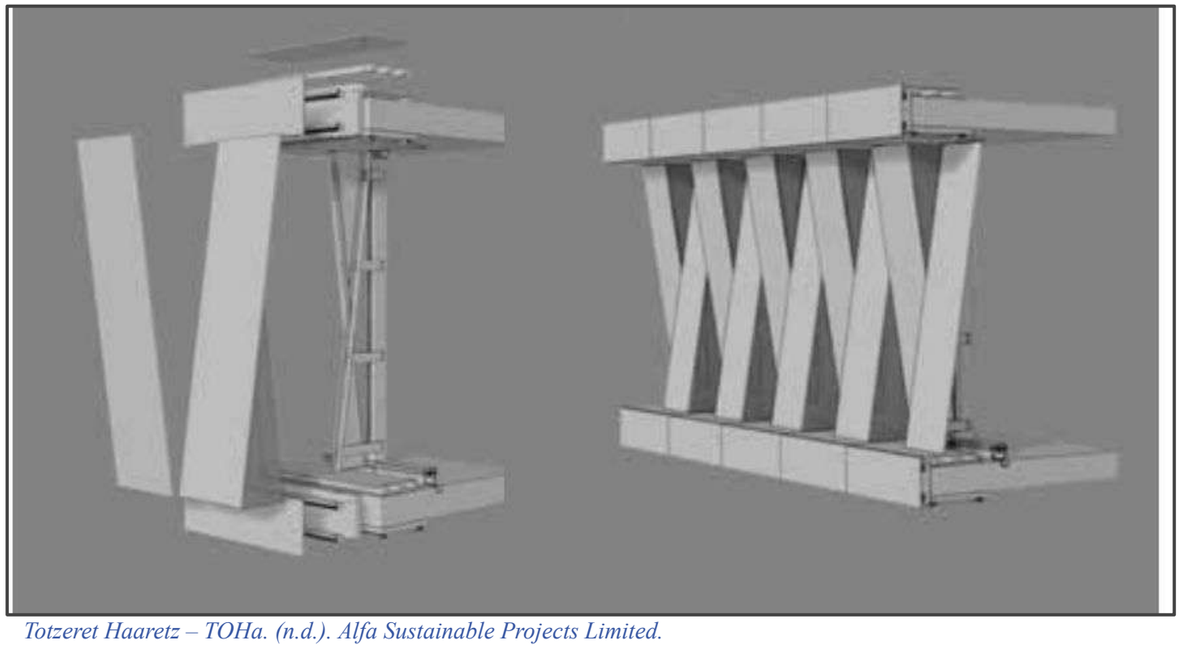


Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

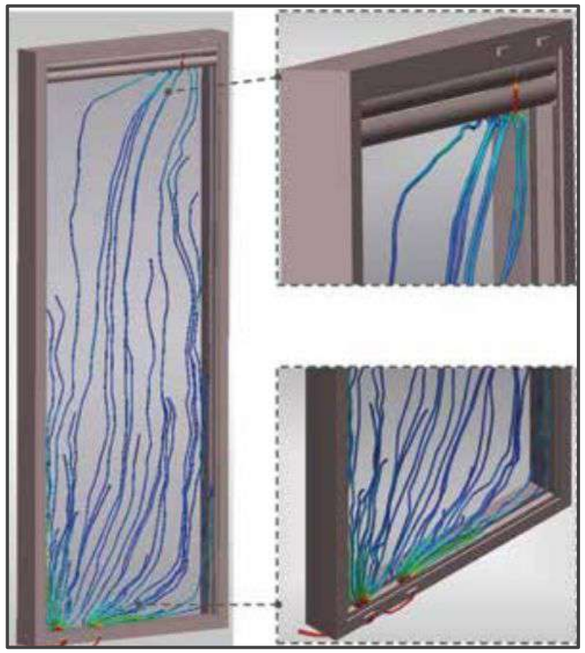


Below level 7(the tide mark)permeable panels are used to allow the building to 'breathe' providing fresh air intake for basement parking and offices .they are detailed with cross mounted panels ,creating an X pattern .

This woven-like arrangement was calculated to allow the required airflow and provide a coherent ,non mechanical aesthetic to the first seven floors of the building.



Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.



HVAC- the building has an automated air inlet system which periodically pumps air into the glazed cavity through small air inlets diffused at low velocities to the entire width of the module.Warm air exits at the top of the module through outlet openings.

Restriction of thermal gain within the offices, by using an energy-saving and responsive double-skin façade system

<u>ACOUSTICS</u>

<u>THE BUILDING ENVELOPE:</u>

- The building envelope is constructed using double glazed glass which absorbs and reflects noise from the outside environment.
- The facade glass has a high Sound Transmission Class (STC) ratings. STC measures a window's ability to block sound transmission.
- The facade is properly sealed preventing the entry of unwanted noise.

Acoustic partitions: made of fiberglass and fibre boards, were designed to absorb sound and reduce echoes within the spaces.
Sound diffusers: Integrated sound diffusers on walls to scatter or disperse sound waves, thereby reducing standing waves and echoes to improve sound clarity.
Noise Reduction in HVAC Systems:HVAC systems are designed to operate quietly, and use sound-attenuating materials in ductwork to minimize the transmission of mechanical noise.
Soft Flooring: The use of rubber flooring and carpets to absorb impact noise, reduce footsteps, and improve overall acoustics.
Ceiling Clouds and Baffles:suspended ceiling clouds and baffles were installed to break up sound waves and prevent them from bouncing around.
Acoustic Panels in Ceilings:Ceiling-mounted acoustic panels were installed to reduce sound reflections and prevent noise from bouncing off hard surfaces.
Furniture and Upholstery:Incorporated upholstered furniture and soft furnishings, as they can act as sound absorbers.

BUILDING SAFETY: Fire
Fire Safety requirements employed by the Polaris Building office space:

- **Fire detection and alarm systems**
  An advanced fire detection and alarm system covers all areas of the office space. The system is equipped with smoke detectors, heat detectors and automatic sprinklers to detect fires at an early stage. The alarm system with a central monitoring station for rapid response.
- **Fire resistant construction materials**
  - Concrete is the main building material for the wall construction, which is fire resistant
- **Emergency exits and evacuation routes**
  - Emergency exits, stairwells, and evacuation routes are clearly marked with exit signs. Exits are easily accessible, and in visible locations, providing guidance on evacuation routes and assembly points.
  - Push doors to facilitate is exit and evacuation
- **Fire suppression systems**
  - Gas Fire extinguishers are employed within the office spaces
- **Emergency Lighting**
  - Emergency lighting in corridors, stairwells to provide illumination during power outages.

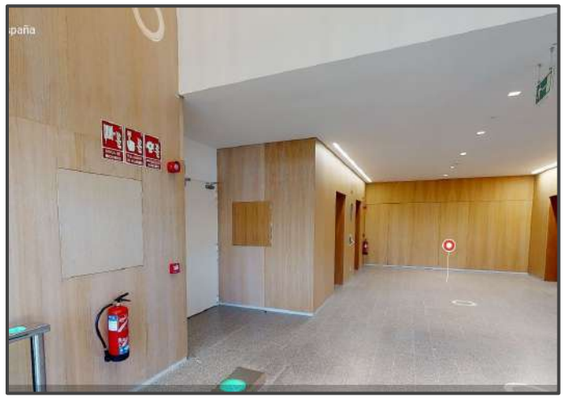
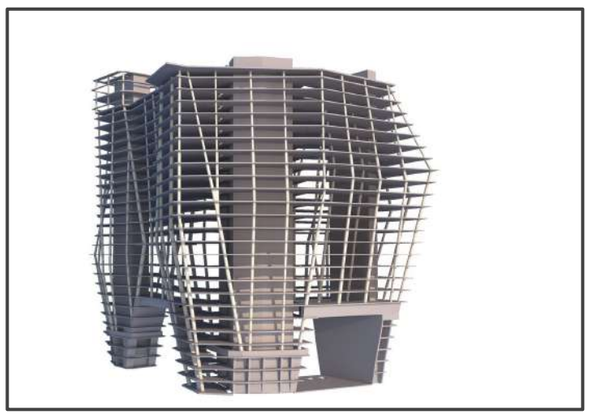


Image showing Fire Fighting in TOHA
Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

BUILDING SAFETY: Earthquake



- **Protection Against Earthquakes:** The design utilizes flexible and resilient building materials like reinforced concrete and steel to absorb and distribute seismic energy efficiently.
- **Isolating the Foundation:** Incorporate base isolation systems to isolate the building from ground motion during earthquakes, reducing the impact of seismic forces on the structure.

BUILDING SAFETY: Wind

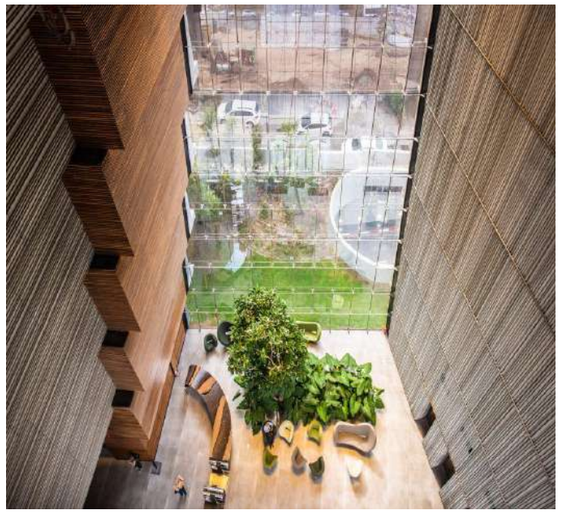


Image showing plants used in wind control in TOHA
(Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

- ***Wind-Resistant Glass***
  For windows, the use of laminated tempered glass with high wind resistance helped prevent breakage during strong winds.
- ***Wind Load Analysis***
  Engineers conducted wind load analysis to determine the expected wind forces on the building. This analysis helped in designing the structure and selecting appropriate materials to withstand these forces.
- ***Materials Selection***
  Materials with high wind resistance is crucial. This includes the selection of durable and wind-resistant materials like concrete, steel and other composite materials for the building envelope, such as windows, doors, and cladding.

Conclusion: Sustainability

Technologies
The lower technical floors are clad with a permeable facade of cross-mounted panels, creating an ‘X’ pattern. This woven basket-like arrangement allows for ventilation
Energy Efficiency:
33.7% energy cost savings: ToHa exceeds ASHRAE energy efficiency standards by a significant margin, achieved through measures like:
Closed-cavity façade: This unique system regulates temperature, reduces sunlight glare, and minimizes air conditioning needs.
Energy-efficient appliances and lighting: LED lighting and smart systems reduce energy consumption.
Automatic controls: Sensors optimize lighting and HVAC usage based on occupancy and daylight levels.

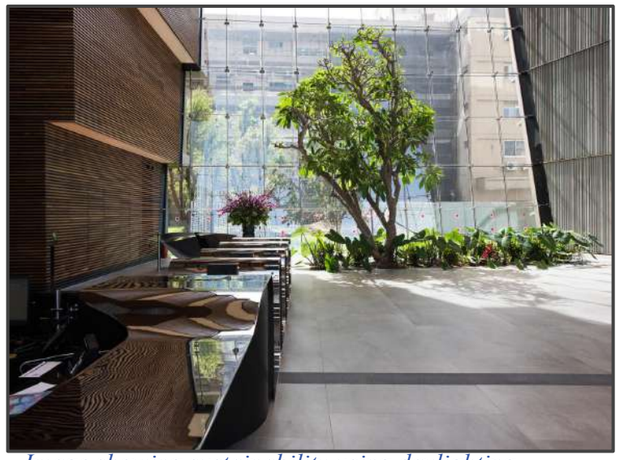


Image showing sustainability using daylighting
(Totzeret Haaretz – TOHa. (n.d.). Alfa Sustainable Projects Limited.

Conclusion: Environmental Considerations
Environmental approach fuses traditional regional passive solutions, with state-of-the-art energy saving and intelligent facade systems.

- **Green landscaping**: Native and drought-resistant plants minimize water demand and attract pollinators.
- **Sustainable transportation:** Bicycle parking, electric vehicle charging stations, and proximity to public transit promote eco-friendly commuting.
- **Indoor environmental quality:** Natural ventilation, optimized air filtration, and ample daylight create a healthy and comfortable working environment.

Conclusion: Functional Design

Shared Spaces:

- Open floor plans: The building features open floor plans in common areas like lobbies and workspaces, fostering collaboration and interaction among occupants. The open design also allows for flexibility in furniture layout and adaptation to different uses.
- Multifunctional spaces: Some shared spaces can be transformed for various purposes, maximizing space utilization and reducing the need for dedicated rooms for specific activities. For example, a rooftop terrace can serve as a meeting space, relaxation area, or outdoor event venue.
- Accessible and inclusive design: The building ensures accessibility for people with disabilities through features like ramps, elevators, and accessible restrooms. This inclusivity creates a more comfortable and welcoming environment for all users.

(Office Hub, n.d.)

Acoustics and Insulation:

- Sound-absorbing materials: Ceilings and walls in shared spaces incorporate sound-absorbing materials to minimize noise pollution and improve acoustics for clear communication and concentration.
- Operable windows**:** Windows in shared spaces can be opened to allow natural ventilation and reduce reliance on mechanical systems, further improving acoustics.
- Double-glazed windows**:** The building's exterior uses double-glazed windows to provide sound insulation from outside noise, creating a quieter and more comfortable environment.

Comfortable Environment:

- Natural light and ventilation:
  The building prioritizes natural daylight and ventilation through strategic window placement and open floor plans, improving employee well-being and reducing energy consumption.
- Green spaces**:**
  Rooftop and ground-level gardens provide visual and physical connection to nature, reducing stress and improving air quality.
- Thermal comfort**:**
  The building's passive design elements, such as thermal mass and shading, help maintain comfortable temperatures throughout the year, minimizing reliance on air conditioning.

Example of comfortable office space (Office Hub, n.d.)

Example of comfortable office space (Office Hub, n.d.)

Conclusion: Waste management Suggestions

Waste management in a large office with over 100 users involves key considerations for a clean and efficient environment. Here's a simplified breakdown:

Sewage Systems:
Connect to municipal sewer lines for proper waste disposal.
Collaborate with civil engineers for an efficient sewer system to handle waste from many users.

Smart Restroom Design:
Design restrooms with a practical layout for privacy, accessibility, and ventilation.
Use hands-free fixtures like sensor-operated faucets to enhance hygiene.

Sustainable Sanitary Solutions:
Specify water-saving toilets and urinals to reduce water consumption.
Explore greywater recycling systems to reuse water for flushing, promoting sustainability.

Odor Control Mechanisms:
Integrate ventilation systems for fresh air and odor control.
Consider air purification technologies for improved restroom air quality.

Occupancy Monitoring Systems:
Use smart sensors to monitor restroom usage, optimizing cleaning schedules for consistent sanitation.

Accessibility and Inclusivity:
Design restroom facilities with universal accessibility in mind, catering to users with diverse abilities.

Maintenance Access:
Plan for easy access to plumbing for regular maintenance and quick issue resolution.

Integration of Sustainable Materials:
Choose non-porous materials for easy cleaning, reducing bacterial growth.

By incorporating these measures into the architectural design, the office space can create a clean, water-efficient, and user-friendly environment, promoting the well-being of its occupants.

References

A. South Africa Case Study:

- I-CAT Building - South Africa
- https://www.archidatum.com/gallery?id=14050&node=14030
- I-CAT starts construction of environmentally sustainable office building in Pretoria, SA
- I-CAT Offices and Warehouse / Earthworld Architects |
- A roof overhang over the north-facing windows of the I-CAT office block shades the building during summer and
- https://www.archidatum.com/gallery?id=14050&node=14030
- https://www.b2bcentral.co.za/20152016-afrisam-saia-award-for-sustainable-architecture-innovation-final-qualifying-entries/
- https://www.slideshare.net/slideshow/njk43101/229228814
- https://www.ewarch.co.za/post/2337/cat-eco-factory/

B. Israel Case Study:

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- https://www.arch2o.com/toha-ron-arad-architects/
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- https://alfaprojects.co.il/project/totzeret-haaretz-toha/

PART II: SITE ANALYSIS

TOPICAL CUES ON SITE ANALYSIS

In order to maintain accuracy of the originally intended meanings and retain authenticity, materials obtained from online sources and published references are kept in their original text and acknowledged accordingly.

An introductory lecture by: Dr. Arch Rehab Hamdi Elnaggar(PhD), EES, Year Master, B. Arch IV, Department of Architecture and Interior Design.

TOPICAL CUE

An introductory lecture by: Dr. Arch. Rehab Elnaggar, Lecturer

Site Analysis

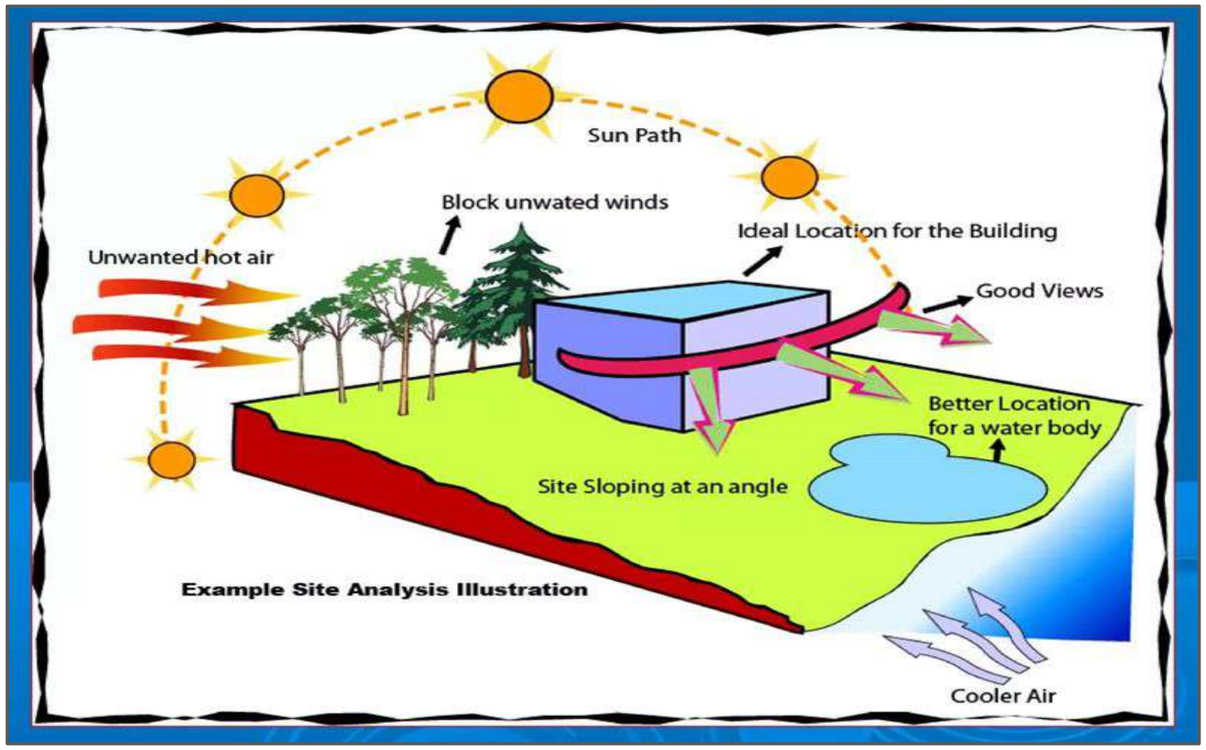

Image source: (Sabeer Hamid, 2018)

Goals of Site Analysis

- To Achieve a successful design Site analysis is a must & should be done carefully.
- Site analysis involves taking inventory of site elements and analyzing these factors relative to the clients needs & aim.
- Gathering relevant information about the site.
- Analyze these Features and incorporate them into the design

A. Natural features

1. Climate

A. North Direction
B. Precipitation
C. Wind Direction
D. Solar Intensity
E. Precipitation
F. Average/ Highest/ Lowest Temperature

2. Topography

3. Vegetation

A. Type, Size, location,
B. Shade pattern,
C. Aesthetics , Ecology…..

B. Accessibility

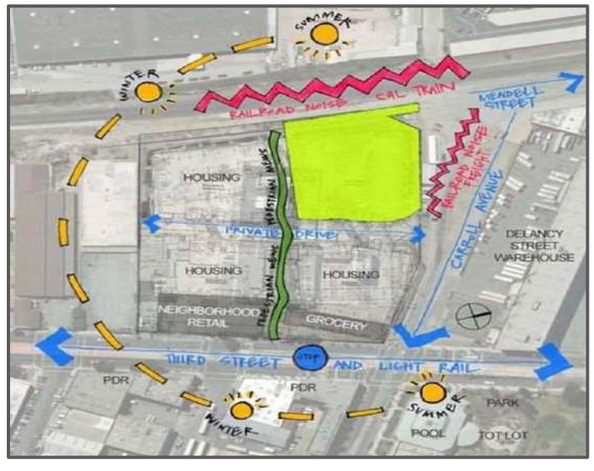

Image source: (Sabeer Hamid, 2018)

C. Site Surrounding

District Character
LandMarks
Building heights

D. Surrounding Activities

Architectural Style
Attraction Buildings /point
Nodes

Site Surrounding Context

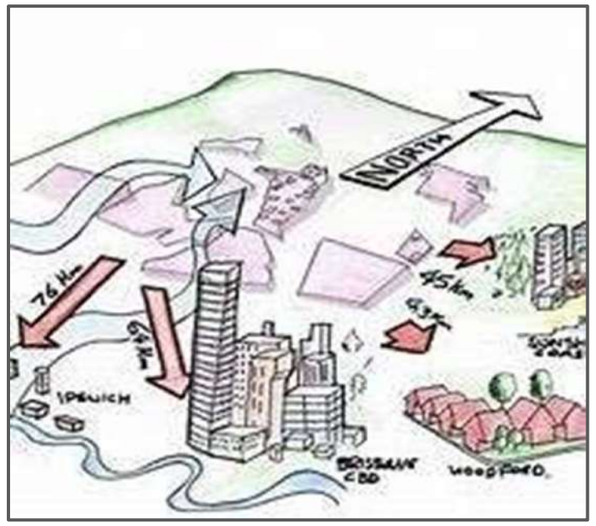

Image source: (Sabeer Hamid, 2018)

E. Utilities

Sanitary
Water Supply
Electrical
Gas

F, Site Regulation

Setback
Height

ADD

Analysis
Discussions
Decisions

AIM

- To Attract and compete in the Global market.
- This require a good, updated, Contemporary, well equipped Design.
- To match and meet all expectation.
- To host and welcome all users from different cultures and backgrounds within the Kenyan Identity
-

Your Building is a message to the Future…

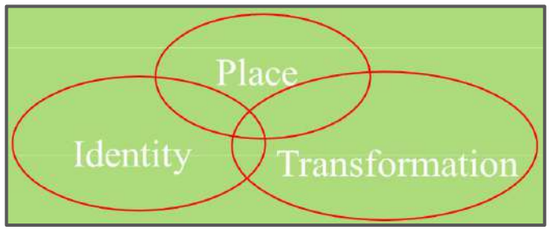

Image source: (Sabeer Hamid, 2018)

Main Aspects of Design

- Social
- Cultural
- Technological
- Environmental
- Psychological
- Technical

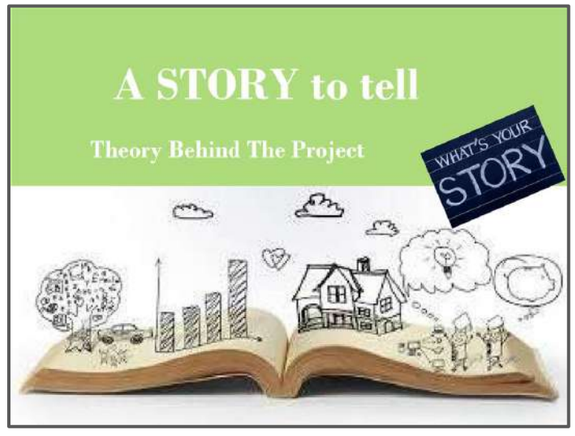

Image source: (Sabeer Hamid, 2018)

PROPOSED SITE LOCATIONS

The proposed location pins:

Westlands
https://maps.app.goo.gl/1qqD7hrEgoGqJhAQ6

Tigoni
https://maps.app.goo.gl/CvcsU6nZdyFZXz5A6?g_st=iw

Parklands
https://maps.app.goo.gl/dWg88spS5NSMT9sr7?g_st=iw

WESTLANDS SITE

B.A.S YEAR IV CONTRIBUTIONG STUDENT RESEARCHERS AND DESIGNERS - 2023/24

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John Mwambamba
Maina Wairimu
Mary Koinange
Mwendwa Mutunga
Nick Marete
Omondi Charles
Patrick Njuguna
Wanjeri Njau
Yegon Chebet

WESTLANDS, NAIROBI.

Aerial Photograph of Westlands
(Nairobi |Projects and construction, 2011)

Westlands, a lively neighborhood in Nairobi, Kenya, is known for its entertainment scene and mix of residential and commercial spaces. It houses popular shopping malls like Sarit Centre and Westgate, as well as upscale hotels like Sankara and Villa Rosa Kempinski. The area hosts embassies, business centers, and schools. Westlands is an upper middle-class and wealthy district, attracting residents seeking a vibrant lifestyle. Nearby Muthaiga is considered the country's most affluent neighborhood

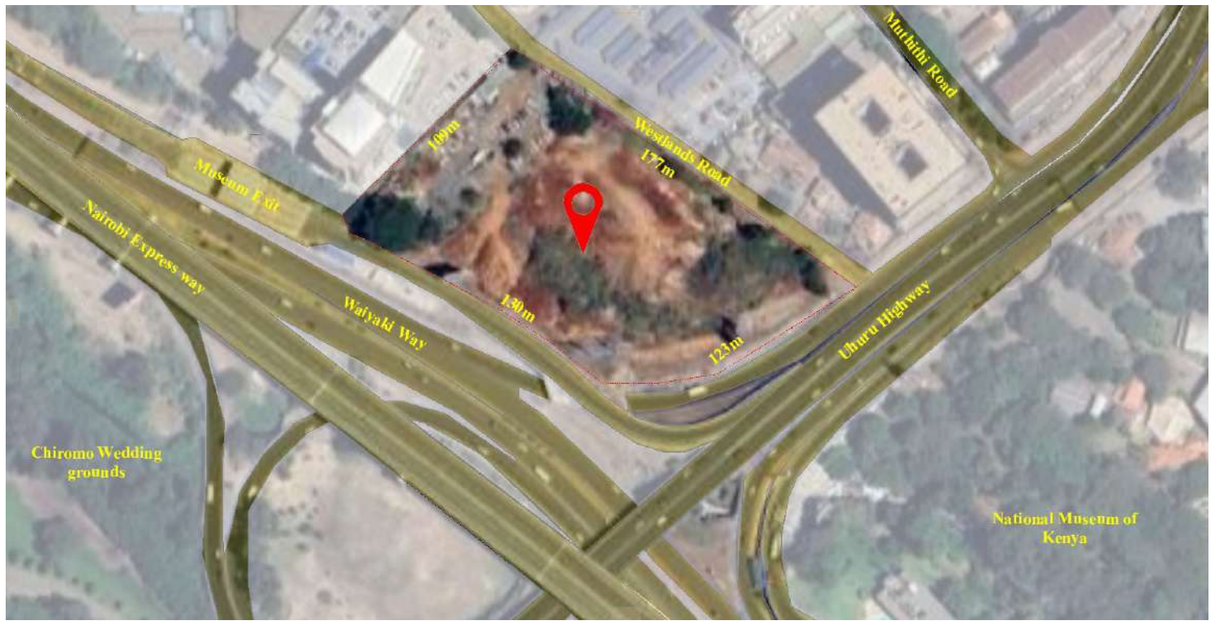
Size

The site takes a trapezoidal shape with an area of 4.76 Acres

Site conditions

The site currently hosts temporary structures utilized as small restaurants, alongside functioning as a parking lot and car wash. Additionally, mounds of soil are present, likely originating from neighboring construction activities. A few scattered trees and shrubs are present on the site.

Photograph of the site
(B.A.S. Year IV contributing authors, 2024)



Map of Site and surrounding roads, Nairobi Expressway, Waiyaki way and Uhuru Highway
(*Google Maps*, n.d.)

The Site

Satellite image showing site and context
(*Google Maps*, n.d.)

location

The plot is situated in Upper Parklands. The site is approximately 3 Km form the Nairobi CBD. It is found along Westlands road and opposite the Nairobi National Museum.

Site suitability for the 3 proposed developments

Parameter	Office Building	Commercial Building	Sports Complex
Adjacent Buildings	**Highly Suitable** The office occupancy levels in Nairobi have experienced a decline of 3.9%, dropping to 71.5% from the 74.9% recorded in 2022. This decrease can be attributed to over 600,000 sq ft of grade A office space coming onto the market in 2022 (e.g GTC mentioned in the neighborhood section.. Putting up a grade A office building would draw in multinational company users being that the Westlands district is the most sought after office location.	**Less Suitable** Given the presence of several major malls, such as Sarit Centre and Westgate, which are already popular with the local population, it may be difficult for the client to break into the commercial market in this area. As of 2023, the average occupancy rate for retail spaces in Westlands is 77.6%. With demand slightly below supply, this venture appears less feasible.	**Suitable** Being that the closest sports facility is in Parklands, having one established in the westlands business district would prove fruitful. With none in the region, market demand is assured from the large working class population coming in from different parts of the city as well as the local community (huge residential base in the area).

WESTLANDS, NAIROBI.

Site Access

The site is approx **3km from the CBD** and is **accessible via the Westlands Rd.**

1. **From Westlands;**

Accessed through **Waiyaki Way**, approximately 150m past the museum hill expressway toll exit:

- Take a left onto Uhuru Highway for about 130m
- Then Take a left onto the Westlands access rd.

2. **From Thika Rd'**

Accessed via either **Kipande Rd., Ngara Rd. or Limuru Rd**. which all lead to Uhuru Highway:

- Proceed on to Ojijo Rd.
- Take a left on the Chiromo Lane intersection. Head straight up until the Westlands Rd. intersection and take a right towards the site access gate.

Alternatively:

- Proceed along Uhuru Highway before taking a right onto Waiyaki Way.
- Head towards Westlands up until the 1st U-turn and drive backwards onto Uhuru Highway before branching into Westlands Rd.

Circulation

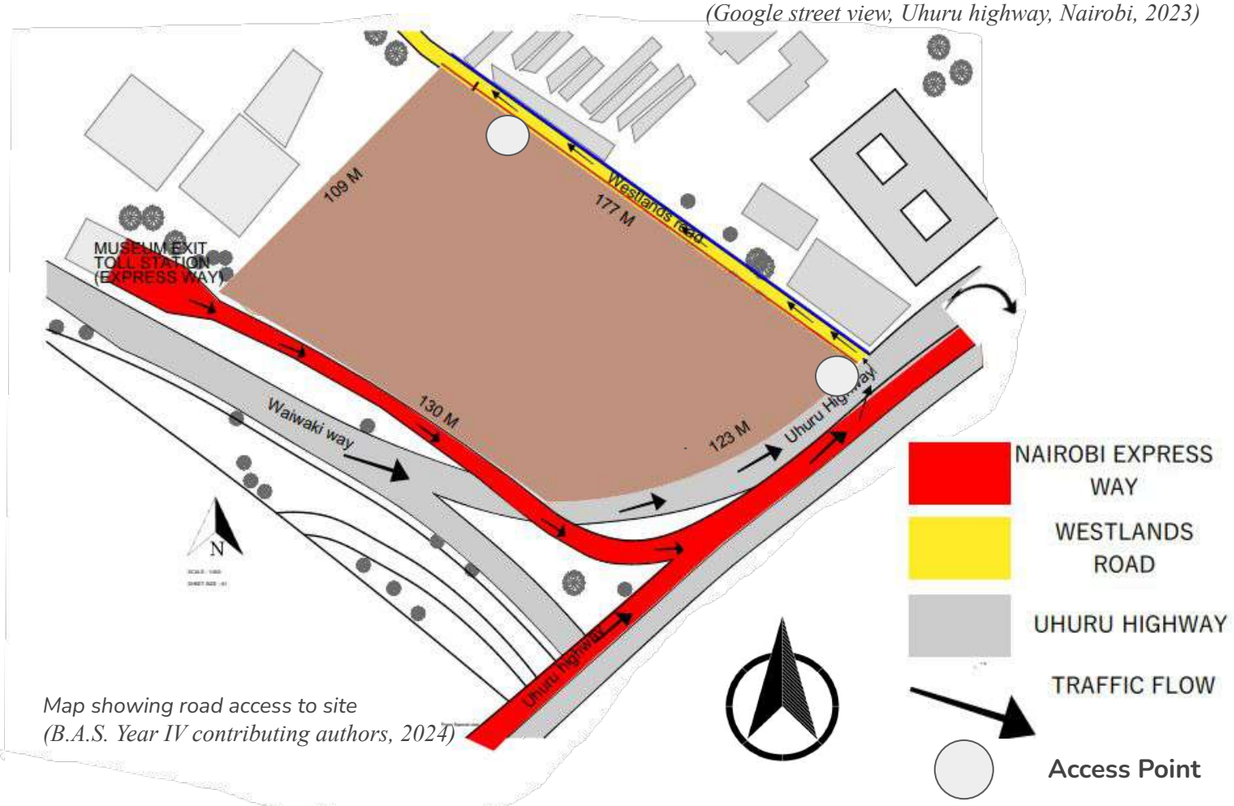
3 sides of the site are bordered by access roads:

- 6m wide Westlands Road
- 50m wide Uhuru highway
- 30m wide Museum exit and Waiyaki way

Pedestrian footpaths are found along Westlands Road

Access Road: Westlands road
(Google street view, 62 Westlands Rd Nairobi, 2023)

Access Road: Uhuru Highway
(Google street view, Uhuru highway, Nairobi, 2023)



Map showing road access to site
(B.A.S. Year IV contributing authors, 2024)

Access points

The site features 2 unique access points, accessible through **a small gate**.
It is partially enclosed by a temporary corrugated iron sheet fence along Westlands Rd, guiding visitors towards the primary access gate designed for both vehicular and pedestrian entry.
Access from the South/Southwest end is limited to pedestrians only. This restriction is in place due to the presence of heaps of dumped soil on the site, hindering vehicular transit.

Access Point 1: Westlands road
(Google street view, 62 Westlands Rd Nairobi, 2023)

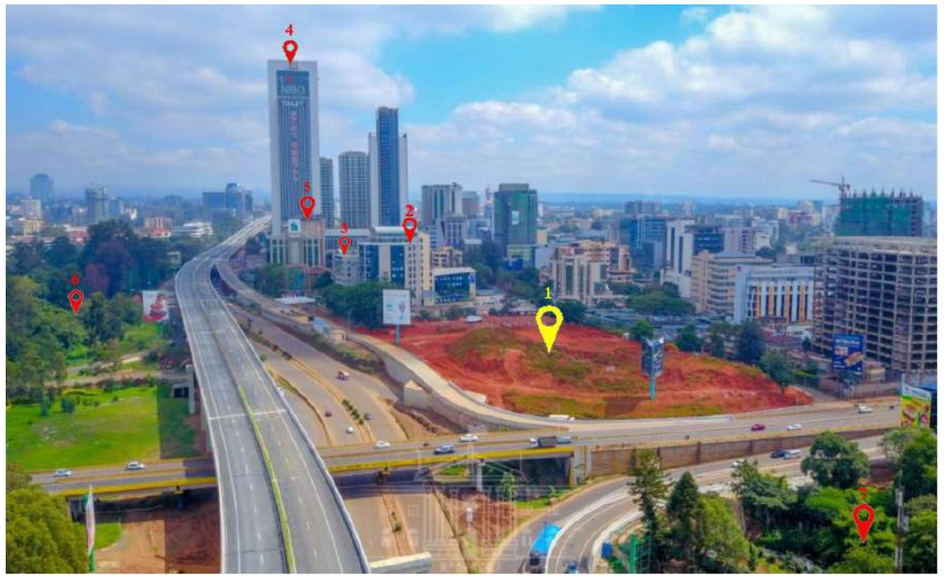
Access Point 2: Westlands road
(Google street view, 62 Westlands Rd Nairobi, 2023)

Access Point 3: Westlands road
(Google street view, 62 Westlands Rd Nairobi, 2023)

Access suitability for the 3 proposed developments

Parameter	Office Building	Commercial Building	Sports Complex
Access	**Highly suitable** The site is accessible by major roads (Waiyaki Way, Thika Rd. etc) making it suitable for a wide range of users in the Nairobi Metropolitan area Westlands Rd. being the main access route to the site offers wide enough access (6m road) capable to serve the traffic brought on by such a development	**Suitable** With the site's access being a secondary road rather than a feeder road branching of the main highways, motorists driving through might find it challenging to access and exit the development with ease To make it more suitable, multiple access points might have to be introduced along the main highways. This would even help ease up the huge traffic exhibited on such developments	**Less suitable** Such developments draw in crowds often in-transit with buses and vans. Westlands Rd. being the main access route to the site offers narrow width clearance access (6m road) needed to serve the huge traffic anticipated to be brought by such a development especially when hosting competitions. Navigating around for the users would be difficult making it less desirable

The Neighborhood



1. Site
2. Purshottam place
3. Stanbic HQ
4. GTC Tower
5. Villa Rosa Kempinski
6. Chiromo Wedding Grounds
7. National Museum of Kenya

Site and neighboring buildings
("Africa:Taking a Toll-Lessons From Nairobi's Expressway" 2023)

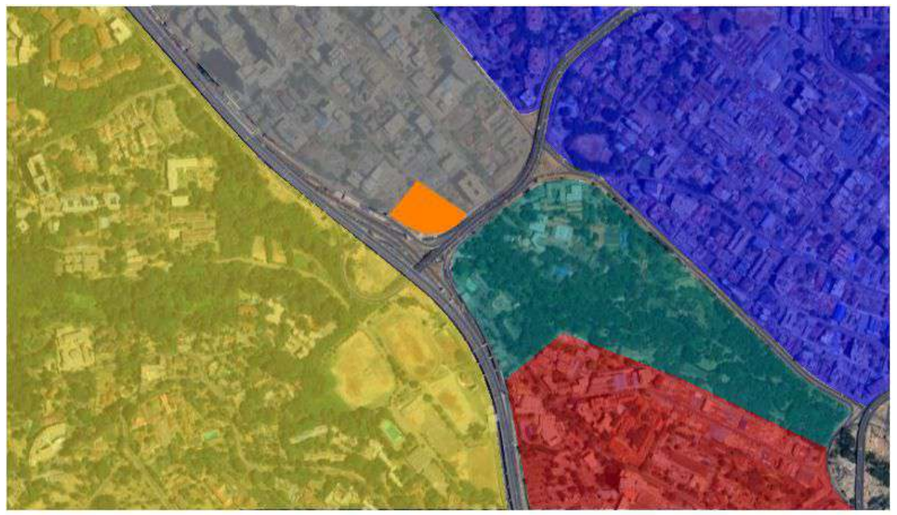
History
Westlands, Nairobi, transformed from rural farmland into a residential suburb during British colonial rule, attracting affluent residents and expatriates seeking suburban living close to Nairobi central business district. Over time, it evolved into a bustling commercial center with shopping centers, restaurants, and entertainment venues. Today, it's known for its vibrant cultural scene, diverse population, and thriving business district, with ongoing efforts to preserve its historical legacy amid rapid urbanization.

Site Context
the plot is located in a commercial zone characterized by office buildings.
Other neighbouring zones include a residential zone (parklands), an educational Zone (state house Girls and The University Nairobi), a recreation Zone(national museum)

Some notable landmarks in the area include:
-Villa Rosa kempinski
-Purshottam place
-Stanbic Headquarters
-GTC Towers
-State House Girls
- National Museum of Kenya

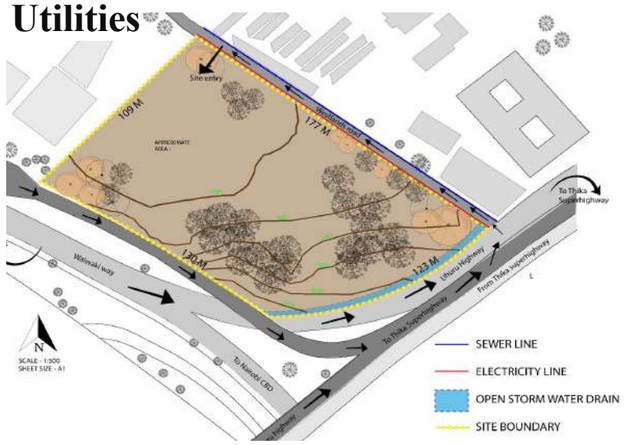
Building Regulations

Type of development	G.C %	P.R %
1. Block 1 Commercial	80	200
2. Block 2&3 Offices & High Rise Residential	35	80
3. Block 4 Offices	80	200
4. Block 5 Commercial/ Residential Hotels	80	200



Land uses around the site
(Google satellite map data,& B.A.S. Year IV contributing authors, 2024)

Utilities



Available utilities on site
B.A.S. Year IV contributing authors, 2024

Drainage: Site has access to City Council drainage system for rainwater management and flood prevention.

Water Supply: Relies on Nairobi Water for water supply, transported by road, potentially leading to supply inconsistencies and higher costs.

Electricity: Well-connected to power grid, with electricity lines running along Westlands Road.

Street lighting: Street lights are found along All the roads bordering the site

Aesthetics

The larger Westlands is distinguished by its modern skyline filled with sleek skyscrapers, contemporary office buildings, and high-rise apartments, such as the iconic Delta Towers and Kempinski Hotel.

Amidst this urban landscape, the district also features lush green spaces like Karura Forest and tree-lined streets, providing a harmonious blend of modern architecture and natural beauty.

The site offers delightful panoramic views of the Museum Hill Expressway Super Junction and the surrounding greenery, including John Michuki Gardens, the University of Nairobi sports grounds, and the Nairobi Arboretum.

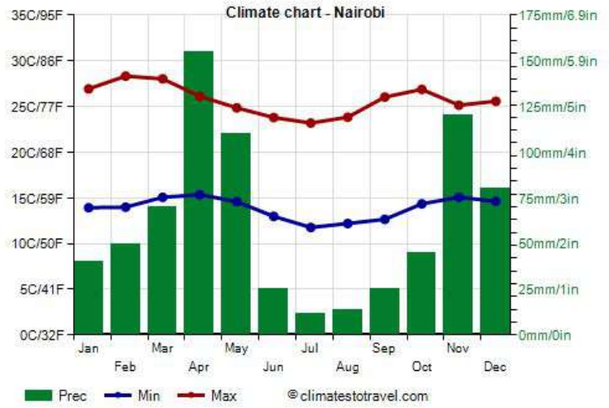
Purshottam Place - Contemporary Architecture
(Business Center for Rent on Purshottam Place, Chiromo Road, PO Box, Nairobi, 2024)

GTC Towers- Contemporary Architecture
(Capital FM Kenya, 2023.)

Villa rosa Kempinski - Contemporary Architecture
(Netherken Safaris & Tours, Kenya, 2022.)

The Environment

Climate

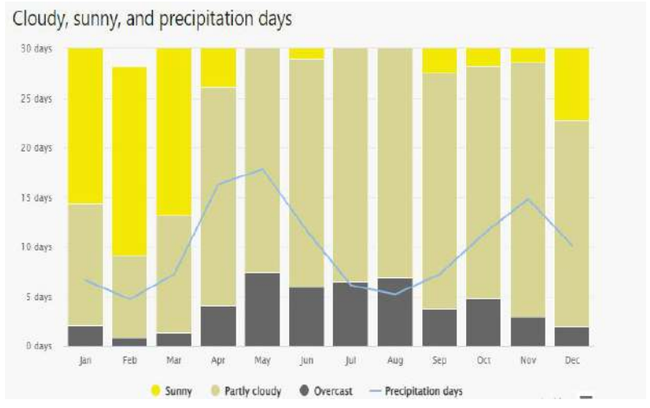


Westlands Climate chart
(climatestotravel.com,2024)

Westlands features a subtropical highland macro climate with:
Two rainy seasons from March to May and October to December,.

February has the highest daily sunshine hours, averaging 11.41 hours per day, and is the warmest month with an average temperature of 27.4 °C. May has the least sunshine, averaging 10.93 hours per day, while July is the coldest month with an average temperature of 13.3 °C.

The predominant wind direction from the northeast to the southwest at an average speed of 4.3 km/hr.
The climatic conditions are fairly comfortable for residents of Westlands.



Sun Path on site
(3D Sun-Path, 2024.)

Scan for sun path simulation

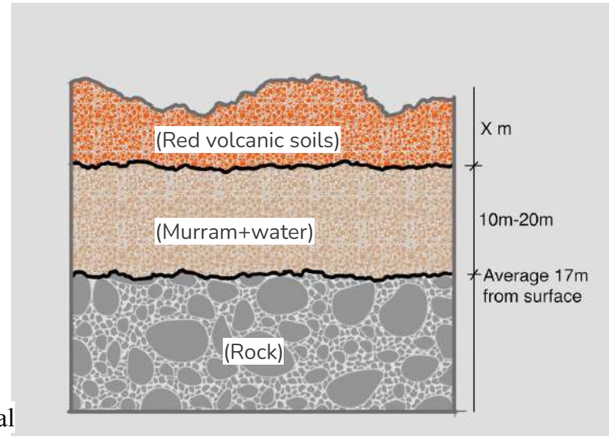
Vegetation

On-Site Vegetation
(B.A.S. Year IV contributing authors, 2024)

The site's vegetation is average, characterized by a few scattered trees and patches of grass. Similarly, the general area of Westlands also exhibits average tree coverage, with trees scattered throughout the landscape enhancing the aesthetic appeal.

Topography

The site features a 6% downward slope from north to south, with existing stormwater drainage provided on the southeastern end. The site is mainly covered by Tertiary volcanic materials overlying folded Precambrian Basement System rocks of the Mozambique belt. Weathering has resulted in the reddish-brown color. The soil is well-drained.



Site soil Profile
(B.A.S. Year IV contributing authors, 2024)

Site Conditions weather conditions
(Google satellite map data,& B.A.S. Year IV contributing authors, 2024)

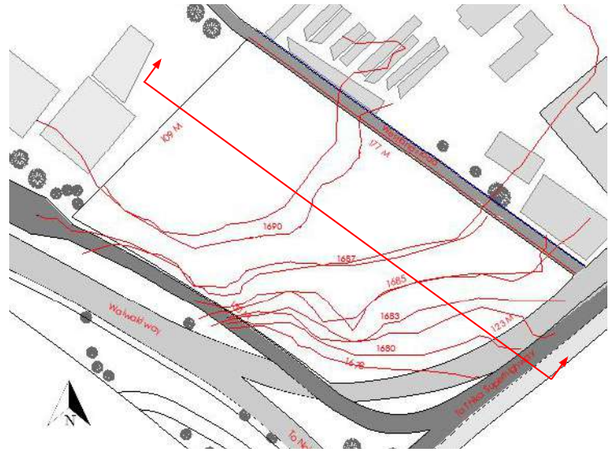
Air Pollution from vehicle emissions and bad odour from Nairobi River

Direction of wind

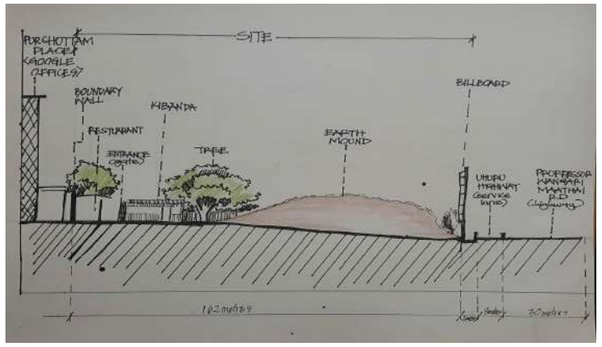
Nairobi River

Sun Path

Noise from traffic



Site Topography
(B.A.S. Year IV contributing authors, 2024)



Site section
(B.A.S. Year IV contributing authors, 2024)

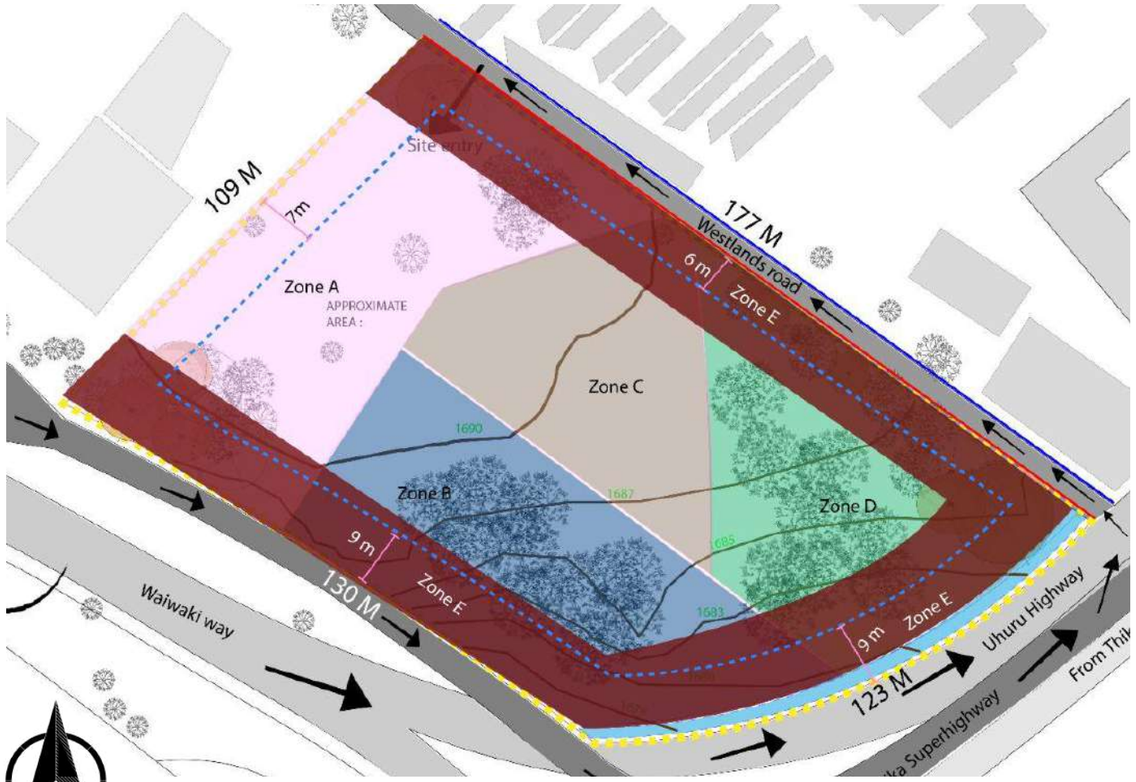
Mounds of soil on site
(B.A.S. Year IV contributing authors, 2024)

Pollution

Air pollution at the site primarily stems from vehicle emissions due to its proximity to an extensive road network. Additionally, the polluted Nairobi River, which runs adjacent to the site, contributes to unpleasant odors.

Noise pollution is predominantly caused by traffic, affecting both the site and the broader Westlands area.

SITE ZONING



Site Zoning
(B.A.S. Year IV contributing authors, 2024)

ZONE A.
- Topography - Flat
- Noise Level - Low
- Vegetation - Clustered in the SW & NE
- Neighbourhood - Perimeter wall boundary in the NW creating a set-back of 7m

ZONE B.
- Topography - 11 % Slope to the South
- Noise Level - Buffered by vegetation hence Low
- Vegetation - Dense Cluster
- Neighbourhood - Main roads in the South & SE creating a set back of 9m

ZONE C.
- Topography - 2 % Slope to the South East
- Noise Level - Mild levels from NE
- Vegetation - none
- Neighbourhood - subsidiary Road to the North

ZONE D.
- Topography - 10 % Slope to the South East
- Noise Level - Buffered by vegetation hence Low
- Vegetation - Dense Cluster of Shrubs
- Neighbourhood - Main roads in the SE creating a set back of 9m

ZONE E.
- Noise Belt

S STRENGTHS

Comfortable climate: Allows for optimal natural ventilation and lighting.
Good road connectivity: Facilitates construction and access, influencing entrance and exit placement.
Available utility services: Ensures smooth integration of essential systems like plumbing and electricity.
Pleasant views: Supports the inclusion of large windows, balconies, and outdoor spaces.
Well-drained: Prevents water issues, ensuring a solid foundation and enabling landscaping.

W WEAKNESS

Proximity to Waiyaki Way and Uhuru Highway, major sources of noise: This will require soundproofing measures and strategic placement of quieter spaces within the building.
The polluted Nairobi River emits a foul smell on site: Ventilation systems and odor control strategies will be necessary to mitigate the smell.
The site lacks a tapped water connection: Alternative water solutions, such as rainwater harvesting and water storage systems, will need to be incorporated into the design.

O OPPORTUNITIES

Daylighting: Receives adequate sunshine throughout the year, allowing for effective natural lighting.
Passive design: The micro and macro climate is within the comfort zone, enabling the use of passive design strategies for climate control.
Renewable energy: Adequate sunshine allows for harnessing solar energy.
Iconic design: Prime location with desirable views from adjacent roads, supporting an iconic architectural design.

T THREATS

Solar heat gain: Long hours of sunshine will require measures to manage solar heat gain
Wind movement: The adjacent northern site will disrupt wind flow on the site.
Traffic congestion: The narrow access road (Westlands Road) will complicate two-way traffic flow.

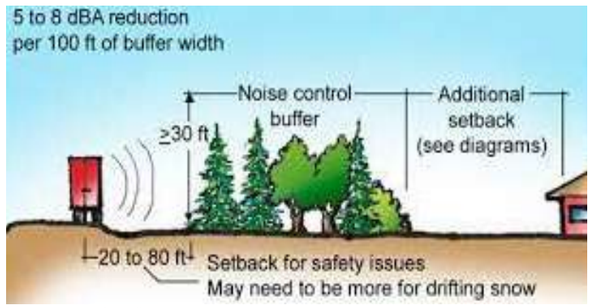
Design Recommendations

1. Noise and bad odour buffer Zones

It involves the dense plantings of shrubs and trees, layered vegetation, and incorporating earth berms or fences. Evergreens like pines reduce noise, while odor-absorbing plants such as junipers and lavender control smells.

Effective strategies include windbreaks, vertical gardens, and regular maintenance, with a preference for native species to ensure robustness and low upkeep.

The design should balance functionality with aesthetics and consider water management and environmental benefits.



Vegetation buffering
(Bentrup, 2015)

2. Building form and Height

The proposed building's height should complement existing structures and contribute to defining the skyline, maximizing the site's commercial potential. Additionally, the building's form and architectural style should harmonize with the prevailing architectural trends in the area.

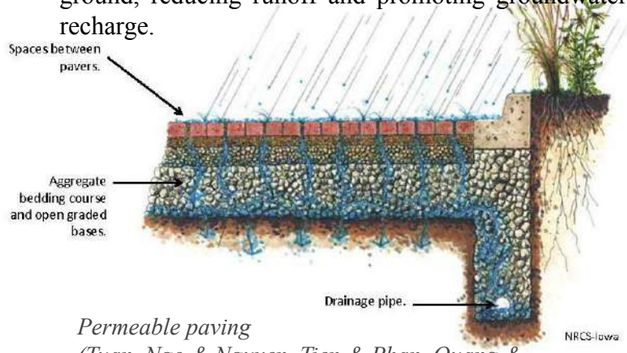
Westlands skyline
(Architectural Photography | Nairobi | Eyeconic Media, 2023)

3. Stormwater Management

Integration of **stormwater drainage** channels into the site is important to effectively redirect rainwater, thereby minimizing overall runoff from the site.

Storm drainage
(Modelling of Grassed Road Divider as Bioretention System for Urban Road Drainage, convectional road drainage,2023)

Permeable paving using materials like pervious concrete or interlocking pavers with gaps filled with gravel or grass, allows rainwater to infiltrate into the ground, reducing runoff and promoting groundwater recharge.



Permeable paving
(Tuan, Ngo & Nguyen, Tien & Phan, Quang & Nguyen, Van & Kawamoto, Ken. 2020).

Stormwater harvesting can be employed**.** It involves capturing rainwater through methods like rain barrels, retention ponds, and green roofs. This practice helps manage runoff and promotes water efficiency by reusing collected water for various purposes.

Rain water harvesting
(Green Building Archives - Penguin, n.d.)

4. Vegetation

Retain the bougainvillea because of its beauty and add more along the edge of the site.
Due to the nature of its roots it is not to be planted close to buildings.

Bougainvillea on site
(B.A.S. Year IV contributing authors, 2024)

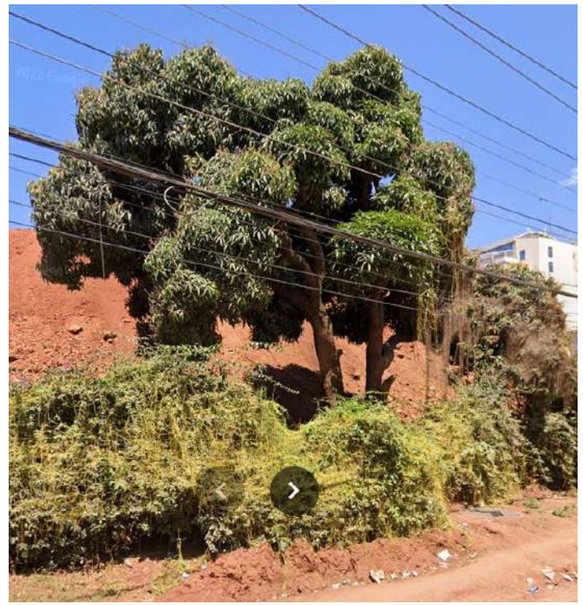
Retain the Meru Oak as it is a rare species and holds value to the local residents it will be retained.

Meru Oak tree on site
(B.A.S. Year IV contributing authors, 2024)

Clear the ground cover on site since they have grown on earth mounds that are to be excavated.
Retain Trees along the edge of the site to act as barriers to sound and

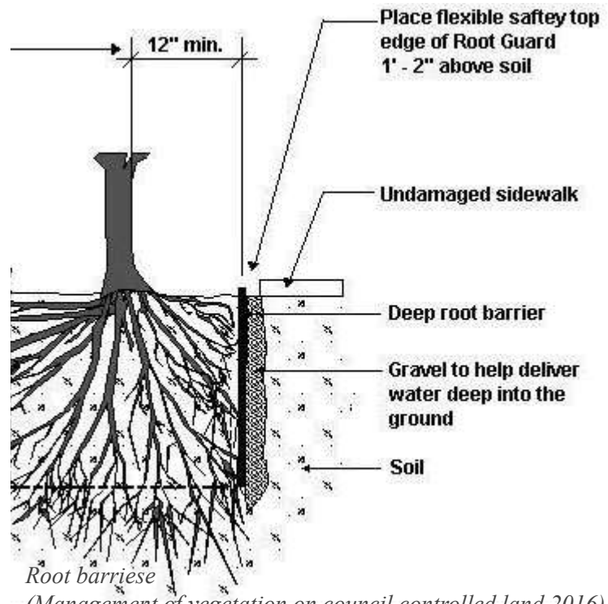
Ground cover on site
(B.A.S. Year IV contributing authors, 2024)

Retain Trees along the edge of the site to act as barriers to sound and more to be added .



Vegetation on site boundary
(Google street view, 62 Westlands Rd Nairobi, 2023)

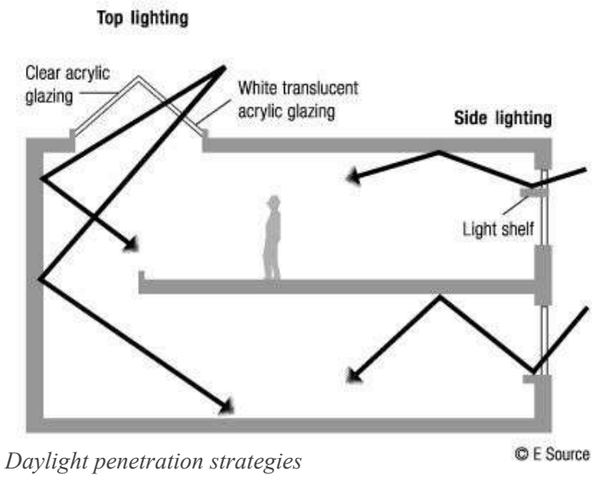
Root barriers are crucial for preventing invasive root growth from damaging structures and underground utilities. They help ensure that plants and trees grow in a controlled manner without disrupting surrounding areas. By using root barriers, you can protect your property and maintain a healthy landscape.



Root barriese
(Management of vegetation on council controlled land,2016)

5. Day Lighting

Daylighting refers to the practice of maximizing natural light in buildings through design strategies such as large windows, skylights, and light wells. This approach reduces the need for artificial lighting during the day, enhancing energy efficiency and creating a more comfortable and productive indoor environment.



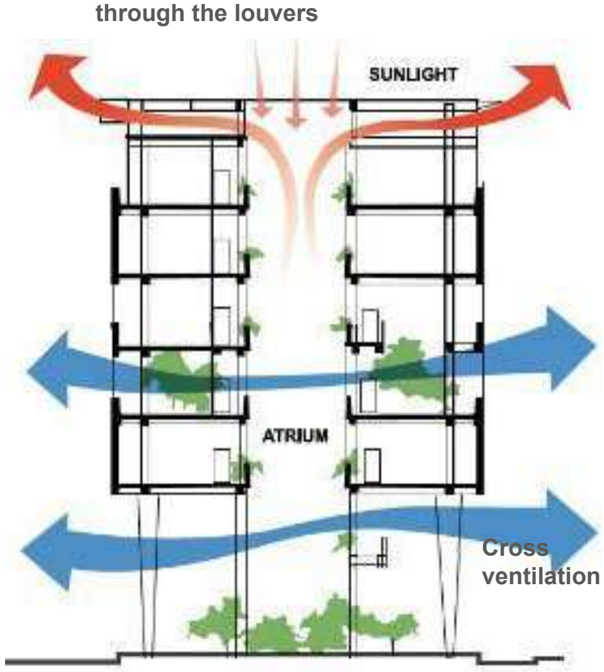
Daylight penetration strategies
(Business Energy Advisor | Daylighting Systems, n.d.)

6. Daylight control

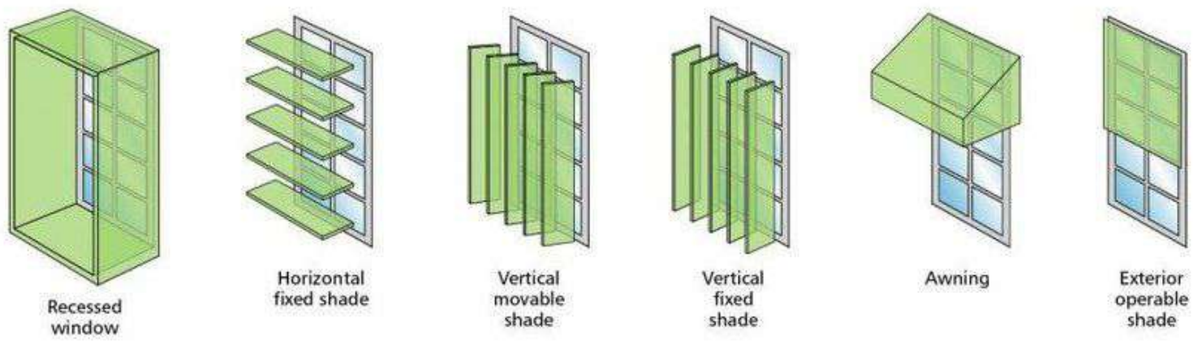
Daylight control involves strategies and technologies used to manage and optimize natural light within buildings. This includes the use of shading devices, light shelves, blinds, and sensors to regulate the amount of daylight entering indoor spaces. These methods help improve visual comfort, reduce glare, and enhance energy efficiency by minimizing the reliance on artificial lighting.

7. Passive cooling

Passive cooling cools buildings naturally without mechanical systems, using strategies like natural ventilation, shading, thermal mass, insulation, reflective materials, optimal orientation, night cooling, and evaporative cooling. Benefits include energy efficiency, cost savings, and reduced environmental impact, though effectiveness requires careful design and maintenance.



Passive cooling by stack and cross ventilation
(Wendymacleod, 2022)

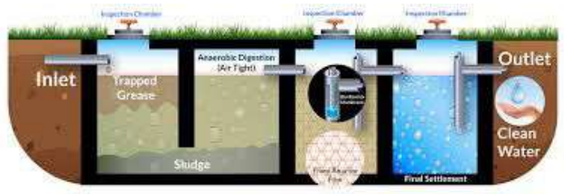


Examples of daylight control strategies
(New CIBSE Guide for Building in Tropical Environments - Mitsidi, 2017)

8. Waste management

Implementing a biodigester for on-site sewage treatment in commercial settings reduces waste, lowers emissions, and conserves water by converting organic waste into biogas and fertilizer. It supports sustainability and cuts costs, involving design, compliance, installation, and maintenance.

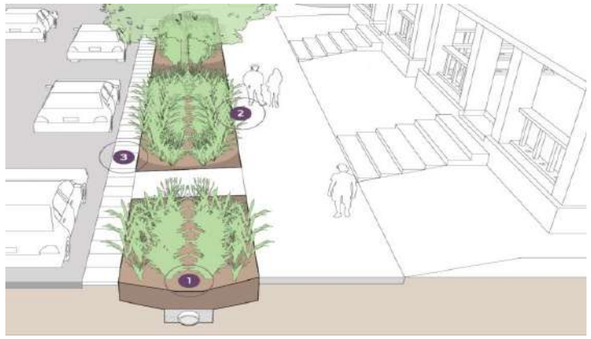
Greywater reuse recycles household wastewater for irrigation and toilet flushing, conserving freshwater and promoting sustainable water management.



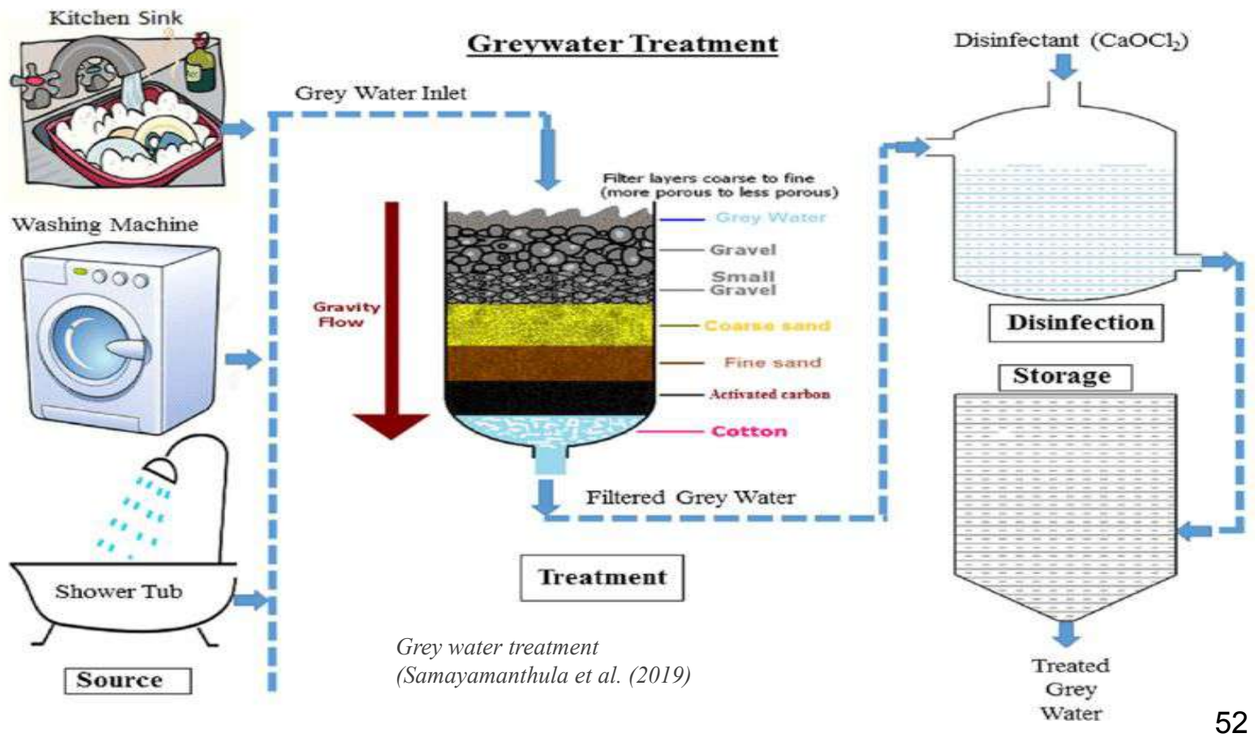
On-site sewage treatment
(BlueFlame Energy Solutions, 2023)

9. Green infrastructure

Bioretention swales, green roofs, and green facades enhance urban sustainability by managing stormwater, reducing runoff, and improving water quality. Green roofs retain rainwater, insulate buildings, mitigate urban heat, and improve air quality, while green facades use climbing plants for insulation, noise reduction, biodiversity support, and urban aesthetics, creating more livable and attractive spaces.



Bioswales
(Biofiltration Planter | National Association of City Transportation Officials, 2017)



Grey water treatment
(Samayamanthula et al. (2019)

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3. Business Energy Advisor | Daylighting Systems. (n.d.). https://esource.bizenergyadvisor.com/article/daylighting-systems
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5. *3D Sun-Path. (n.d.). https://andrewmarsh.com/software/sunpath3d-web/*

PARKLANDS

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

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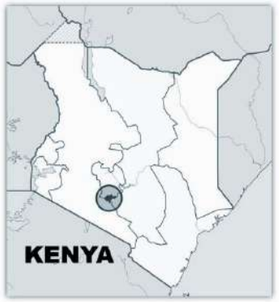
SITE LOCATION



Nairobi County Map Source:Google

ABOUT THE ACCESS ROADS

1.WAIYAKI WAY`

Access road, Source: Google street view, 2023

- 7 & 12 M Wide Road
- Two Lane
- Varying widths of the Road at different points
- It is a high traffic road allowing for both PSV and private vehicles

GENERAL ACCESS TO THE SITE

Satellite image showing site and context (*Google Maps*, n.d.)

2.PARKLANDS RING ROAD

Access road, Source: Google street view, 2023

- 18 M Wide Road (Vehicular)
- Two Lane
- 1.5 M Pedestrian Walkway on each side.
- Street lights present
- Experiences heavy traffic at peak hours that is early mornings and late evenings

3.LOWER KABETE RD

Access road, Source: Google street view, 2023

- 14 M Wide Road (Vehicular)
- Two Lane
- 1.5 M Pedestrian Walkway on each side.
- Street Lights present
- Experiences heavy traffic at peak hours that is early mornings and late evenings

- Waiyaki Way
- Parklands Ring Road
- Lower Kabete Road
- Peponi Road
- Peponi Road
- General Mathenge Road

4.PEPONI ROAD

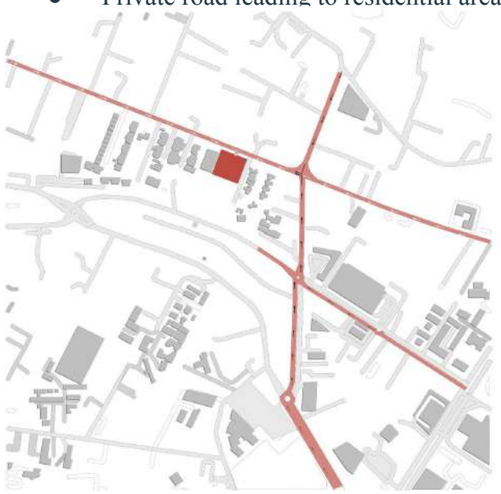
Access road: Source:Google street view 2023

- 8 M Road
- Two Lane
- With extra 1.5 M Pedestrian Walkway on each side.
- PSVs have access and there are two bus stops along the road.
- Traffic jam is mostly experienced at early mornings up to 9 am and evenings from around 4 pm to 7pm

5.GENERAL MATHENGE RD

Access Road: Source:Google street view, 2023

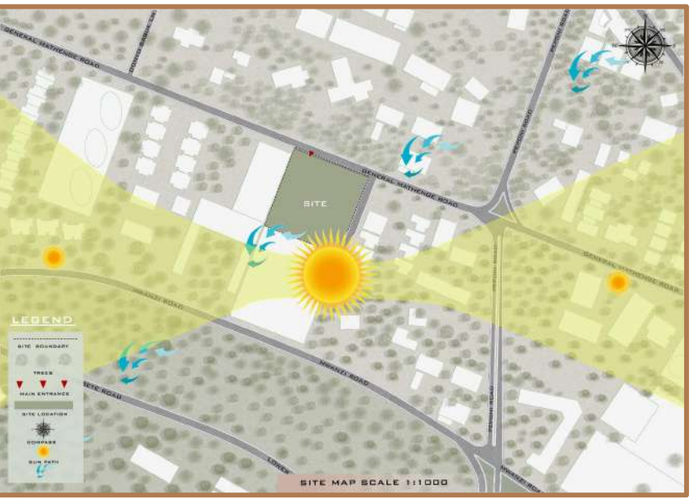
- 6 M Road
- Two Lane
- With extra 1.5 M Pedestrian Walkway on each side.
- Private road leading to residential area.



Site location, Source: Open street map

CLIMATE ANALYSIS

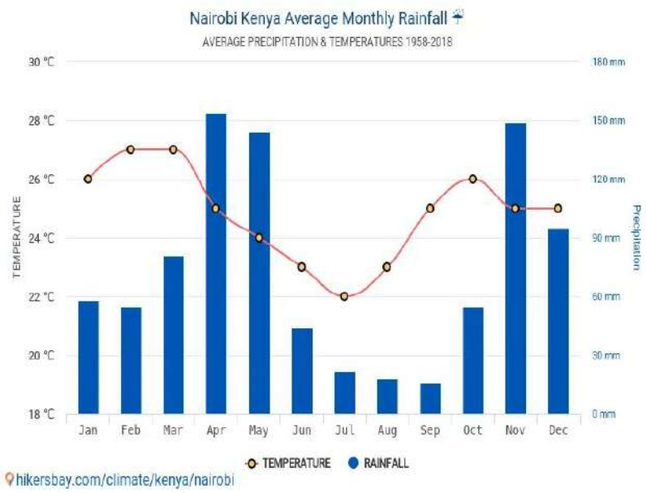
1) SUN PATH



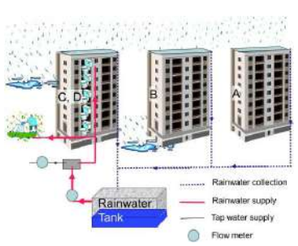
Sun path on the proposed site.

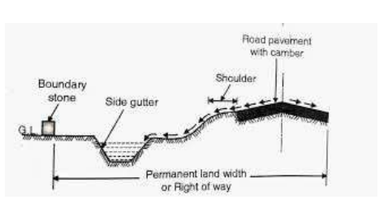
SOLUTION - Installation of exterior shading devices to reduce sun ray penetration on the west and east facing facades.

2)RAINFALL



The long rains typically occur from March to May, while the short rains fall between October and December.





3.WIND DIRECTION AND ORIENTATION

Wind direction on site
Source:Google Earth 2023

The wind direction in Parklands is mostly from west to east.

*The wind flow across the site is also affected by the surrounding buildings

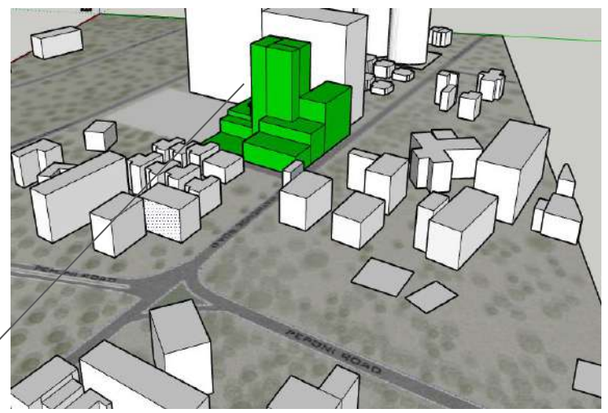
RECOMMENDATIONS

- Implement effective drainage systems to prevent water accumulation on the construction sites.

This includes proper grading, installation of drainage pipes, and designing structures to direct water away from vulnerable areas.

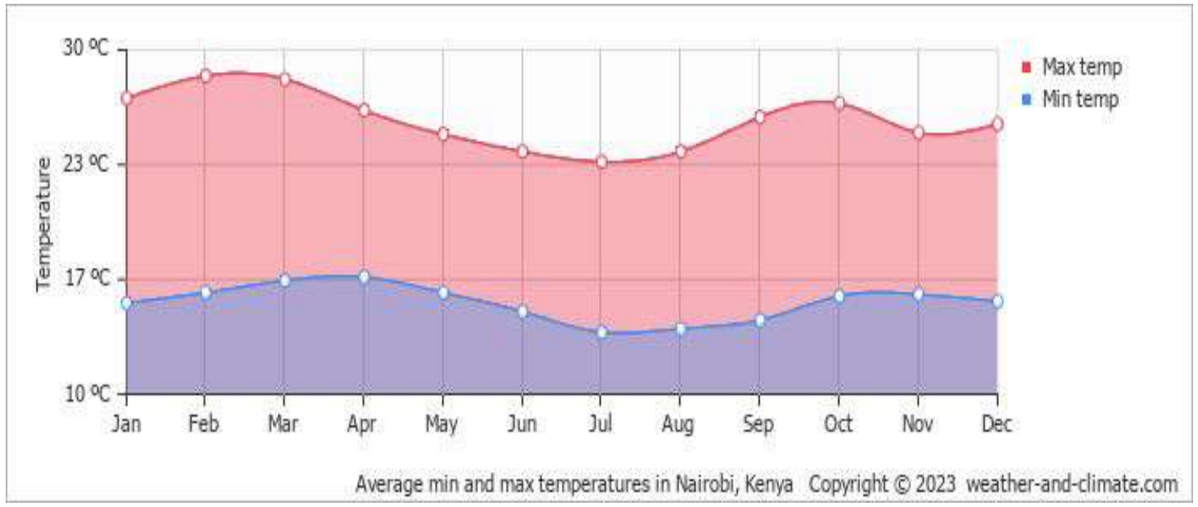
- Elevated foundations: Consider elevating structures or using raised platforms to minimize the risk of flooding during heavy rainfall
- Designing of stepped building structure to allow for even distribution of the wind loads and enhancing the overall stability of the building

Stepped structure which makes it possible to have easy natural ventilation with minimal discomfort resulting from extreme pressure variation.,



An illustration of the use of a stepped structure on site to maximise on natural ventilation

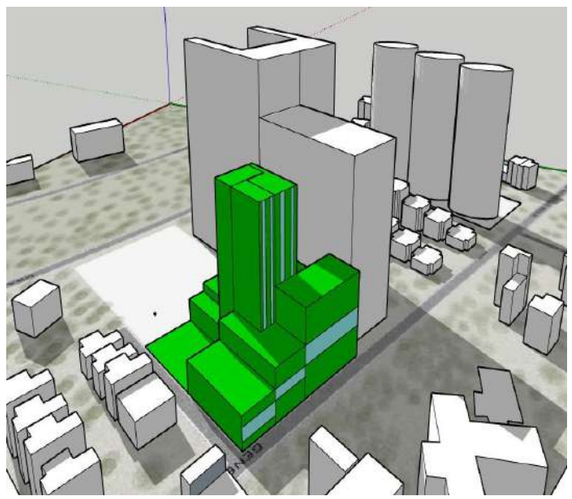
4.TEMPERATURES



Nairobi's temperatures range from 10°C to 26°C, offering a mild and moderate climate. Cool nights and warm days prevail, with minimal temperature extremes throughout the year.

RECOMMENDATIONS

- Locate the windows and other light openings on the North-South facades to minimise sun shading requirements
- Recession of openings on East and West facing facades minimizing heat gain within the spaces.
- Use of double glazing windows
- to allow for natural lighting and views whilst minimizing heat gain from the exterior environment



NEIGHBORHOOD ANALYSIS

POPULATION AND DEMOGRAPHY

Most residents in the area range from skilled, non skilled and entrepreneurs

The buildings within the neighborhood fall majorly in the following categories:

- Commercial
- Residential
- Office
- Recreational facilities

1. COMMERCIAL BUILDINGS

★ Westgate mall

The Westgate Mall. Source: Google maps 2023

10 min walk proximity to site.

The project is a shopping mall oftenly regarded as East Africa's premier shopping centre.

.Contains restaurants, food courts, retail stores, recreational activities and plenty of parking space.

★ Sarit centre

15 MIN walk to the site.

Aerial view of Sarit centre Source:Google photos

Located off Lower Kabete Road.

Everything is available under one roof.

This includes places of entertainment,

- Dining establishments,
- Workplaces,
- And healthcare facilities,
- To name a few.
- The food court and brewery.

2.OFFICE BUILDINGS

★ West side tower

Westside Tower is located at the junction of

Brookside Drive and Lower Kabete road.

Side view of the West Side tower
Source: Taken during site visit

Features included;

- 4 high speed lifts
- Generator backup
- Fire Equipment
- 24 hour security
- VIP toilets and general gents and ladies
- toilets on each floor
- Kitchenette on each floor
- Commercial space provided as "shell and core"
- 1 FREE parking per every 1,000 sq ft rented
- Minimum space available 3,200 sq ft
- Maximum space available 4,000 sq ft
- Whole floor space is 11,200 sq ft.

★ The Piano

View of the the Piano building
Source:Google photos

- The Piano is a beautifully crafted Grade A commercial building with grand high ceiling entrance, **16 floors of dynamic office space**, a **rooftop** and **Helipad**.
- Total gross lettable area of approximately 136,137 sq.ft

Amenities include:

- Standby generators, borehole,
- 5 high speed passenger elevators plus 2 service/vip elevators,
- 24 hours security & CCTV surveillance, electric Fence, fire alarm & detection System.

CONCEPT, FORM AND MATERIAL USE

- The idea behind the form design of the building was an actual piano itself. The building is designed to resemble a piano with the podium looking like the keys of a piano and the roof resembling the lid of a piano.

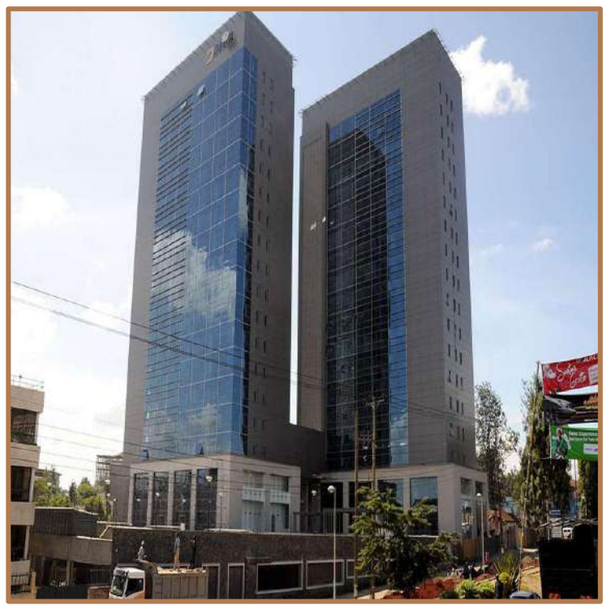
In terms of materials use:

- There's extensive use of glass on the building's facade.
- Steel and concrete are also highly evident in the buildings fabric.

An image of a piano

View of the entrance facade of the piano building
Source:Google map photos

★ Delta Corner Annex



View of the Delta Corner Annex
Source:Photo taken on site

This building stands tall on Chiromo Road and offers 21 floors of modern office space.

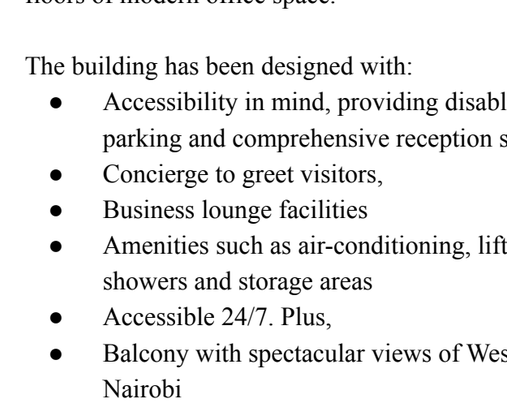
The building has been designed with:

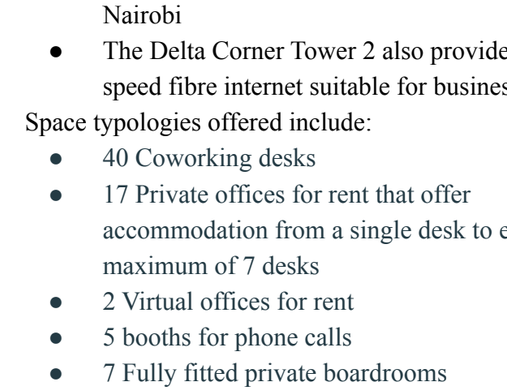
- Accessibility in mind, providing disabled access, parking and comprehensive reception services.
- Concierge to greet visitors,
- Business lounge facilities
- Amenities such as air-conditioning, lifts/elevators, showers and storage areas
- Accessible 24/7. Plus,
- Balcony with spectacular views of Westlands Nairobi
- The Delta Corner Tower 2 also provides high speed fibre internet suitable for businesses

Space typologies offered include:

- 40 Coworking desks
- 17 Private offices for rent that offer accommodation from a single desk to even a maximum of 7 desks
- 2 Virtual offices for rent
- 5 booths for phone calls
- 7 Fully fitted private boardrooms
- Unique and spacious common spaces

INTERIOR SPACES AT DELTA CORNER ANNEX





Source: Google photos

★ **Rivaan centre**

Aerial view of the entrance area of Rivaan centre
Source:Google photos

The office complex offers high quality

- Office accommodation, designed to International standards And flexible working environment.
- Standby generators,
- Borehole
- Passenger lifts,
- Security check & CCTV surveillance,
- Electric fence, fire alarm & detection
- The building comprises of 58,000 sq.ft built up area

across 5 floors of outstanding office and retail space.
The building offers the following

Multiple Office Spaces to suit one's needs, from partitioned to open plan layout and all on different floors.

3,RESIDENTIAL BUILDINGS

Residential Buildings:

- Apartments: Multi-story buildings with multiple residential units.
- Townhouses: Row houses or clustered housing units
- Mixed-Use Developments: Developments that integrate various functions, such as residential, commercial, and recreational spaces within a single complex

An image showing a residential home within the neighbourhood

Images showing apartments in the area

Mixed use development in the area
Source:Photos taken on site

4.RECREATIONAL FACILITIES

★ **Parklands Sports Club**

An image of the swimming pool in Parklands Sports club
Courtesy: Google photos

Gym facilities

Swimming and gaming facilities

ARCHITECTURAL STYLES EVIDENT IN THE NEIGHBORHOOD

Main Architectural styles in the neighbourhood include:

- Colonial Architecture
- Modern Architecture
- Contemporary Architecture

★ Colonial Architecture

Mostly used on the older bungalow residentials in the neighbourhood

Characterised by

- Use of materials such as block/brick.
- There is use ofless use of glass and Concrete.
- Use of gable roofs made of clay tiles
- Most of these buildings go upto two storeys high
- Plane facades, hidden structural elements.

The Palms residence

Cottage development,opposite site

★ Modern Architecture

Most recent buildings within the neighbourhood are of a modern style of architecture.

Characterised by:

- Use of materials such as glass, steel and concrete.
- These buildings lean towards minimalism and less ornamentation.
- Use of simple clean lines
- Priority given to form more than function.

Boutique Hotel. Courtesy:Google Earth photos.

Westside Heights. Courtesy: Photo taken on site

★ Contemporary Architecture

Used on most of the office and Commercial buildings around site.

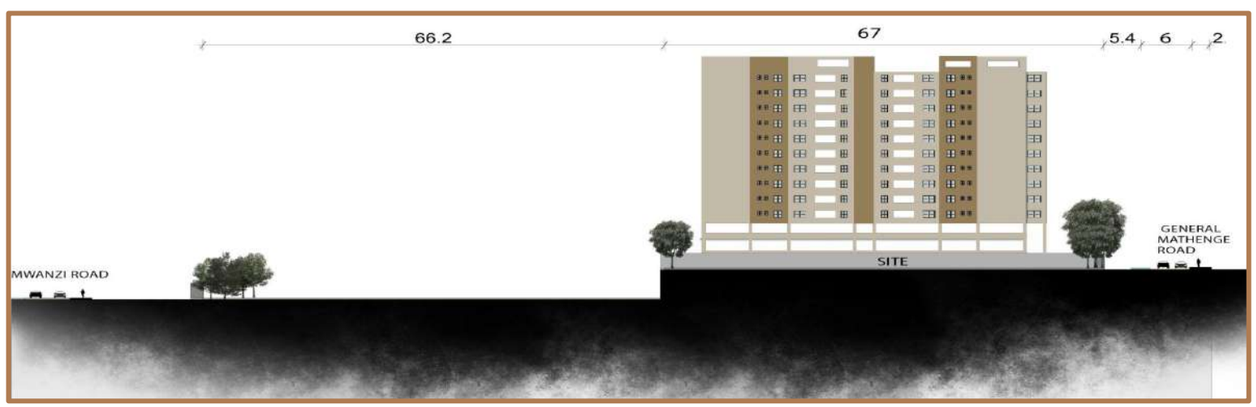
Characterised by

- Materials such as glass, concrete and steel.
- Use of innovative materials
- Use of curved lines, rounded forms,large Windows & free form shapes

Crystal Edge Apartments.Courtesy; Photo taken on site

TOPOGRAPHY ANALYSIS

Site Master plan



The site is generally flat.

Site section showing slope existing on site

SENSORY ASPECTS

The neighbouring Westlands botanical gardens offer scenic views for the users of the proposed project.

- As for the noise,the site being in an urban setting noise levels are highly significant and they originate from:
  .Surrounding buildings
  .Vehicular roads close to the site
  .From users of the building itself and those surrounding the proposed project.

RECOMMENDATIONS

- Use of noise barriers such as trees to minimize noise flow from the exterior to interior.
- Use of acoustical materials minimizing sound transfer from adjacent spaces.

VEGETATION ANALYSIS

The site is fully paved so vegetation is limited.

The trees in the site are located at the edges thereby serving as live fence

An image taken on site showing vegetation existing on site

EXISTING VEGETATION

- Bougainvillea
- Asparagaceae
- Kei- apple
- Fern tree

RECOMMENDATIONS

Water Features: Consider incorporating water features like fountains, ponds, or waterfalls, if space and budget allow.

Maintenance Considerations: Choose plants and materials that are low-maintenance and require minimal watering, pruning, and care.

Greenery and Plant Selection: Incorporate a mix of trees, shrubs, flowering plants, and ornamental grasses to create interest and diversity.

Blowups of site highlighting existing vegetation

Aerial view of the site. Courtesy:Google Earth photos

Blowups of site highlighting existing vegetation

SOIL

The Site is covered by a concrete slab

Soil in the area around the site is red Soil

Existing soil mound dumped on site from neighbouring sites

- Implement effective moisture control measures to minimize the impact of moisture fluctuations on red soils. This may include proper grading, installing drainage systems, and ensuring proper site drainage away from structures.

DRAINAGE

There is a storm water drainage located on the northern Border of the site

The drainage channel is 0.5M Wide.
It is clogged with tree branches,leaves and soil.

Drainage channel present on site .Courtesy Photo taken on site

RECOMMENDATIONS

- Establish vegetative cover to help stabilize the soil.
- Consider using permeable surfaces for driveways, walkways, and other paved areas.
- Use the relevant tools to scoop out the accumulated material to clear the drainage channel along the northern border.
- To prevent future clogs, install debris screens or grates at strategic points along the drainage channel. These screens can catch leaves and large debris, allowing water to flow freely.

UTILITIES

1. **Waste management**

- Sewer services

The site is located near a sewer line that serves the neighbouring buildings. It will ease our sewer connectivity of the proposed building.

View of site from General Mathenge road Courtesy: Photo taken on site

- Grey water

The edge of the site boundary is seen to have trench that is used to facilitate the control of stormwater around the area (site).

Existing trench on site

2.Security

- Boundary wall

The site is seen to be surrounded by thorn fence (kayapple). Inside, there is a temporary iron sheet structure that indicates presence of on going construction.

- Security lighting

Presence of street lights that improves the security around the area i.e at night

An image showing existing street lighting along the site street.
Courtesy: Photo taken on site

3.Fibre and internet connection

Presence of internet services in the neighbourhood as service poles are seen to be passing along the site boundary i.e Safaricom fibre.

4.Power supply

The power/electricity in the area is provided by the Kenya Power by the Grid system.

5.Water supply

Water is supplied by the Nairobi city water and sewage company, under western region , zone one.

6.Gas supply

This is supplied by local distributors inthe area. Installation of customised LPG (liquified petroleum Gas) may deem appropriate to cater to the needs of the site.

BY-LAWS AND BUILDING CODES

Ordinances: Parklands is classified as zoned as zone 3, a commercial and residential zone. Only these land uses are allowed in the area.

Therefore, natively the commercial and office spaces projects would fit the site.

To develop a sports centre on site, one would have to develop a brief incorporating some commercial spaces to justify the development and blur out it being a purely recreation use of the site.

Building line:

- For residential buildings, the building line is **9 metres** from the centre line of the road or **6 metres** from the property boundary, whichever is greater.
- For commercial buildings, the building line is **15 metres** from the centre line of the road or **9 metres** from the property boundary, whichever is greater.
- For mixed-use buildings, the building line is **12 metres** from the centre line of the road or **7.5 metres** from the property boundary, whichever is greater.

Calculations have been done and building lines for our site have been shown and stated.

- Commercial use 12m
- Mixed use development 9m

Having courtyards, green spaces or pitch on the space overan by the building will allow use of these space then having structures deeper in site in accordance with the building line.

Site being bordered by only one tarmac road can be an advantage due to this.

Building Height restrictions:

- For commercial buildings, the maximum building height is **45 metres** or **15 storeys**, whichever is less.
- For mixed-use buildings, the maximum building height is **36 metres** or **12 storeys**, whichever is less.

So if story heights less than 3m eg; of 2.7 m is used, more stories may be added.

Ground Coverage:

- For commercial buildings, the ground coverage is **60%**.
- For mixed-use buildings, the ground coverage is **55%**.

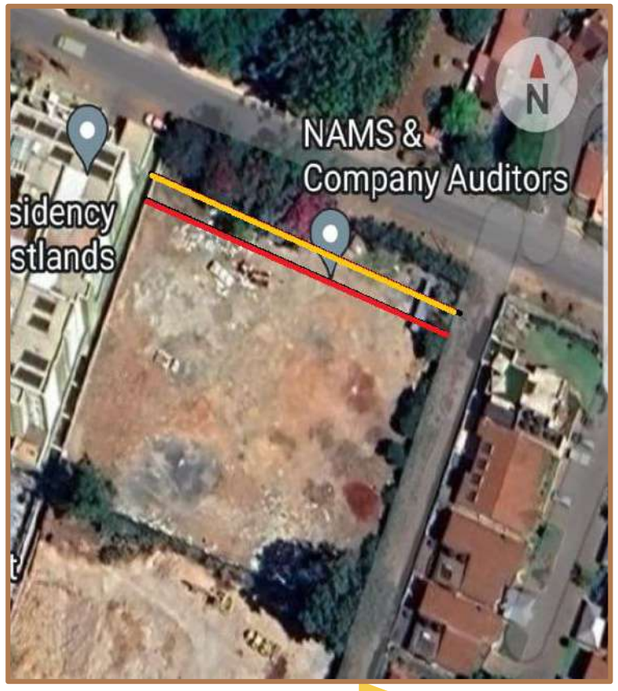
Plot Ratio:

- For commercial buildings, the plot ratio is **6:1**.
- For mixed-use buildings, the plot ratio is **5:1**.

A map showing Building Lines

Mixed use building line

Commercial use building line



An aerial view of site showing building lines for commercial and mixed use of the site.

TIGONI

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

Akinyi Odhiambo
Angaya Derrick
Blessing Ndehi
Gathu Juma
Joan Nzesya
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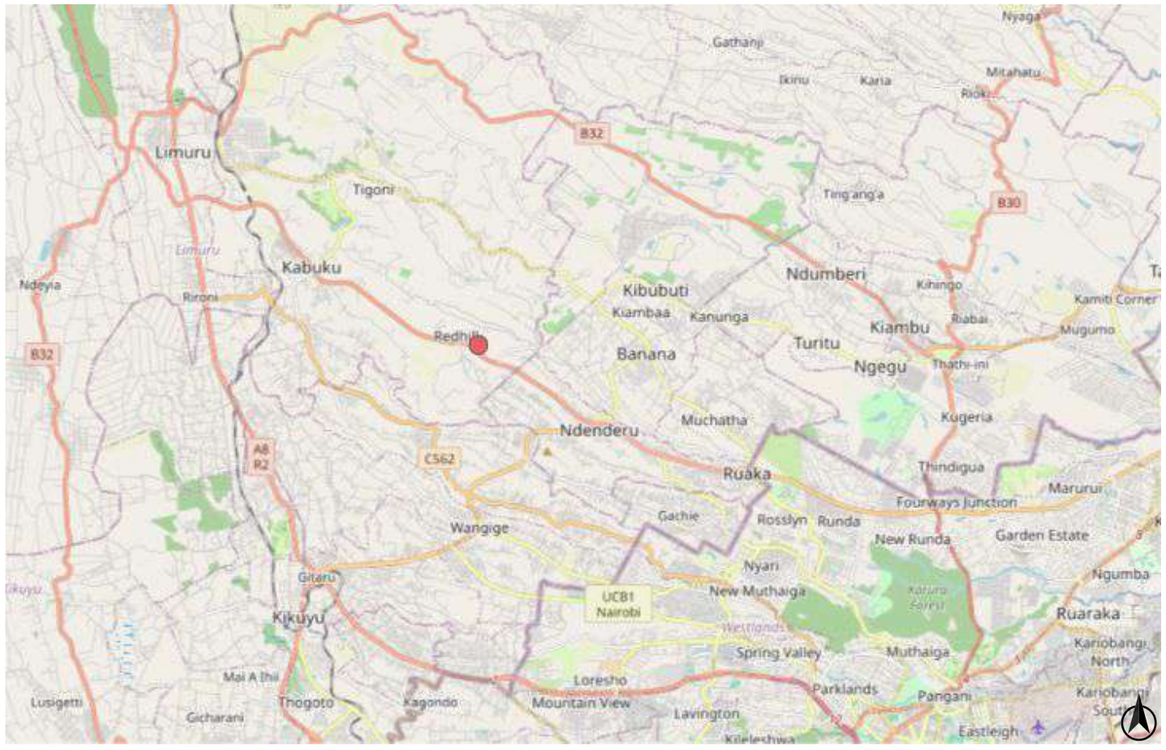
Matara Mshindi
Muua Mumo
Nelson Mburu
Nyabuta Kennedy
Phyllis Wang'ombe
Ramadhan Haji

TIGONI, SITE ANALYSIS

INTRODUCTION AND LOCATION

The site is located along Limuru Road.
It can be accessed from Nairobi via Ruaka and Ndenderu (37 min drive) or from Limuru via Kabuku (18 min drive).
The site has a generally regular shape which resembles a parallelogram.

The general dimensions for the site are approximately 100m for the width and 200m for the length.This makes the approximate area of the site as ; 20,000 sqm.When converted this is around 4.94 acres.
Tigoni is historically known for having a lot of tea plantations.



Map highlighting Redhill neighbourhood
Source: https://www.openstreetmap.org, 2024

Existing site plan with boundaries
Source: Authors, 2024

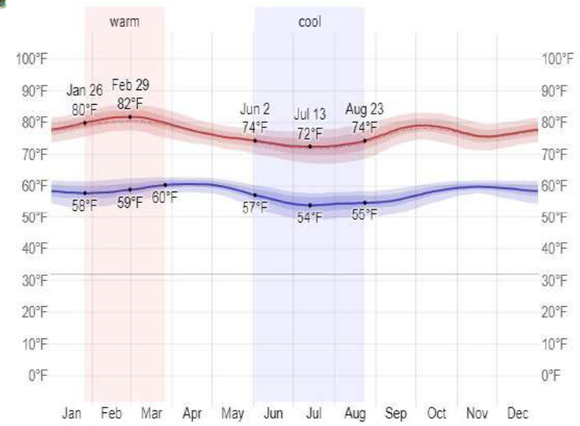
As such the area is generally green and very serene as it has a sparse population.
The area generally has stand alone residential houses and greenhouses for farming purposes.

NATURAL FEATURES

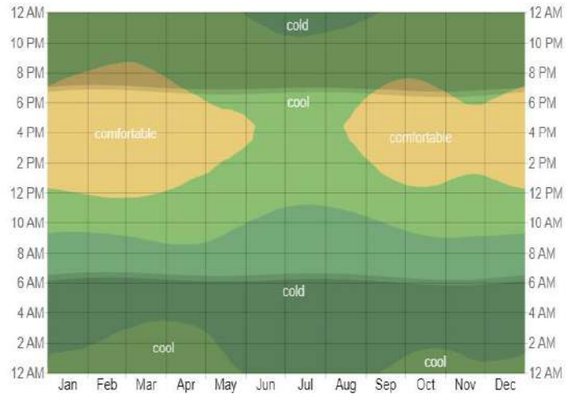
I. CLIMATE

A. TEMPERATURE

The **warm season** lasts for 2.1 months, from ***January to March*** , with an average daily high temperature above 71°F.
The **hottest month** of the year in Limuru is ***March,*** with an average high of 72°F and low of 52°F.
The cool season lasts for 2.8 months, from May 29 to August 21, with an average daily high temperature below 66°F.
The **coldest month** of the year in Limuru is ***July***, with an average low of 47°F and high of 64°F.



Graph of monthly average temperature in Limuru
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024



Graph of felt comfort levels during the day
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round , 2024

Over the course of the year, the temperature typically varies from 47°F to 73°F and is rarely below 44°F or above 77°F.
Due to **precipitation and humidity**, most of the temperature *recorded and felt* is different .
According to the table below, the difference could stagger upto *4 degrees* lower than recorded temperature. This results at times due to vaporization of the humidity to mist and condensation of the same into fog.
This will also affect cloud cover and sunshine hours which will be discussed later.

Table of comparison between recorded temperature and felt temperature
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024

July is the peak of the cold season in Kenya, and Limuru in Kiambu County is considered among the coldest regions.
According to the weather forecasts, temperatures in Limuru drop to as low as 10 degrees Celsius during the cold season - a season characterised by fog and mist across the landscape, leading to poor visibility.

Picture of Limuru Road during the cold season
Source:https://www.talkafrica.co.ke/weather-man-warns-temperatures-could-dip-as-low-as-5c-in-kenya/, 2021

Street furniture such street lighting will help increase visibility around the project and prevent accidents at such times.

B. RAINFALL

The rainy period of the year lasts for 8.8 months, from September to June.
with a sliding 31-day rainfall of at least 0.5 inches.
The month with the most rain in Tigoni is April, with an average rainfall of 4.3 inches.
The rainless period of the year lasts for 3.2 months, from June to September .
The month with the least rain in Limuru is July, with an average rainfall of 0.2 inches.
Though the rain is constant its very little rain as observed in the graphs.

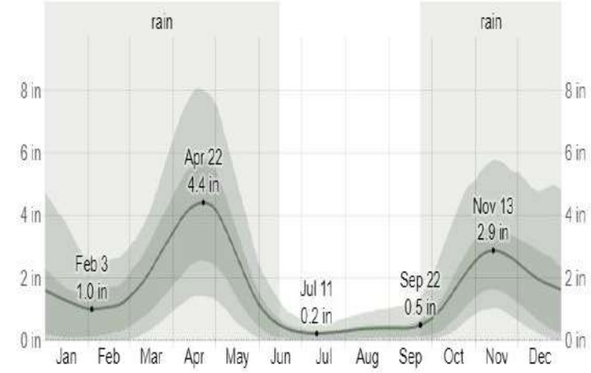


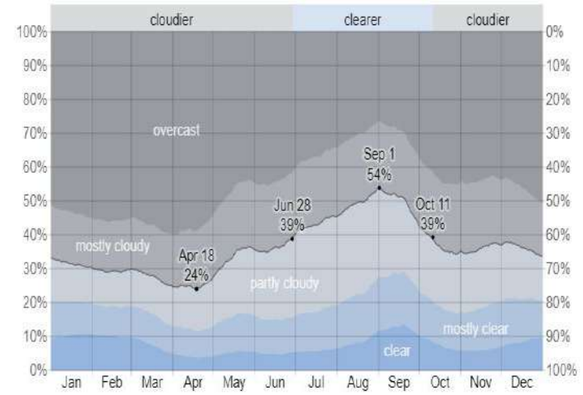
Table of average monthly rainfall
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024

C. CLOUD COVER

In tigoni, the average percentage of the sky covered by clouds experiences significant seasonal variation over the course of the year.

The **clearer** part of the year in Limuru lasts for 3.5 months; The clearest month of the year in Limuru is September, during which on average the sky is clear, mostly clear, or partly cloudy 50% of the time.

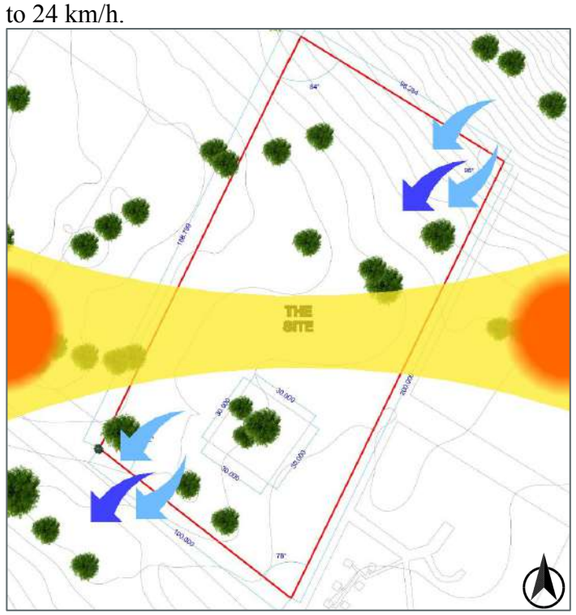
The cloudier part of the year lasts for 8.6 months; The cloudiest month of the year in Limuru is April, during which on average the sky is overcast or mostly cloudy 75% of the time.



Graph of average monthly cloud cover
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024

D. SUN PATH AND WIND DIRECTION

The wind direction is from Northeast to Southwest. This occurs as a gentle breeze averaging 11-16 km/h. The area also experiences occasional wind gusts of up to 24 km/h.



Site base plan showing wind direction and sun path
Source: Authors, 2024

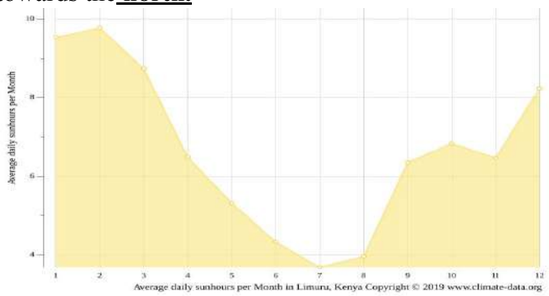
E. SUN AZIMUTH

The length of the day in Limuru does not vary substantially over the course of the year, staying within **6 hrs throughout**.

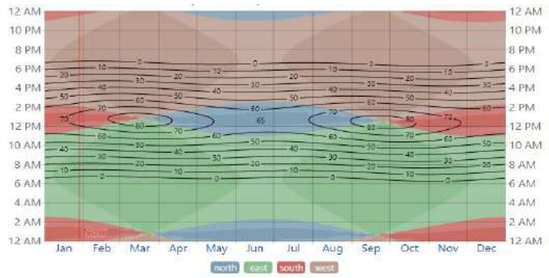
Maximum hours in sunlight is approximately ***9 hrs in february*** and minimum at ***4 hrs in July.***

The sun is seen to be mostly felt and observed in the eastern horizon.

The inclination of heat is varied on the season during the **warmer season** the sun azimuth inclines to the **south** and during the **cold season** the sun inclines towards the **north.**



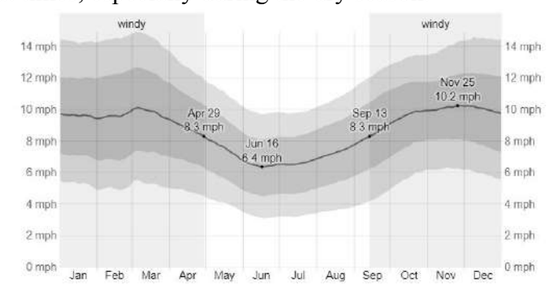
Graph of average monthly sunshine hours in Limuru
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024



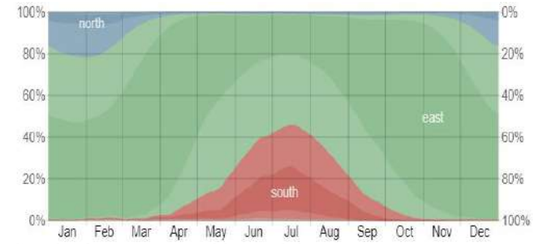
Graph of sun location in sky as felt in Limuru
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024

F. WIND

Limuru, Kenya, experiences variable wind patterns. Being located in a highland area, the wind can be influenced by local topography. Generally, Limuru has a mild and temperate climate with breezy conditions at times, especially during the dry season.



Graph of average monthly wind speed in Limuru
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024



Graph of average monthly wind direction in Limuru
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024

G. HUMIDITY

On average, May is the most humid month, at 78.0%.

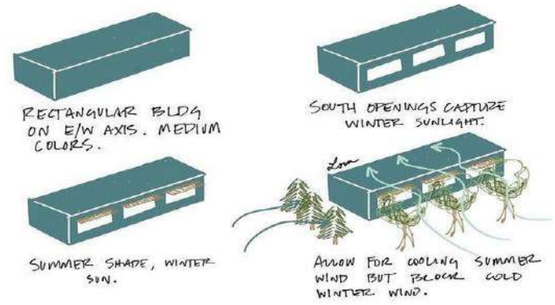
On average, February is the least humid month, at 62.0%.

The average annual percentage of humidity is 72%.

Graph of average relative humidity in Nairobi
Source:https://weatherspark.com/y/99550/Average-Weather-in-Nairobi-Kenya-Year-Round, 2024

RECOMMENDATIONS

Align along the north -south direction inclining on the Eastern horizon.



Illustrations of effect of orientation and placement of windows
Source: https://www.pinterest.com/pin/610097080788987694/

A building's envelope is one of the main factors to consider when building in a cold climate, as it is the envelope that can lead to most problems in buildings. Consider a tight building envelope.

Air sealing can help to prevent cold air from entering the building and warm air from escaping. Buildings with higher air leakage require more HVAC systems to keep the building comfortable.

Covered entrances and open spaces prevent excessive cold air from disrupting the comfort of the users while entering or exiting the building.

Recessed entryways help protect the entrance from prevailing winds.

Illustration showing the difference between tight and loose building envelopes
Source: https://www.bigrentz.com/blog/building-envelope, 2021

House ventilation is also necessary to remove moisture vapor from under exterior wall and roof cladding.

In colder climates, windows can be allies and foes at the same time: If too many windows are put, one loses heat, and if too few are put, one would not receive any heat from the sun.

The windows must be placed strategically, facing the sun (north, when building within the hemisphere, and South when building north of the equator). It is advisable to have a maximum window area on the Southern side of the building to facilitate heat gain. Glass with low thermal transmittances, like hermetically sealed double glass, must be preferred. Sealed and double-glazed windows will also help reduce heat loss.

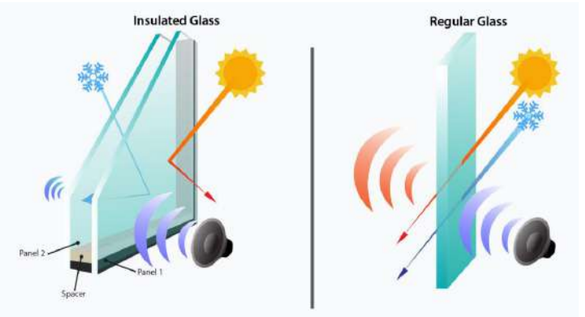


Illustration showing effect of using insulated double-glazed windows in comparison to regular single-glazed windows
Source:https://www.fabglassandmirror.com/blog/complete-guide-for-buying-insulated-glass/, 2019

Cross ventilation – Placing windows at multiple facades at the right places to assist the exchange of the existing air with new air.

Stack ventilation – since the prevailing wind tends to be at a higher pace in cold climatic areas, wind can be used in stack ventilation and also for energy production.

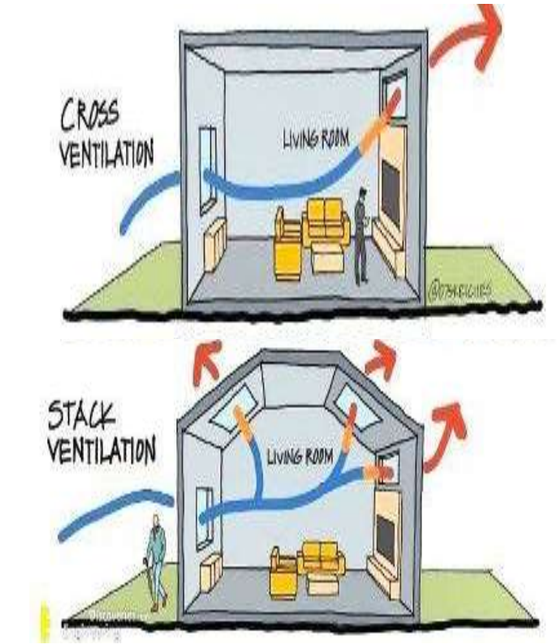


Illustration of cross ventilation and stack ventilation
Source: https://www.energy.gov/energysaver/natural-ventilation,

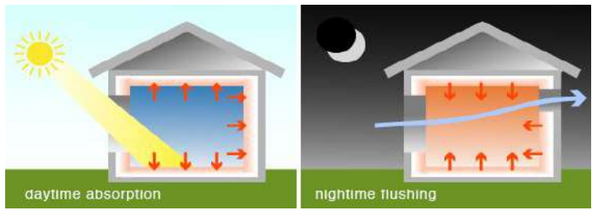


Illustration of heat gain and heat loss
Source:https://www.greenspec.co.uk/building-design/thermal-mass/,

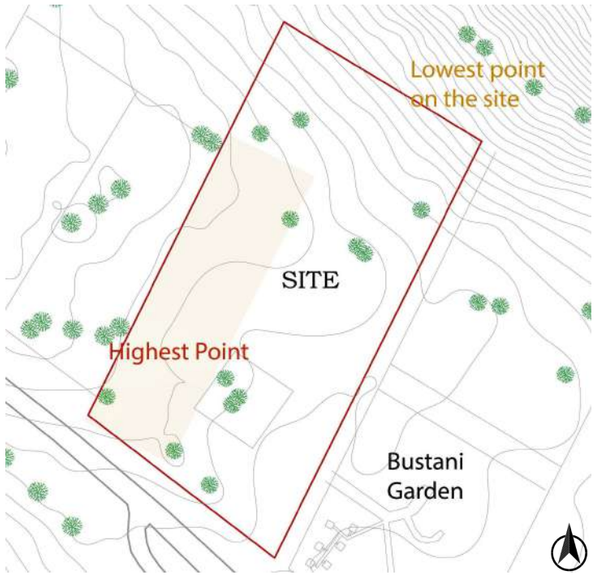
In cold climates with high heating needs, high thermal mass can support passive heating.
Other common materials used include **concrete, bricks, and tiles.**
These materials have **high thermal mass and can absorb and store heat during the day and radiate it out as the temperature drops in the afternoon throughout the evening.**

Landscaping and Vegetation
Use trees as natural wind barriers or buffers by planting them near windows to block cold air from entering the building.
Plants and trees chosen for landscaping must be able to survive the harsh climatic differences

Roofs
In spaces where there is a lot of rain or snow, the provision of steep and sloped roofs helps prevent water stagnation on the roofs.
Provide materials and designs that allow maximum solar penetration into the building such as glass.

Other design strategies
Shading to walls from roof eaves and shading devices should be optimally calculated to provide shade in summer and passive solar heat gain in winter.
Courtyards are an effective device for increasing surface area-mass ratio. They also draw natural daylight, passive heating through solar heat gain and passive cooling through natural ventilation deep into the floor plan.
Thermal resistance is more important than thermal mass. To achieve this, high performing building envelopes with lightweight cladding by utilising appropriate thermal insulation and sealing the building to prevent thermal bridging.

II. TOPOGRAPHY



Site plan showing existing topography
Source: Authors, 2024

Discussion
The highest point is southwest of the site and the lowest point is northeast of the site
The site profile is generally flat.

Section through site showing the general topography
Source: Authors, 2024

Recommendations
Drainage should be towards the lowest point i.e. north of the site.
Location of the septic and soak pit should also be at the lowest point of the site.
Parking should be located at the generally flat part of the site, or basement parking.

Discussion
The site has red volcanic soils that are easily eroded , susceptible to swelling and sliding.
Therefore it has low bearing capacity.

Recommendations
Excavation and removal from the site
Use of raft foundation for low rise buildings

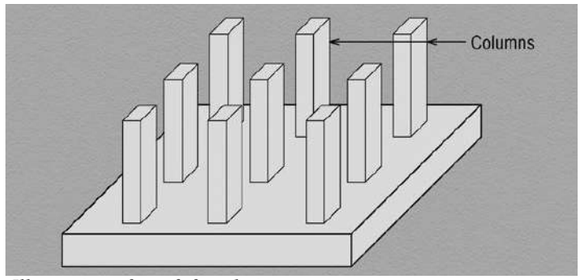


Illustration of a raft foundation
Source:https://gharpedia.com/blog/raft-foundation-types-advantages-disadvantages/, 2019

III. VEGETATION

The site is currently being used for agricultural purposes.
For most of the site there is grass cover, small shrubs and medium height trees.
The vegetation can be eliminated altogether with the exception of the boundary trees during the construction process.

KEY:
- Vitex keniensis
- Grevillea robusta
- Musa (banana)
- Loquat
- Napier grass
- Common perennial plants

Site plan of existing vegetation distribution
Source: Authors, 2024

Images of Vitex keniensis, Grevillea robusta and Loquat on site respectively
Source: Authors, 2024

These are located close to the boundary: they are unevenly spaced.
The Vitex keniensis are three in number across the site and are approximately 9m high.

Images of Sunflower and Musa(Banana) on site respectively
Source: Authors, 2024

Among the planted subsistence and cash crops on site include napier grass, sunflowers, banana trees, kales and spinach.
The site also has a goat shed and kitchen coop.

RECOMMENDATION
The grevillea and loquat may be maintained along the boundary while the other planted crops need to be cleared for construction.
Consider incorporating snake plant, ponytail palm,primrose, geranium and other plants resistant to cold temperatures in your planting plan.

Image of a lawn with Kikuyu grass
Source:https://safiorganics.co.ke/blog/kikuyu-grass-disease-and-maintenance-tips/, 2022

Kikuyu grass has a high tolerance for cold and this makes it suitable.

Image of Arabica grass

Arabica grass had a medium tolerance to cold and is most suited for lawns

ACCESS AND CIRCULATION

The site in Kiambu county, tigoni area.
Site can be accessed via the following towns:

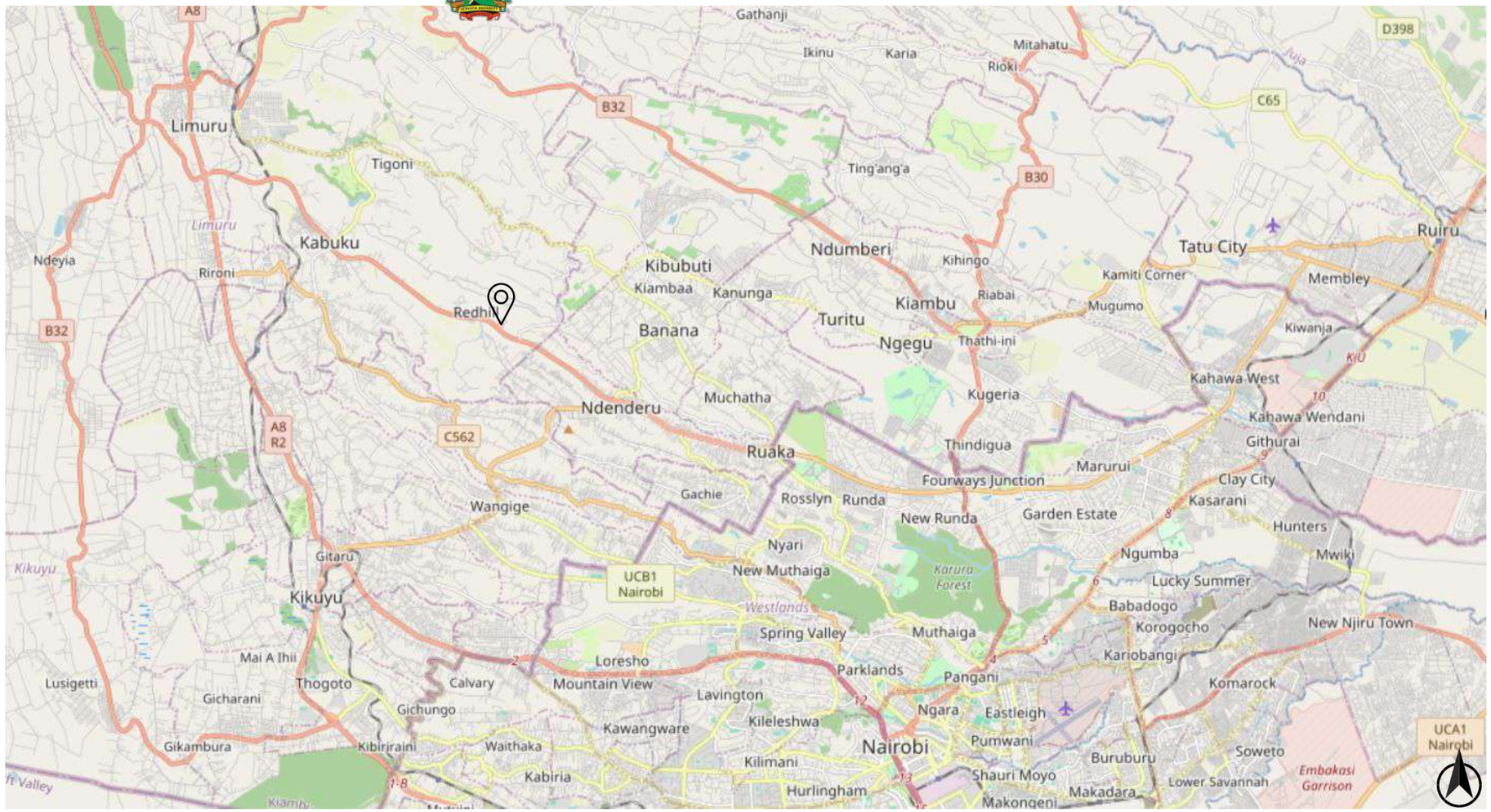
- Nairobi CBD
- Kikuyu town
- Kiambu town.
- Limuru town.
- Ruiru town.
- Banana town.

Access from Nairobi CBD

From Nairobi CBD:
↓ Through Uhuru Hwy which connects to Embu-Nairobi Hwy and then to Limuru Road
Muthaiga
↓ Through Limuru Rd
Ruaka
↓ Through Limuru Rd
Ndenderu Junction
↓ Through Limuru Rd
Site (Adjacent to Bustani Gardens)

Access from Kikuyu Town

From Kikuyu Town:
↓ Southern Bypass Rd
Gitaru town
↓ Gitaru Rd
Wangige town
↓ Gitaru Rd
Ndenderu Junction
↓ Limuru Rd
Site



Map of site in relation to surrounding towns
Source: https://www.openstreetmap.org, 2024

Access from Kiambu Town

From Kiambu Town:
↓ Southern Bypass
Kanunga Village
↓ Boma Road
Raini shopping centre
↓ Banana Raini Rd
Banana Market
↓ Banana Posta Rd
Ndenderu Junction
↓ Limuru Rd to
Site

To access the site from Ruiru one has to travel to Kiambu town and accessing through the earlier stated Kiambu route.
Banana route is given under Kiambu Route analysis.

Access from Limuru Town

From Limuru town:
↓ Kiambu Rd
Limuru bridge
↓ Eldoret- Malaba Highway
Muniu family Kamandura Junction
↓ Limuru Rd
Site

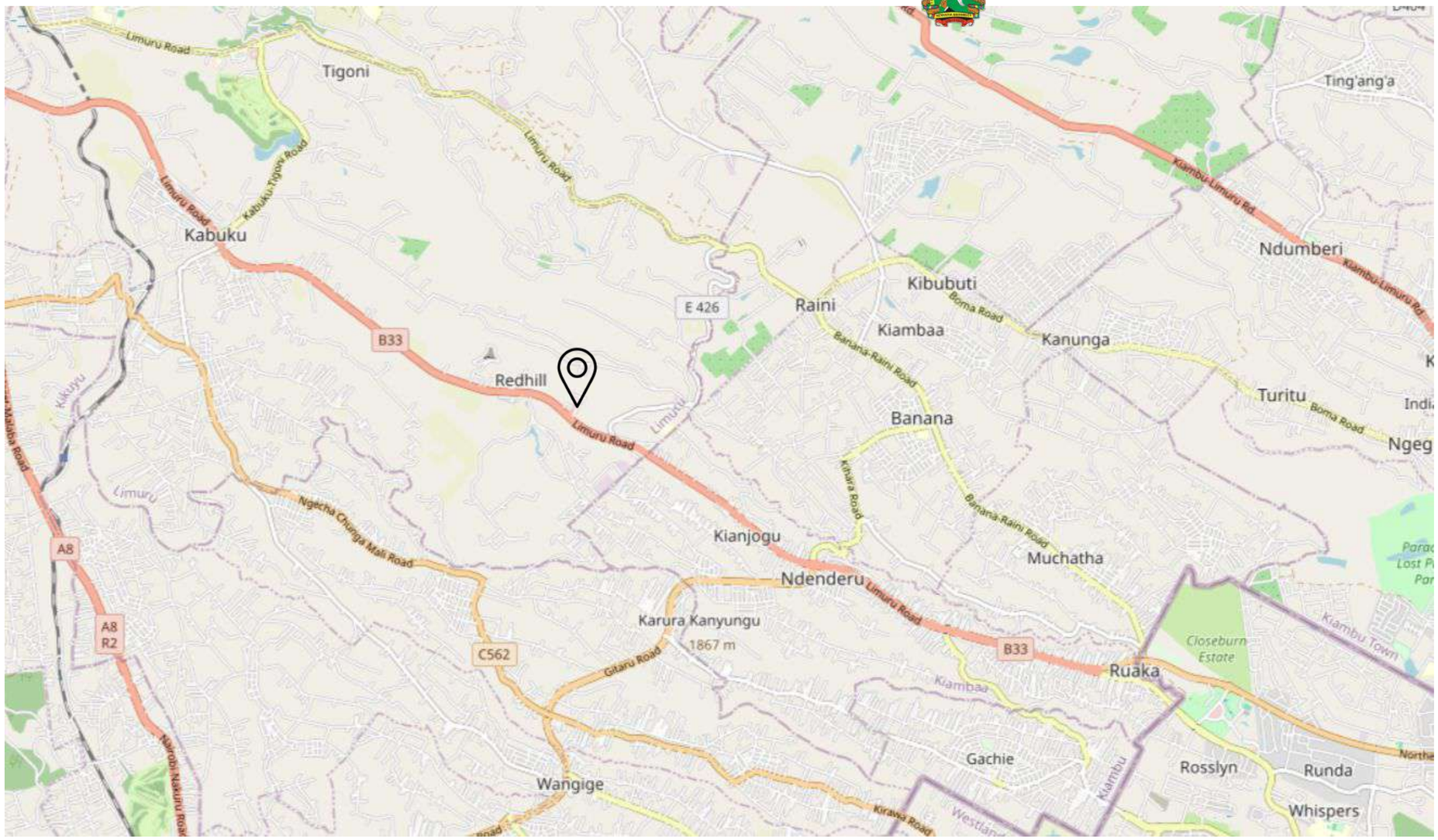
- St.Paul's University serves as a landmark for this route.

RECOMMENDATIONS

Provide entry and parking on the side of the road to allow easy access and exit from the site.
Introduction of a bus stop to allow easy public access.
Provision of pedestrian access to the site

NEIGHBOURHOOD

Site is within the Redhill Neighbourhood. The area is gently sloping, with rich and fertile agricultural land with cereal farms, tea plantations at 2500m a.s.l with 10-28 C temperature.
Predominantly sparse rural settlements, dendritic street pattern rooting from the main limuru road: the main transport option aside motorbikes around.
Agriculture, Community Event and Industrial land use are evident.
Zreniti House and Redhill Art Gallery are areas of Cultural and Historical Significance in the neighbourhood.
The neighbourhood boasts of a golf course :Upendo Golf Course, 200 metres South West of the site and covers an expansive space.
The Bamboo Resort and Muthu Spa are areas of interest as they serve the neighbourhood with leisure facilities coupled with the series of Gardens evident on the neighbourhood: Bustani and Eva´s Gardens.



Map of site and surrounding settlement areas
Source: https://www.openstreetmap.org, 2024

Residential Units include Redhill Villas, Redhill Homes, Redhill Heights and they serve residents working in industries and companies around and along Limuru road such as Bata and Fruit Companies. Zreniti house is a prominent Guest House in Limuru with an architectural style that brings the nature into interior spaces with material and orientation of windows and large balconies for views.

Image of Zreniti house
Source:https://www.tripadvisor.com/Hotel_Review-g480204-d15220762-Reviews-Zereniti_House-Limuru_Central_Province.html
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Gikuni is the nearest commercial center as a shopping center.
There are small shops at Kianjogu.
The rest of commercial activity is up to Limuru Town which is 10 km from site by road.

Activities and amenities in Gikuni Shopping Center include:

- Water Sports
- Hiking and Biking
- Exhibition Centers
- Museums and Art Museums, Galleries
- Lifestyle amenities
- Gikuni Guest House with View or Sight seeing Tours.
- Gikuni Police Post, The Nearest.

Sports and events Facilities
Bustani Gardens. It has:

- Parking lot
- Events space
- Viewing deck

Image of Bustani Gardens
Source:https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRKgCPcKEnsO5vT3UCQQoBMlYVQlX3b2wD2BA&s,

Limuru Country Club. It has:

- Golfing
- Cricket
- Swimming

Images of Limuru Country Club
Source:https://nahdytravel.com/limuru-country-club/,

Office Buildings
BATA shoe Company largest in East & Central Africa have the production company with offices and residential spaces for workers.
A recommendable pitch.

Image of BATA
Source:https://labworksea.com/case_studies/bata-kenya-limited/,

Architectural Language
This is a farm office building used by farmers of tea and cereals to address endeavours of the farming community.
Colonial style.

Image of the farm office building
Source:https://www.tripadvisor.com/Attraction_Review-g480204-d1643758-Reviews-Kiambethu_Farm-Limuru_Central_Province.html, 2024

General Context
Limuru, proximally 34 km from Nairobi is generally fertile and of pleasant weather having 165000 in population.
Main road is Limuru road traversing it and goes along Southern edge of Site at 5000m from Limuru Town and site is actually at the heart of the journey of Ruaka(where TWO RIVERS MALL is) to Limuru to join the A104 national main highway linking Nairobi to West.

Growth: Railway, Tea Industry, Bata Shoe factory and Head Office, Milk processing Zones,The Great Buxton Tunnel,St. Paul´s University, Limuru Country club(6 km from Site).,Zereniti House, Mlango Farm, Muthu dvpts, Fruit and JuiCE Companies.

What attracts Investors and Businesses?

US $ 7.5 M Tuskys Mall Development, Naivas and Society Stores New Stores. Cleanshelf is the major Supermarket and it is the only one in Town.

Residents Rely on farming and Factories for employment.
Community boasts of renown people such as Ngugi wa Thiongo, Bshp Gatimu.

Tigoni District Hospital is the main Gvt Hospital 7km away, with Limuru Health Centre.
Nearest Health Center is Thigio Health Center , 2km from Site, and however rurally located, it is recognised in East and Central Africa having also mentored other facilities in the area.

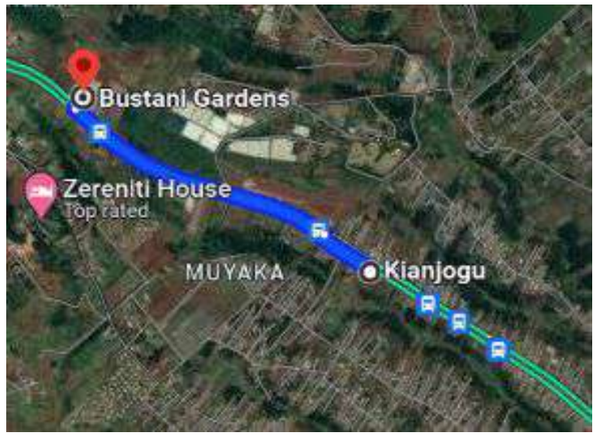
The area also has some of the best high schools in Kenya : Loreto and Limuru Schools and a Limuru International School.

POPULATION CATCHMENT AREAS

Within 10km radius

Kianjogu

- 3 minute drive(1.7 km) via Limuru Rd.
- The area has a low population density.
- It is occupied by middle to low income residents.
- The site is accessible by pedestrians from Kianjogu.

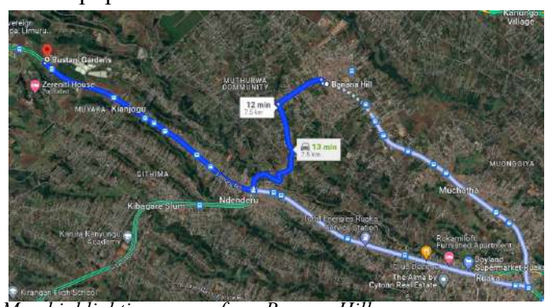


Map highlighting access route from Kianjogu
Source:https://www.google.com/maps, 2024

Within 10km radius

Banana Hill

- It is a 13 minute drive and 17.5km from the site via Ndenderu-Banana Link and Limuru Rd.
- Banana Hill's population constitutes 20 percent of the estimated 100,000 residents within Kiambaa Constituency.
- Multi-racial middle to high income earning population.

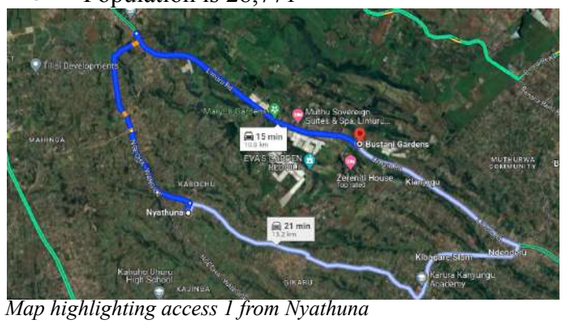


Map highlighting access from Banana Hill
Source:https://www.google.com/maps, 2024

Within 10-15km radius

Nyathuna

- 15 min (10.8 km) via Limuru Rd
- 21 min (13.2 km)via Gitaru Rd and Limuru Rd
- Nyathuna is a town village of low to middle class residents of mainly farmers and traders.
- Population is 28,771



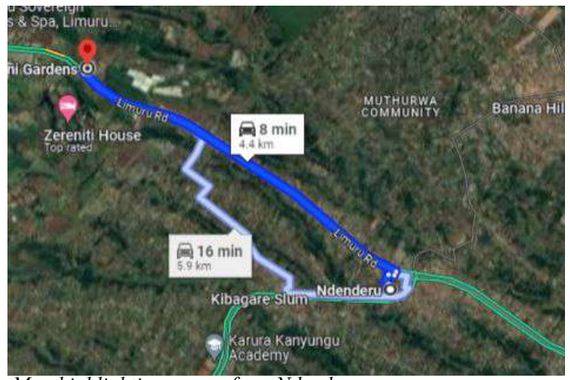
Map highlighting access 1 from Nyathuna
Source:https://www.google.com/maps, 2024

Map highlighting access 2 from Nyathuna
Source:https://www.google.com/maps, 2024

Within 10 km radius

Ndenderu

- 8 min (4.4 km) via Limuru Rd
- 16 min (5.9 km) via Githima Rd
- Population density as at 30/9/2010 was **2,349** persons per sq km.
- It is a commercial and residential town.
- Middle to low income residents.

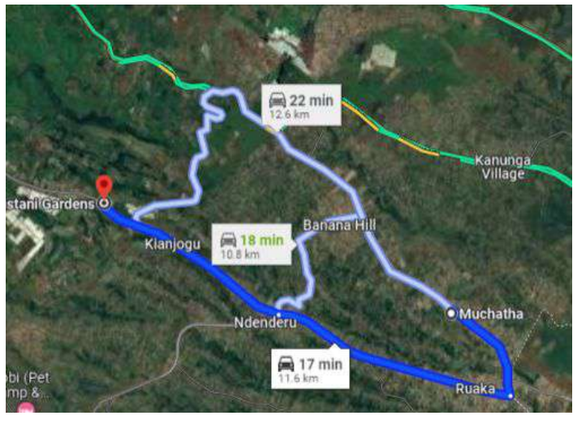


Map highlighting access from Ndenderu
Source:https://www.google.com/maps, 2024

Within 10-15 km radius

Muchatha

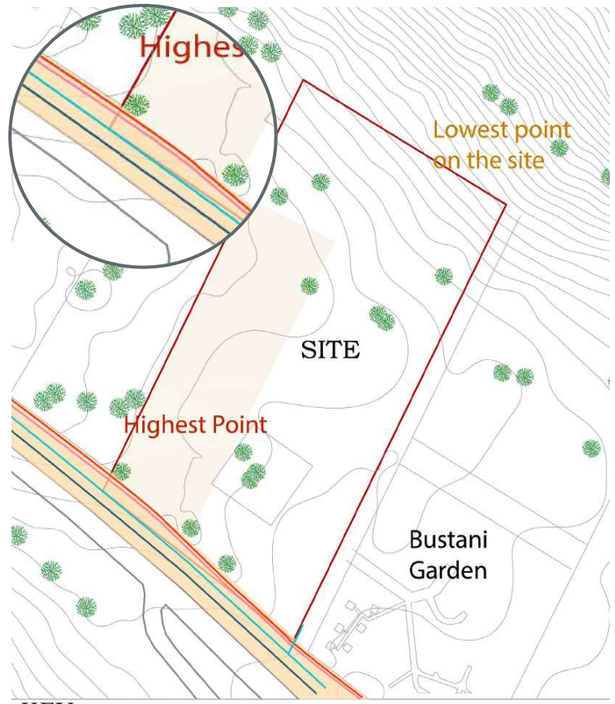
- 17 min (11.6 km)via Limuru Rd and Limuru Rd
- 18 min (10.8 km)via Banana Raini Rd and Limuru Rd
- 22 min (12.6 km)via Banana Raini Rd and Raini Goldhandas Rd



Map highlighting access from Muchatha
Source:https://www.google.com/maps, 2024

The site is suitable for multiple activities since it has multiple catchment areas from areas at a radius of 5 km to more.

UTILITIES



KEY:

- Electricity line
- Fibre optic line
- Water line
- Storm water drainage

Site plan of utility lines
Source: Authors, 2024

Electricity

Electricity supply lines are located along Limuru Road.
The site is along Limuru Road hence electricity can be easily tapped.

Image of electricity lines bordering the site
Source: Authors, 2024

Water supply

The main source of water is from Limuru water and sewerage company.
Sufficient water is supplied to the site through underground pipes .

Images of water supply connection close to site boundary
Source: Authors, 2024

Drainage

Storm water drainage channels have not been firmly established Limuru Road.
A private system has to be set up on site to replace the available broken small channels of drainage.

Images of the drainage channel located adjacent to the site boundary
Source: Authors, 2024

Internet connection

Internet connection is available throughout Tigoni. Fibre cables are running around the site in underground and overhead cables.
A network provider is needed to provide WiFi connection to the site.

Images of internet connection adjacent to site boundaries
Source: Authors, 2024

Waste water Disposal

The area is zoned as a residential zone due to its low population and therefore lacks an established sewer collection system.

RECOMMENDATION

A well placed septic to help in disposal of waste water on site project.
Standard Septic use for commercial areas is 100 litres per person.

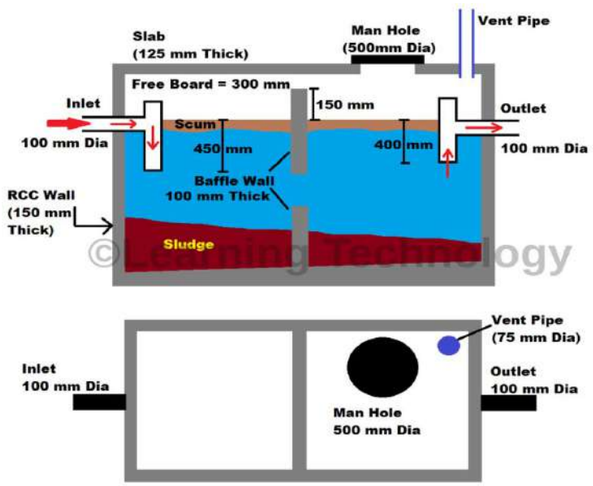


Image of septic tank section
Source:https://learningtechnologyofficial.com/septic-tank-size-for-5-10-15-20-25-50-users/,

SITE REGULATIONS

Site is located in a low density residential zone bordered by an agricultural zone. In its proximity are the Bustani Gardens and Redhill Karting grounds, which are commercial.
Way Leave- (utility lines)- Shall be **3m** or more in width to enable suitable installation of utility lines.

Building line/setback- Building line shall be **6m** from the road which has a width of 9m; 3m from side and rear of the plot.
Plot coverage(max allowed)= 50%
Plot ratio= 250% for residential zones, **400%** for commercial zones
Given that:

Plot ratio = 250%
Gross site area=19,015m^2
Ground coverage= 50%=50/100 X 19,015m^2=9,507.5m^2
Max built area given plot coverage of 25%= 19,015m^{2}X250%= 47,537.5m^2

Max floors of uniform area 9,507.5m^2= 5 floors

Juja, Kikuyu and Limuru have typical trends in their towns. The following table is based on Kiambu-Kikuyu Sub-county Planning requirements:

In the absence of adequate provisions to meet certain demand for space for a particular activity, the available built-up space shall be used (for other than normally permitted use) due to the demand and better economic return- This applies to mixed-use developments combining residential, commercial, cultural, institutional or entertainment purposes.

Building type	Min. plot size (Ha)	Max ground coverage (%)	Plot ratio	Maximum no. of floors allowed
Integrated office complex	20	25	1:1.5	4-8
Integrated sports centre - City Level	30	10	1:0.2	2 (Ground plus one)
Integrated sports centre - Sector Level	10	10	1:0,2	2 (Ground plus one)
Sector playground	5	1.0	1:1.01	1(Ground)
Stadium	5	10	1:0.2	2(Ground plus one)

Table of plot ratio

Buildable area with setbacks

Max allowable plot coverage

Site plans of possible building footprint
Source: Authors, 2024

PART III - DESIGN DEVELOPMENT

TOPICAL CUES ON DESIGN CONCEPTS & PHILOSOPHIES

In order to maintain accuracy of the originally intended meanings and retain authenticity, materials obtained from online sources and published references are acknowledged using essential links and names of authors.

An introductory lecture by: Prof. Paul Mwangi Maringa (PhD), CBS, FAAK, MKIP, Adjunct Professor of Architecture and Planning

UNDERSTANDING DESIGN:

DEFINITION OF DESIGN AND ITS PURPOSE:
Designing is the art of creating something that is both functional and visually appealing.

We design to communicate, express ourselves, and solve problems.

Designing helps us to create products that are more efficient, effective, and user-friendly. Mohammed Adib, https://bootcamp.uxdesign.cc/why-design-understanding-the-purpose-behind-designing-1673d25019c7

ELEMENTS OF DESIGN:
Line, shape, form, space, texture, tone (or value) and colour, are elements or materials from which all designs are built." Hiking Trail Club, https://guelphhiking.com/Elements-of-Design#:~:text=The%20elements%20of%20design%20are,which%20all%20designs%20are%20built.%22

BASIC PRINCIPLES OF DESIGN:

These include, contrast, balance, emphasis, proportion, hierarchy, repetition, rhythm, pattern, blank-empty or void spaces, movement, variety, and unity.

These principles are configured in careful complementation to create appealing and functional designs that have contextual value to users. Design often addresses spaces and artifacts for use by people. It is defined by the intended purpose of use by the client.

Design therefore necessarily is driven by a functional purpose. In this regard it is different from art that may purely expresses ideas or emotions.

(Meg Reid, https://www.vistaprint.com/hub/principles-of-design#:~:text=The%20fundamental%20principles%20of%20design,attention%2C%20a%20point%20of%20focus. Cameron Chapman, https://www.toptal.com/designers/gui/principles-of-design-infographic#:~:text=There%20are%20twelve%20basic%20principles,that%20make%20sense%20to%20users).

GENERAL MEANING OF PHILOSOPHY:

Scholars generally associate philosophy with the study of the fundamental nature of knowledge, reality, and existence. They relate it to theory or attitude that guides behaviour. As a philosophical stance, managing expectations for instance leads one to set modest goals or targets. This as a principle impulse to behaviour aids one to absorb poor or low performance with less vexation and anxiety. The term wisdom has over the years often been used interchangeably with philosophy, often seen as a venture to comprehend basic truths of existence, with its intricate social relationships (https://philosophy.fsu.edu).
Philosophers are seen as a logical thinkers involved in an enterprise to gain completeness of well-reasoned, evidential knowledge. Two philosophical threads that easily come into view hre are:

1. The history of philosophy. These are evident in: (1) Ancient Philosophy, from Socrates to Augustine; (2) Medieval Philosophy, from Augustine to Machiavelli; and (3) Modern Philosophy, from Descartes to Kant.
2. Systematic philosophy. This is manifested in: (1) metaphysics - the study of reality; (2) ethics - the study of what is morally right and good; (3) Epistemology - the study of how we know reality; (4) logic - the study of good arguments; (5) Aesthetics - the philosophy of art, or the study of appreciating the beautiful; and theory of art; and (6) Socio-political philosophy - the study of political and legal theories.

(https://www.depauw.edu/academics/departments-programs/philosophy/what-is-philosophy/#:~:text=Examples%20of%20systematic%20philosophy%20would.the%20study%20of%20appreciating%20the).

PHILOSOPHY OF DESIGN – WHAT DESIGN IS:

Design relies on art as an input and is therefore not exclusively defined by art. There is practice or use of art to creating great design, but the final output of the design process is not art.

Art is creative expression intended to provoke questions and individual interpretation. Art is inspiring, emotional and important. However, it often does not fill a specific need beyond humanities' desire to express itself. Design though is a process intended to solve a problem, and as a result, satisfy a need for users that will ultimately interact with the solution that is developed.

In consequence, design should not be open to interpretation, but instead should define how it is to be engaged with and should guide a user at each stage of that engagement. So, whereas art provokes questions, design proffers solutions.

As design is driven by purpose, it manifests the reality, function or context it seeks to serve. Appropriate design therefore resonates with the end-user client population, and their reality or context of functional needs, socio-spatial settings and cultural realities, all which must be truly felt and be well understood by the designer.

This perspective is well captured in Dieter Ram's dictum, "*Indifference towards people and the reality in which they live is actually the one and only cardinal sin in design",* which reflects his design philosophy of Less, but better, that accorded premium to a functionalism design approach, placing function before form.

Design is a never-ending cyclic spiral rather than a journey to an end state. It is never perfect. It is a continuous process subject to change through a user feedback loop. Its suggested solutions, evolves with a dynamically transforming complex social context, which changing circumstance also receives and responds to the impulses from the design itself. As such, design is always in transition, always in cumulative self-reinforcing iterations, and can never quite attain an end state perfection or perfect fit.

Design is an informal sequencing of thought and reflection. It is neither a set of tools, nor a standardized process. As such, every problem presents its own unique set of characteristics, such that there is no rule of thumb route or sequence of activities to follow in order to achieve a favourable solution.

Design must be easily legible to the user. It therefore ought to reflect its intended function in a simple forthright manner, without ambiguity. Design elicits empathy with users and by extension, the subjective complex and ever shifting emotions of pleasantness, ease, comfort, interest and therefore delight.

(Jessee Weaver, "What is your design philosophy", 2015,
https://hairyelefante.medium.com/what-is-your-design-philosophy-a32d43985899).

POPULAR DESIGN PHILOSOPHIES:

1. Form Follows Function (Architect Louis H. Sullivan). In this mold, design is expected to be straight forward, relating expression to functional needs of users. Spaces then must derive character from the desired uses of such spaces.

   The building envelop and resulting forms are also expected to express the internal functions of the buildings they embellish. To this extent, and consistent with a view that aesthetics must be founded upon functional value, Frank Lloyd Wright averred that form and function are one.

2. Details are not mere details, rather they make the design (Architect Charles Eames). This attitude towards design is anchored in the common adage that "God or the good God is in the details", that affirms the value of details and the need to take them seriously.

   The saying was coined much earlier first by Gustave Flaubert, followed by the German art historian Aby Warburg and then architects Ludwig Mies van der Rohe and Le Corbusier.

   For this orientation, designers are encouraged to give every aspect of a design full attention. The understanding that great design is both pleasing and functional and that it emerges from a composition of well-crafted details finds a home in this philosophy too. (https://blog.proto.io/10-of-the-best-design-philosophies-of-all-time/:).

3. To provide meaningful architecture is not to parody history, but to articulate it (Architect, designer and artist Daniel Libeskind). The intention here is to display the horror of history so as to engender learning and understanding while integrating it with hope for a better tomorrow. Libeskind strove to attain this in his designs of the Jewish Museum in Berlin, Denver Art Museum's extension in the U.S., and the Imperial War Museum in England. This thinking resonates with Frank Gehry's perceptions of deconstructivism as a philosophy for designing a better future from the brokenness of human experience. His pronouncement that Architecture, should speak of its time and place, while yearning for timelessness finds resonance here too.

Here, architecture is expected to serve as a repository of human experiences past, present and future with full deep historical value, as a timeless archive. It should avoid mere replication of artifacts and ideas of the past but instead infuse full, relevant present meaning to designs. Also relevant here is the philosophical poise of design as a cultural artifact. Yves Behar, chief creative officer of Jawbone and arguably the most influential industrial designer alive, asserts that the work of a designer is really at the intersection of commerce and culture. True value in designs therefore emerges when they are nested in and exude distinctive cultural flavour. https://blog.proto.io/10-of-the-best-design-philosophies-of-all-time/:).

4. Life is chaotic and buildings should reflect this reality (Architect Frank Gehry). Interpreted here is the deconstructivism design philosophy to defy tradition and expand personal choice, in the sense of appreciating that, life is not a set of monotones and reduced simple rules, but rather an ever-changing dynamic of diversity of preferences and choices. Gehry ventures to capture this thinking in his design of the Guggenheim Museum.

5. Anything that exists only to satisfy the ego of the designer must be eliminated, (Eric Reiss, Theoretician, consultant and author).

Emphasis here is laid on the need to subsume the preferences of an architect and instead give pre-eminence to the priorities of the user. Consistent with this is the associated philosophy that a design is not complete until it is put into use (Brenda Laurel, researcher and a videogame designer). Of prime value here is the end consumer who then is ascribed the dominant role of validating all design. Also cast in this same framework is the philosophy that all fine architectural values are human values, else they are not valuable (Architect Frank Lloyd Wright). The persuasion that humanity is at the centre of all design for man and society is accorded centre stage.. Buildings and their contrived environments must therefore reflect the essence of humanity and its culturally contextual values.

In the absence of such inclinations, architecture becomes stale and irrelevant. Value is seen in the philosophical thought that while good design is obvious, great design is transparent (Joe Sparano, Graphic Designer). In such an understanding, designers are encouraged to imagine how people use their designs as a way to keep the designs accessible, simple legible and easy to use.

6. Simplicity is not the absence of clutter (Jonathan Ive, designer for Apple). Integral to this thinking is the ongoing discussions kicked off by Mies van der Rohe of 'less is more", and repudiated by Robert Venturi "less is a bore" in his writings on complexity and contradictions in architecture. Simplicity then should not require reduction in diversity and intensity of variance, but rather an introduction or complex order and clarity. Reinforcing this thinking is the notion that good design is as little design as possible.

Further, thought is underpinning here on the conviction espoused by Jonathan Ive and Stefan Sage Meister, Diego Armani and Ludwig Mies van der Rohe among others that is founded on the value of controlled reduction or minimalism (less is more) as opposed to unwarranted embellishment. (https://blog.proto.io/10-of-the-best-design-philosophies-of-all-time/ :).

7. Good design redefines itself, rapidly. Alexander Rodchenko, one of the founding fathers of the constructivist movement, advocated for making multiple variations of the same subject to capture its essence, declaring that "o*ne has to take several different shots of a subject, from different points of view and in different situations, as if one examined it in the round rather than looked through the same keyhole again and again*". Accordingly, therefore, design does not exist in isolation but rather it emanates from and reflects its client society changing and adapting in rhythmic iterations and at pace with corresponding changes in society. (https://blog.proto.io/10-of-the-best-design-philosophies-of-all-time/ :).

The preceding discussion restates and articulates the ideas of Karen Elyssa, 2020, in her writing "10 Design Philosophy Ideas for Architecture Students"**,** https://girlbossarchitect.com/2020/07/27/10-design-philosophy-ideas-for-architecture-students/).

A GENERAL UNDERSTANDING OF CONCEPTS:

A concept may be understood to be a core or basic abstract idea, impression, notion, or thought (https://www.vocabulary.com, https://www.merriam-webster.com). It reflects an intention that is frequently illustrated through words, images and sketches (http://airfocus.com).

SPECIFIC MEANINGS OF CONCEPTS:

Architectural concepts are abstract ideas or notions that are provoked by particular user needs, functional and contextual instances. They infer or hint at essential meanings or values of a specific design circumstance. Though are abstract and intangible, they are the main essence behind all decision-making in the subsequent design process.

Architectural concepts anchor ideas that are conceived out of an initial incisive analysis of the design functions, its setting and the nature and values systems of the target users. This is an absolutely necessary first step of the design process.

Concepts constrain the design to set philosophical boundaries, according the singular identity of the design. They ward off compromises and distortions that may arise from possible digressions away from the seminal core values of the design. (https://www.novatr.com/blog/architectural-concepts-types).

SOURCES OF CONCEPTS:

Competitive concepts derive from a good understanding arising from an in-depth analysis of the functional needs and planning predilections, accessible technology and physical environment (terrain, flora, fauna, climate, weather – rainfall, sunshine, water and wind), culture (meanings and identity), and site context (circumstances, surroundings and prevailing structure of space use). In this way, they offer a clear framework for well-reasoned, rational decision making, (Maringa & Okello, 2006).

NATURE OF CONCEPTS:

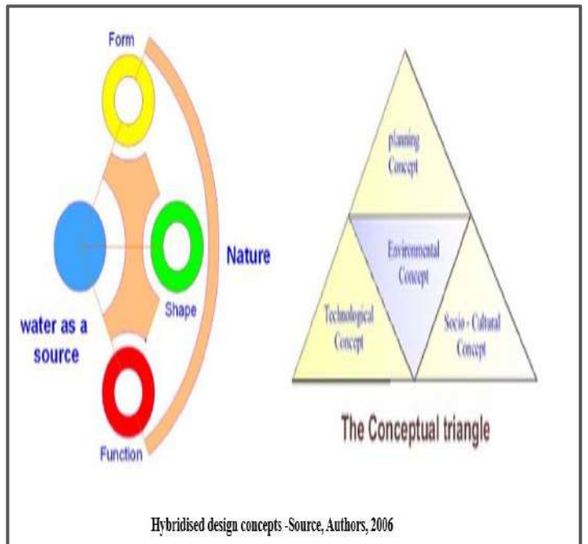
Concepts are dynamic. They evolve constantly throughout the design lifetime as new perspectives of the design and locational areal parameters come into view. Concepts therefore metamorphose with a changing understanding of the holistic design context and user needs as well as internal functional interactions. A designer can cumulatively assemble, different types of architectural concepts in a design throughout the design development process (https://www.novatr.com/blog/architectural-concepts-types).

SYNTHESIS OF CONCEPTS:

There are multiple concepts in every design, and these align to the many diverse imperatives that drive the designs. Principally, designs will rely on the following three classifications of concepts:

a. Planning and organisation concepts – site, spatial character and meaning.
b. Technological concepts – structural order, assembly, materials, environment.
c. Socio-cultural concepts – meaning, identity, structure.
d. Environmental concepts - the site and its natural and developed physical context.

These translate from the holistic context of the design imperatives and location through images that are frequently abstracted into functional analogies/symbolism, metaphors or allegories. At times biomimicry of natural and created artifacts in the environment are synthesised for expression or structure and meaning and captured into equivalent visual representations.



Hybridised design concepts -Source, Authors, 2006

ANCHORING CONCEPTS ON DESIGN THEORY:

Appropriate design approaches are brought to bear in order to integrate the concepts and their representative analogies into space organisation and form making in an orderly manner along the design process. The standard four, iconic, pragmatic, canonic, analogic design approaches can be brought on board, either singularly, or in complementation, as they are able to provide value to the design solution sought.

The wide array of architectural styles and the emerging neologisms or variants that are on hand throughout recent history of evolving architectural practice, are referenced freely though critically. These cover the range of regionalism, postmodernism, functionalism expressionism, eclecticism, structuralism, historicism and the rather recent radical deconstruction/disintegration/destruction.

They are, selectively grafted into the process of creating compulsive, evocative images, order, identity and meanings that manifest the selected concepts effectively to produce imageable environments, forms or edifices.

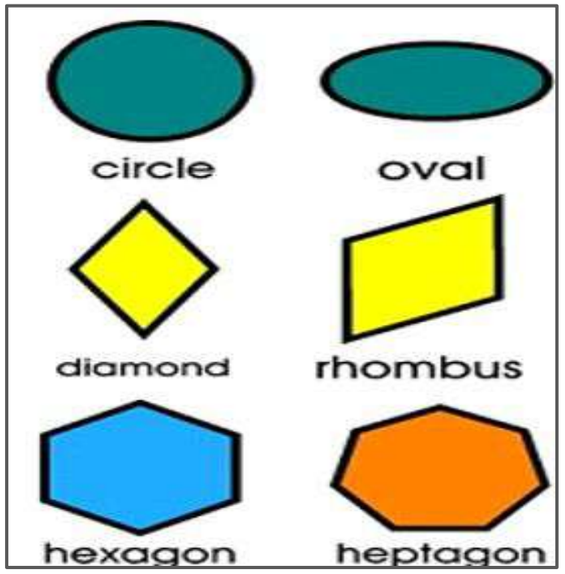
ELEMENTAL DEFINITION OF FORM:

A Form is a three-dimensional (3D) object or void with real or implied mass, volume, height, width and depth. Geometric forms are contrived into visual or physical expressions using, squares, rectangles, circles, and polygons as flat shapes. Shapes are modelled through 3D expressions of cubes, spheres or polyhedra and in this way take on forms. The latter covers the range of four sided tetrahedrons, six sided hexahedrons, eight sided octahedrons, twelve sided dodecahedrons with equal pentagonal faces, and twenty sided icosahedrons (Ching, 2015, Vandyke, 1990). Forms are volumes in three dimensions as prescribed by length, width and depth or circumference and radius (Vandyke, 1990). In consequence, forms manifest scale, size, colour & texture (surface treatment), position, orientation, visual motion or inertia/stability (Maringa & Okello (2006).

Visual and physical art as well as architecture that embraces three dimensional sculptures and models is expressed through forms. A circle therefore is a shape that corresponds in form to a cylinder and sphere. In turn, a triangle is a shape which translates into the form a pyramid. Forms, can also be irregular or amorphous and these too find use in design. (Hiking Trail Club, https://guelphhiking.com/Elements-of-Design#:~:text=The%20elements%20of%20design%20are,which%20all%20designs%20are%20built.%22).

DEFINITION AND TYPES OF SHAPES:

A shape can be defined as a two-dimensional area that stands out from the space next to or around it on account of well delineated or implied boundaries. These boundaries may assume the form of physical lines and barriers, change of patterns or differences of value, colour, and texture. Drawings are bounded by lines that separate internal space & the surroundings.

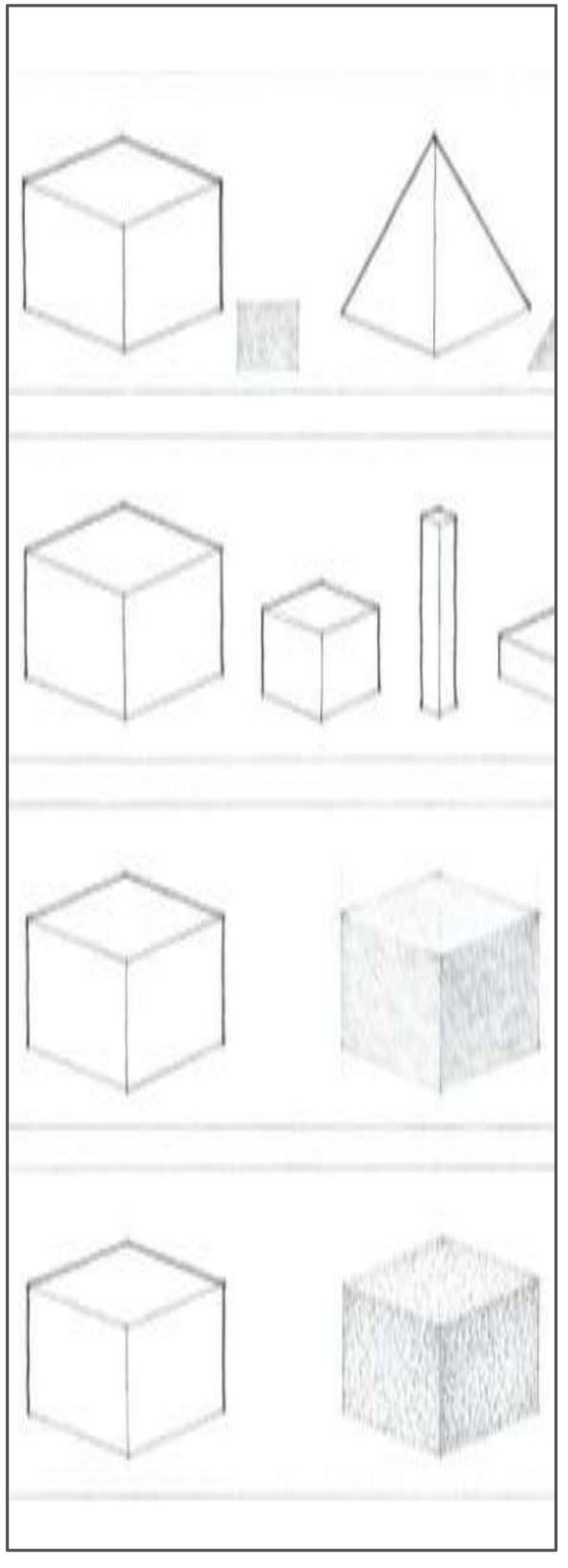


These lines serve as barriers that place the drawing and the shape it represents apart when disposed against a background of papers, boards or tables.

Basic shapes available to designers include geometric shapes that often reflect regular proportions and definite shapes as seen in squares, circles, and triangles. Rhombuses and other diverse polygons are other variations that assume unequal proportions while retaining recognisable shape. It is therefore common to classify geometric forms into the following two primary sets:

a. Curvilinear shapes that generally display smooth curvature.
b. Rectilinear shapes that are characterised by conspicuous angularity, with the convergence of their constituent lines ranging from acute to obtuse angles.

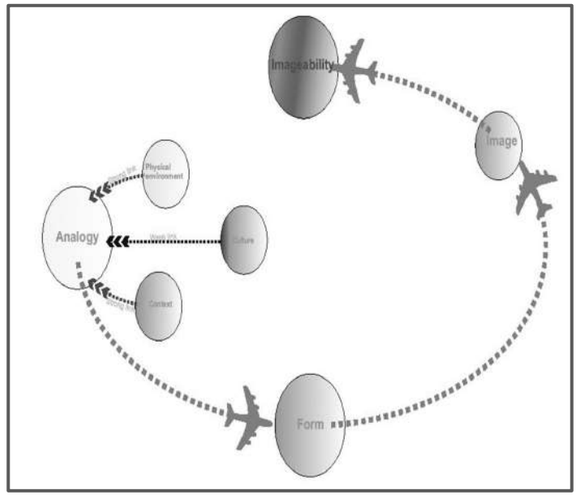
Then there are organic shapes that commonly manifest complex irregular patterns of intricate proportions that evoke nature, with indefinite edges, and free-flowing outlines. (Hiking Trail Club, https://guelphhiking.com/Elements-of-Design#:~:text=The%20elements%20of%20design%20are,which%20all%20designs%20are%20built.%220).



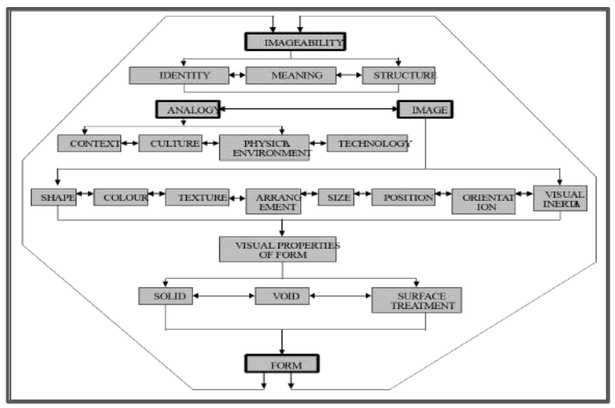
IMAGEABILITY:
Buildings have certain qualities that give them a high probability of evoking a strong image in any given observer (Lynch 1960).

This is imageability that may also be termed legibility or even accentuated visibility. It is an image with clarity and harmony of form, which is well formed, distinct and remarkable (Stern 1914 -15, Lynch 1960).

ANALOGY, FORM AND IMAGEABLITY, Maringa & Okello (2006).



DERIVING IMAGEABILITY FROM FORM, Maringa & Okello (2006)



THE EMOTIONAL BASIS or MEANING OF ARCHITECTURE, Maringa & Okello (2006)
Metaphors and analogies that are founded on local codes (as is expected of architectural metaphors), are here abstracted from the adjacent ocean, its animal life and seafaring vessels, are extensively used too, as sensory cues that evoke rich meaning to the user.

Metaphors are brought into use with 'wit' – an indirect innuendo that provokes the user to make thought provoking, but nevertheless believable associations.

Drama in the design scheme is accelerated by the use of a collage of metaphors. Mystery and power on their part are enhanced by intentionally keeping the metaphors only slightly suggestive – in a sense, camouflaging their meanings from obvious interpretation.

Metaphors & analogies founded on local codes used as sensory cues that give meaning, Source, Maringa & Okello, 2006.

Mixed or hybridised metaphors give even more compulsive value to the design in a synergistic contrivance providing exciting emotional energy.

Together, this blend of metaphors provides the basis upon which people find their emotional affinity or connection with the built form.

The users are attracted in this manner to these forms because by design, the forms are contrived to carry metaphorical analogies that people can relate to easily.

Forms designed to carry metaphorical analogies that people can relate to easily, Saring & Okello, 2006

Man is taken here in agreement with theory, to instinctively perceive the large scale as hostile and threatening unless it is moderated by, or carefully crafted from a well-ordered small scale.

The desired scaling then is achieved here at the level of detail, materials, and the smaller building elements, whose size approximates well, man's anthropometrics.

A large scale that is moderated by a well-ordered small scale, Saring & Okello, 2006

Similar reflections apply here once more that: *Man is taken here in agreement with theory, to instinctively perceive the large scale as hostile and threatening unless it is moderated by, or carefully crafted from a well-ordered small scale.*

The desired scaling then is achieved here at the level of detail, materials, and the smaller building elements, whose size approximates well, man's anthropometrics.

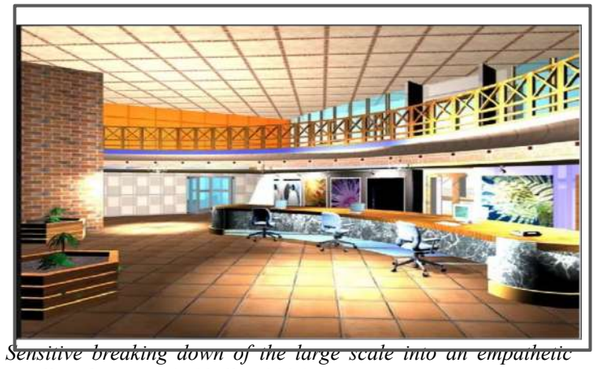
Perceptively beautiful forms that establish an emotional link with the elemental structural order, Saring & Okello, 2006

In this way, a design scheme achieves a natural, comfortable feel. Its forms regardless of shape or use are then perceived as being beautiful because they are in this manner enabled to establish an emotional link with the elemental structural order of the scheme.

They present a status of emotional well-being, as users spontaneously are able to relate to detail or structure, given the articulate, sensitive breaking down of the large scale into an empathetic small scale.

In this regard, then, these two scales become well connected, which event in common theory is conventionally adjudged to be successful design.

The scheme then satisfies well the emotional basis of architecture that is expected of good design.



Sensitive breaking down of the large scale into an empathetic small scale, aring & Okello, 2006

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3. Paul Mwangi Maringa & Philip Ochieng Okello, 2012, "Didactic Design of Imageable Architecture, ISBN-10: 1479309702; ISBN-13: 978-1479309702 – CreateSpace Independent Publishing Platform: https://www.amazon.com/Didactic-Design-Imageable-Architecture-Maringa/dp/1479309702/ref=sr_1_11?qid=1687165050&refinements=p_27%3AProf+Paul+Mwangi+Maringa&s=books&sr=1-11

CHAPTER TWO

DESIGN SOLUTIONS

SPORTS CENTRE DESIGNS

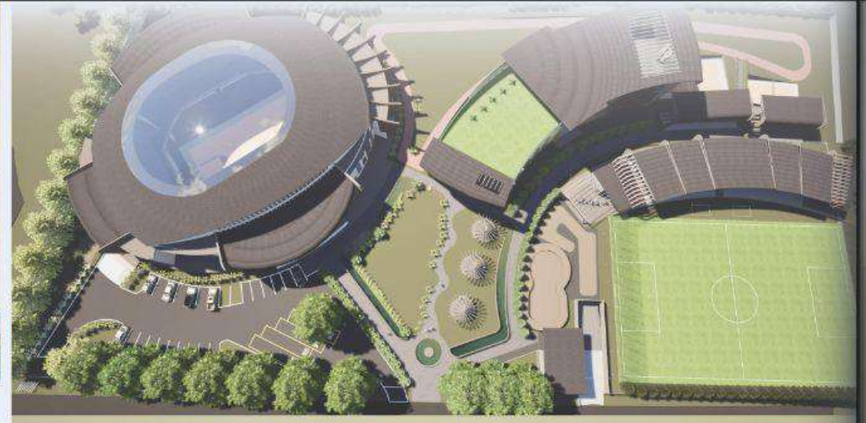
B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

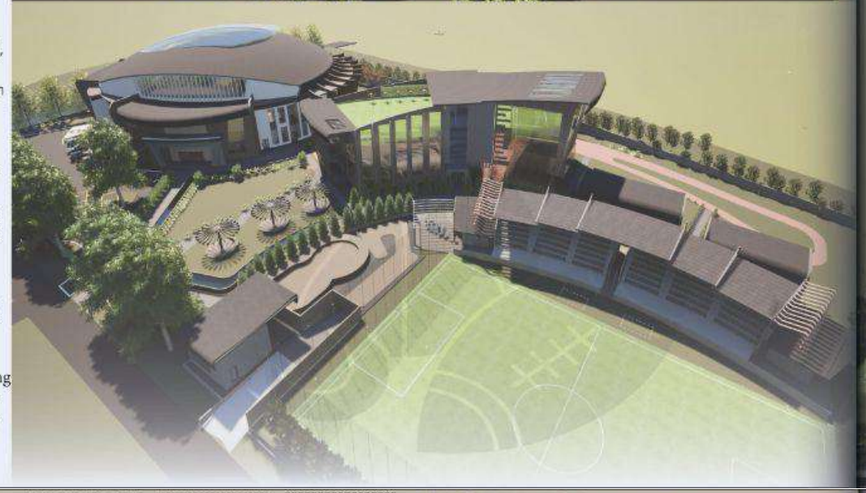
Anthony Kaiser
Brian Kengo
Ridhwan Sheikh

ANTHONY KAISER

NAME: Anthony Kaiser Okemwa, BAS IV.
INSTITUTION: Department of Architecture & Interior Design (DAID), Faculty of Engineering and Architecture (SEA), Kenyatta University (KU).
EMAIL ADDRESS: athoniekaiser78@gmail.com

BIOGRAPHY:
Anthony Kaiser Okemwa is an architectural visionary, weaving creativity with experience from E.D.G & Atelier and dnD Limited. His journey through residential elegance at Thika Greens and the grandeur of Jupiter Industrial Park reflects his dedication to transforming ideas into tangible realities. His passion lies in the intricate dance between physical architectural models and cutting-edge technology, embodying the future of design. Beyond architecture, Anthony's work with Classfyme Foundation reveals his commitment to guiding others towards their dreams, using the power of AI to unlock potential and shape destinies. His story is one of passion, innovation, and purpose.



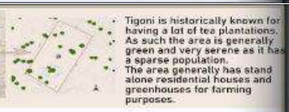


TIGONI SPORTS CENTER

In the serene embrace of Tigoni's rolling hills, where nature whispers secrets of timeless beauty, emerges the Tigoni Sports Center—a fusion of tradition and innovation. This architectural marvel, conceived with the heart of a visionary, honors Kenya's vibrant culture while celebrating the spirit of sportsmanship. The design intricately weaves local materials, echoing the rich heritage of the land, with modern forms that inspire and uplift. Each corner of this center speaks of harmony, from the lush green terraces to the expansive arena, all crafted to nurture athletic excellence. Here, sports and culture converge, creating a sanctuary for champions and dreamers alike.

BACKGROUND INFORMATION

The site is situated on Limuru Road and can be reached from Nairobi via Ruaka and Ndenderu (37 minutes) or Limuru via Kabuku (18 minutes).
The site, resembling a parallelogram, has a width and length of 100m and 200m respectively, resulting in an area of 20,000 sqm, which is 4.94 acres.



Tigoni is historically known for having a lot of tea plantations. As such the area is generally green and very serene as it has a sparse population.
The area generally has stand alone residential houses and greenhouses for farming purposes.

JUSTIFICATION AND NEED

SCENIC LOCATION:
Tigoni is known for its picturesque landscapes and cool climate. The scenic surroundings can create a pleasant and attractive environment for a sports center, enhancing the overall experience for visitors and participants.

TEMPERATURE AND CLIMATE:
The cool climate in Tigoni can be advantageous for outdoor sports activities, providing a comfortable environment for both participants and spectators. This can make it an ideal location for sports that require moderate temperatures.

PROXIMITY TO TOWNS (LIMURU, NAIROBI , RUAKA.:
Tigoni's proximity to Nairobi, the capital city of Kenya, makes it easily accessible to a large population. This can attract a diverse range of participants and spectators, increasing the center's potential user base.

COMMUNITY AND DEMOGRAPHICS:
The local community's interest in sports and recreational activities to replenish the busy lifestyle. There is a strong demand for such facilities in the area, hence increases the likelihood of the sports center being well-received and utilized.

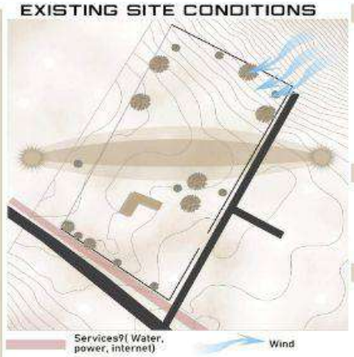
CLIENT

Kiambu County Government:
The County Goverment aims for economic development and transformation through: promotion & development of youth & sports for a vibrant sportingindustry & empowered youth.
The department's vision is to lead in creative and innovative youth empowerment, achieving sporting excellence & embracing top of the range effective and efficient communication models.

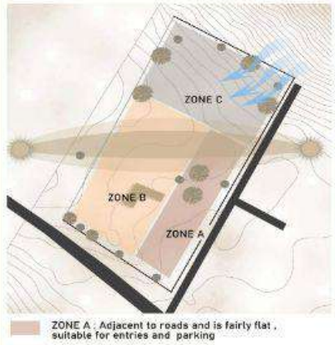
The Kenya Basketball Federation in cooperation with the county , has the best interest in promoting the basket ball game as the area as the performing school and enthusiasts for the game and would best suite the area.

The Project involves the design of A Proporsed Sports Complex. The project's site is located in Tigoni, Limuru in Kiambu County.
The Sports Complex is to provide spaces for different games, indoor & outdoor. Other facilities to be include retail & recreational spaces

EXISTING SITE CONDITIONS



COMPOSITE MAP

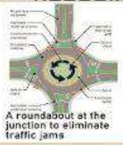


ZONE A : Adjacent to roads and is fairly flat , suitable for entries and parking
ZONE B; Fairly flat and hence suitable for the building positioning
ZONE C; steeper side of the site , suitable for elevated structures and basement parking

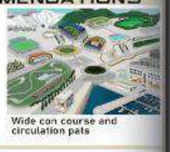
ACCESS

From Limuru town: Limuru bridge → Muniu family Kamandura Junction → Site
From Kiambu Town: Kamunga Village → Raini shopping center → Banana Market → Ndenderu Junction → Site

RECCOMMENDATIONS



A roundabout at the junction to eliminate traffic jams



Wide con course and circulation pats

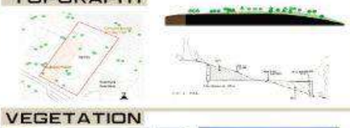
CLIMATE

Limuru is relatively has temp lows of 16 and is of 28 and is relatively cold and foggy most times of the year

Building orientation should maximize solar gains

The fields should be oriented to north to allow for playability

TOPOGRAPHY



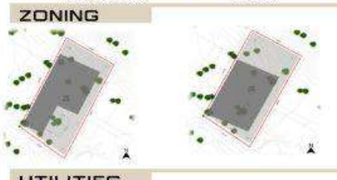
Drainage to the lowest point i.e. north of the site.
Location of the septic and soak pit should also be at the lowest point of the site.
Parking should be located at the generally flat part of the site.
Grade the basement parking and elevated outdoor sports area

VEGETATION

Existing plants | Proposal

Among the planted subsistence and cash crops on site include Napier grass, sunflowers, banana trees, kales and spinach.

ZONING



Way Leave- (utility lines)- 3m or more in width
Building line/setback- 6mfrom a 9m wide road; 3m from side and rear of the plot.
Plot coverage(max allowed)= 50%
Plot ratio= 250% for residential zones, 400% for commercial zones
Plot ratio = 250%
Gross site area=19.015m²
Ground coverage= 50%=50/100 X 19,015m²=9,507.5m²
Max built area= 19,015m²X250%= 47,537.5m²
Max floors of uniform area 9,507.5m²= 5 floors

UTILITIES

The area is zoned as a residential zone due to its low population and therefore lacks an established sewer collection system.

A well placed septic to help in disposal of waste water on site project.
Standard Septic use for commercial areas is 100 litres per person.

PROJECT JUSTIFICATION

EDUCATIONAL OPPORTUNITIES:
To provide a space for physical education classes and extracurricular activities.
To promote holistic development of students, fostering teamwork, discipline, and leadership skills.

CULTURAL AND SOCIAL INTEGRATION:
To serve as a focal point for community gatherings and events, fostering a sense of unity and shared identity.
Incorporating local cultural elements into the design to make the center a reflection of the community.

ECONOMIC IMPACT:
job creation during the construction phase and ongoing employment opportunities for maintaining the sports center.
The sports center to attract events, tournaments, and visitors, contributing to local businesses and tourism.

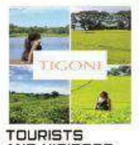
COLLABORATION WITH LOCAL INSTITUTIONS:
Partnerships with local schools, colleges, and sports clubs, a hub for collaborative initiatives and shared resources.

FUTURE-PROOFING THE DESIGN:
Consider how the design can adapt to future needs and trends in sports and recreation, ensuring the sports center remains relevant and valuable over time.

TARGET CLIENTELE

SPORTS ENTHUSIASTS:

HEALTH AND WELLNESS SEEKERS:



TOURISTS AND VISITORS:

EVENT HOSTING:

STUDENTS AND SCHOOLS:

LOCAL RESIDENTS:

LOCAL SPORTS TEAMS AND CLUBS:

BRIEF FORMULATION

SPORTS AND ACTIVITIES

- Archery and darts
- zhumba and wellness
- Judo space
- skating
- Fitness
- Jogging
- Basket ball
- Pool games
- Lawn tennis
- Badminton
- Table tennis
- Football

PROGRAMME

Administration
Reception and lobby
Offices
Board room and meeting rooms
Kitchenette and break away
Vip and sponsor section washrooms

Spectators section
Entry lobby
Ticket station
Check point
washrooms
seating area
Snack area

Activity zones
Multi purpose indoor arena for basketball, handball, volleyball

Indoor spaces for Table tennis, badminton, gym and fitness, judo spaces, pool table, screen games

Changing rooms and dressing rooms
First aid zone

Outdoor spaces
7 aside football
lawn tennis
Paddle tennis
community park
Jogging track
Skating park

ADMINISTRATION OFFICES

Functionality: Office spaces for management, staff, and event organizers.
Floor Area:
250 square meters.
Functional Requirements:
Workspaces: Desks, meeting rooms, and storage spaces for administrative purposes.
Communication Systems: Phones, internet access, and office equipment.
Security: Controlled access and security systems.
Parking Area
Functionality: Parking for visitors, staff, and participants.
Floor Area:3,000 square meters both on the ground level and basement parking
Functional Requirements:
Layout: Efficient layout for easy entry and exit.
Accessibility: Spaces for disabled parking, drop-off zones, and emergency access.

MAIN ARENA

Functionality: This will be the central area of the sports center, designed to host a variety of indoor sports and large-scale events.
Floor Area:
Approximately 2500square meters,
Functional Requirements:
Seating: Capacity for 1500- 3,000 spectators.
Flooring: High-quality sports flooring suitable for basketball, volleyball, and other indoor sports.
Lighting: Adequate overhead lighting for events and matches, compliant with international sports standards.
Acoustics: Sound systems for announcements and events.
Ventilation: HVAC systems to maintain a comfortable environment.

INDOOR GAMES

Functionality: Dedicated spaces for indoor games like badminton, table tennis, and gym activities.
Floor Area:
1200 square meters,
Functional Requirements:
international standards Court Dimensions(e.g., badminton courts should be 13.4m x 6.1m).
Equipment: Storage for sports gear and equipment.
Ventilation: Proper air circulation to maintain an optimal indoor environment.
Spectator Sections
Functionality: Designated seating areas for spectators during events.
Estimated Area:550 square meters
Seating: Comfortable, tiered seating with good visibility of the playing areas.
Access: Easy access to amenities like restrooms, food stands, and exits.

OUTDOOR FIELDS

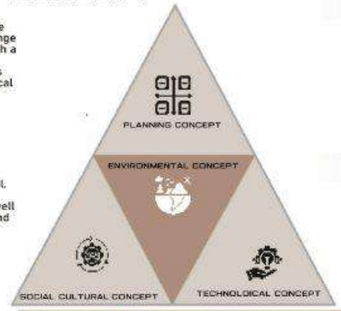
Functionality: Fields for outdoor sports like 7 aside football
Floor Area:
Football field and specttor seating: 4000 square meters.
Jogging track:2500 square meters.
Functional Requirements:
Surface: Grass or artificial turf for durability and ease of maintenance.
Drainage: Effective drainage systems to prevent waterlogging.
Seating: Temporary or permanent seating for spectators.

CONCEPT

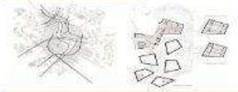
PHILOSOPHIES..
"A design rooted in reality"
Design changes with time its adaptable to the environmental change, social change or change in the market goal. The aim is to come up with a design that is going to rooted to te existing features and able to adapt to te chanin needs and trends respecting the cultural and physical location and time,
A design that can be used for various sport activities and also involve the different age group i.e. From young to old people.

"Form follows function" frank Lloyd
The activities of the building are well represented into the form of the building goal. The aim of the design should focus on the activities of the building and this should be well translated to the design both on the inside and the outside, including the facades and the landscape design

HYBRID PHILOSOPHY
A functional design inspired by reality and timelessness. The nature of sports is dynamic with aspect of winning and losing. These aspect can be reflected in the design through variuos analogies and hence the desin sould be embrace dynamic nature of sports



ANALOGIES ..



PLANNING CONCEPT-
An extrovert planning concept to reveal the dynamic nature of sports enable the visual and physical connection with the serene surrounding

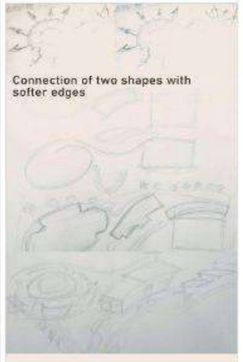
ENVIRONMENTAL CONCEPT
- The natural environment of Tigoni area has rolling hills. This informs a seamless flow and form which can be reflected on the dynamic nature of sports
- The climatic conditions in the are a bit cold and hence the informs an orientation that facilitates solar gain.

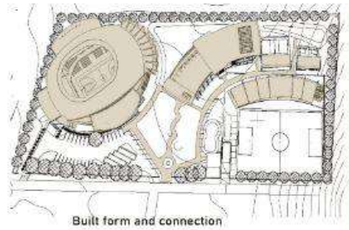
SOCIO-CULTURAL CONCEPT..
The main activity is farming with people from various diversities. In the context the farm products are placed in a basket whic has intertwined reeds (honeysuckle) that enables it to form little spaces that act as louvre to allow the product to aerate

Technological concept
The dynamic nature of sports advocates for a design inspired by the different shapes that can be picked from the tea picking basket and kiondo tat are both used for harvesting an attribute that can be linked to sports , achieving results.

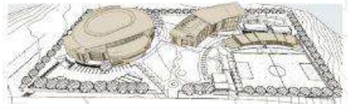
CONCEPTUALISATION

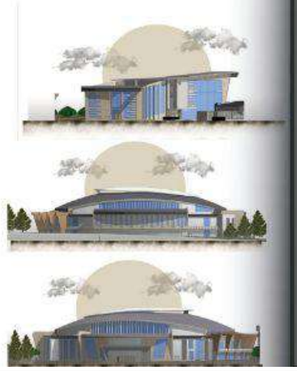
DYNAMIC UNITY





Built form and connection





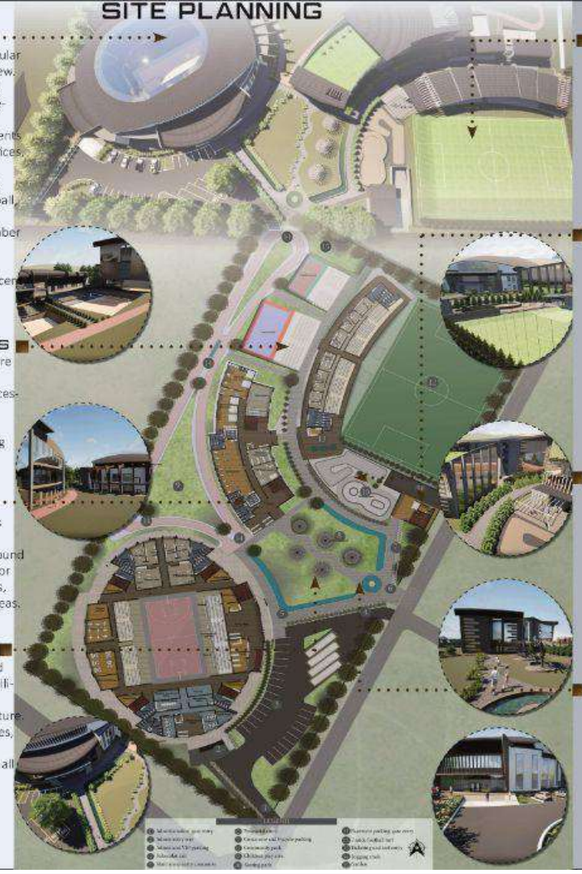
SITE PLANNING

1. MAIN ARENA
Central and prominent in the plan, the main arena is circular in shape with a large, domed roof visible from the top view.
The layout includes several entrances for administration, VIPs, and general spectators, along with vehicular and pedestrian access points.
The first-floor plan of the arena shows seating arrangements surrounding a central court, with spaces allocated for offices, storage, and other amenities.
The arena is designed to host large indoor sports events, with a multipurpose court suitable for basketball, volleyball, and other sports.
Seating Capacity: Designed to accommodate a large number of spectators with easy access to amenities such as restrooms, food stalls, and emergency exits.
Parking: VIP and general parking areas are provided adjacent to the arena.

2. TENNIS AND BASKETBALL COURTS
These courts are located near the community park and are visible as smaller rectangular sections.
The courts are accompanied by seating areas and are accessible by pathways from other parts of the sports center.
Surface Material: Hardcourt surfaces are used.
Lighting: Courts are equipped with floodlights for evening use.

3. INDOOR GAMES FACILITY
Positioned adjacent to the main arena, the indoor games facility has a curved design, with three distinct floors.
Each floor is designed for different activities, with the ground floor gym facilities with exercise equipment and spaces for fitness classes, the first and second floor to indoor courts, and the third floor to additional sports or recreational areas.

4. COMMUNITY PARK AND GARDENS
The community park and surrounding gardens are placed centrally, acting as a green buffer between the sports facilities and offering a relaxing space for visitors.
Includes walking paths, seating, and possibly a water feature.
Landscape Design: Should include a variety of plants, trees, and seating areas to create an inviting environment.
Accessibility: Paths should be designed to accommodate all users, including those with disabilities.



5. OUTDOOR SPORTS FIELD
A large outdoor sports field is located towards the right of the plan, suitable for football or other large field sports.
Surrounding facilities include seating for spectators, with pathways leading to and from the field for easy access.
Field Surface: Made of artificial turf
Drainage and Maintenance: French drains system is used to ensure the field remains in good condition, even in adverse weather.

6. PARKING AND ACCESS
Multiple parking areas are strategically placed near the main facilities (arena, indoor games) and near the entrance to the site.
The layout ensures easy access to all major parts of the sports center, with separate entrances for vehicles and pedestrians.
Capacity: Parking areas should be sized to accommodate peak visitor times, with spaces for both standard and accessible parking.
Circulation: Clear signage and designated entry/exit points to ensure smooth traffic flow.

7. SKATING PARK AND JOGGING TRACK
The skating park is located near the parking area, providing a dedicated space for skateboarders and rollerbladers.
The jogging track encircles the community park, offering a scenic route for runners and walkers.
Surface Material: Smooth, durable materials for both the skating park and jogging track to ensure safety and longevity.
Safety Features: Railings, barriers, and proper signage to guide users.

8. CIRCULATION PATHS
Pedestrian and Bicycle Paths:
Well-defined pathways connect different facilities, ensuring ease of movement throughout the sports center.
Accessibility: Paths are designed to be accessible to all, including ramps and smooth surfaces for wheelchairs and strollers.

ACCESS & WAYFINDING

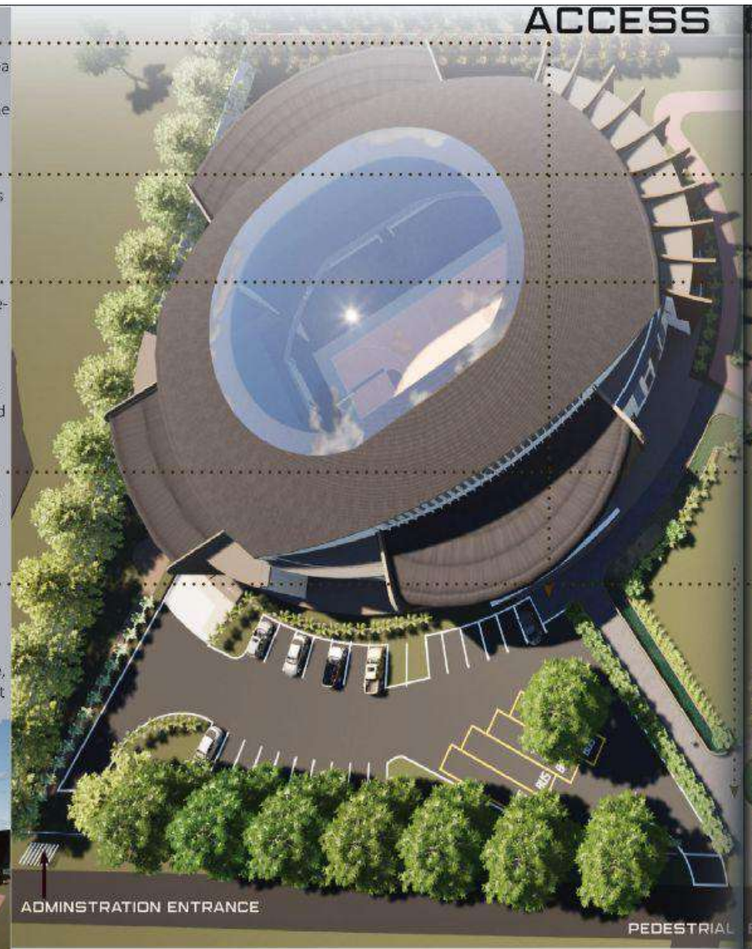
1. Main Arena Access:
Vehicular Access: The main arena has a dedicated parking area in front, accessible from the primary entrance road.
Pedestrian Access: Walkways lead from the parking area to the main entrances of the arena.

2. Indoor Games Building Access:
Pedestrian Pathways: Curved paths connect the indoor games building to the main arena and other facilities, allowing easy movement between areas.

3. Football Turf Pitch Access:
Primary Access: The football pitch has direct access via the pedestrian pathway from the arena and indoor games building.
Basement Parking: Located beneath the football pitch, the basement parking is accessible from a separate entry point, likely connected to the main road network. Stairs or elevators provide access from the basement parking directly to the field and spectator areas.

4. Outdoor Spaces and Community Park:
Pathways: The central community park and landscaped areas are connected by pedestrian walkways, providing easy access for visitors to relax or navigate between sports facilities.

5. General Circulation:
Overall Flow: The site is designed with clear, unobstructed pathways that connect all key facilities, ensuring efficient movement for both pedestrians and vehicles.
This layout ensures that all visitors can easily navigate the site, with clear routes for vehicles and pedestrians, and convenient access to all major facilities.



6. The badminton and lawn tennis courts, located at the top left of the master plan, are seamlessly accessible via a thoughtfully designed pathway that winds through the lush green landscape. This pathway is an extension of the main circulation route, ensuring easy navigation for visitors. The proximity of these courts to the indoor games facility further enhances convenience, providing athletes and spectators with fluid movement between different sports areas. The well-placed entry points and clear signage along the route guide users effortlessly to these courts, creating an inviting and intuitive approach to the sporting facilities.

7. Parking and Pedestrial access: Anticipated users are locals and students from St. Pauls University using public transport, thus higher priority is given to pedestrian access and circulation through the site.
Vehicular access is limited to the eastern boundary to reduce traffic congestion likely to be caused on Limuru Road.The main vehecular entry is placed deeper into the service road and leads directly into the two level basement which creatively utilizes the topographical level change for lighting and reducing excavation. The obtained flat level above is then used for the 7 aside turf .

Parking spots are a limited number with consideration for bicycle parking along the pedestrian walkway. Parking is lined with native landscaping to preserve biodiversity, provide shade, reduce soil erosion and facilitate infiltration of water into the soil. The layout of the site is aimed at providing an interactive experience withnature as one moves through the different spaces.

MATERIAL SELECTION

1. MAIN ARENA:
Exterior Cladding: Locally-sourced Maasai slate and Nairobi blue stone for the façade, which are materials that resonate with Kenyan architecture and are widely available.
Roofing: Thatched roofing is used for small sections of the arena's entrance and canopy areas. Hardened PTE isused in other parts.
Interior Finishes: Incorporates bamboo and hardwood i.e Mahogany or Mvule for internal paneling and seating. These materials are both sustainable and culturally significant in Kenya.

4. OUTDOOR SPACES AND COMMUNITY PARK:
Pathways: Paved with natural stone or laterite bricks that are commonly found in Kenya, providing a rustic and authentic feel.
Landscaping: Done with indigenous trees and plants such as acacias, baobabs, and flowering plants like hibiscus and bougainvillea, which are integral to the Kenyan landscape.
Decorative Elements: Metal sculptures and mosaic art that reflect Kenyan sports icons, wildlife, and cultural motifs are used to add a local flavor to the park area.

5. GENERAL CIRCULATION AREAS:
Lighting: Installed solar-powered lanterns with designs inspired by traditional African baskets and shields, emphasizes sustainability and cultural symbolism.
Signage: Wooden signs with engraved Swahili phrases and iconic Kenyan symbols are used to guide visitors, enhancing the cultural experience.

2. INDOOR GAMES BUILDING:
Wall Treatments: Earthy tones with textured finishes, incorporating partially rammed earth walls, which are not only environmentally friendly but also resonate with traditional Kenyan stone and mud architecture.
Flooring: Polished concrete with decorative inlays of African patterns or terrazzo flooring with locally sourced aggregates to represent Kenyan art and cultural symbols.
Cultural Art: The design integrates handwoven Kikuyu or Maasai textiles into wall hangings or seat upholstery to celebrate Kenya's rich cultural heritage.

3. FOOTBALL TURF PITCH:
Perimeter Fencing: Utilizes wooden slats or bamboo fencing for the spectator areas, giving a natural, eco-friendly look that reflects Kenya's connection to nature.
Seating Areas: Incorporates seating made from recycled plastics or wood, possibly sourced from sustainable Kenyan forests, which are both durable and environmentally conscious.

OVERALL DESIGN PHILOSOPHY:
Cultural Integration: The design seamlessly blends modern sports facilities with elements that reflect Kenyan identity, promoting both heritage and sportsmanship.
Sustainability: Materials are locally sourced where possible, supporting local industries and minimizing environmental impact.
Thematerials and design choices not only reflect Kenyan culture and sportsmanship but also creates a sense of pride and connection to the space for the Limuru people and Kenya at large.

MAIN ARENA

GROUND FLOOR
The main arena is designed to be a multifunctional space that efficiently accommodates various sporting events and large gatherings. The flooring within the central court is crafted from high-quality sports-grade maple wood, chosen for its durability, shock absorption, and smooth finish, which are ideal for basketball and other indoor sports. Surrounding areas, including the entry lobby and circulation corridors, are paved with polished terrazzo made from locally sourced aggregates, blending durability with a touch of Kenyan heritage.

Access to the arena is strategically planned with multiple entry points, including a main lobby, team entrances, and service access, ensuring smooth movement for spectators, athletes, and staff. The use of natural stone tiles at the entrance emphasizes a grand yet culturally resonant approach, reflecting Kenyan architectural traditions.

Plan efficiency is evident in the thoughtful arrangement of functional spaces. The placement of fitness rooms, snack shops, and souvenir stores around the perimeter ensures easy access without disrupting the flow within the arena. The integration of the press conference room, administration offices, and medical facilities enhances operational efficiency. The overall layout promotes optimal circulation, with clear pathways and unobstructed views, catering to both the local community's needs and international standards

ELEVATION DESIGNS
The circular plan of the arena provided a unique way of expressing the building form to achieve the purpose of the arena. Characterized by vertical elements and clean lines ,each elevation is designed to be unique and have a uniform design that is:

1. Aesthetically appealing. The elevations define the overall architectural style and visual character of the building. For this design, arches and vertical openings are dominan. The design is thoughtful and aimed at making the building visually striking and memorable.

2. Functional. Different elevations serve different functional purposes; Elevation 01 has the main entrance, elevation 02 is the teams entrance , elevation 03 has the VIP entrance and elevation 04 has the administration entrance. All the elavations have fire exit points strategically placed at the ends to facilitate fast evacuation of spectators after matches. The elevation design balances form and function to optimize building's operational efficiency.

ELEVATION 01

ELEVATION 02

ARENA

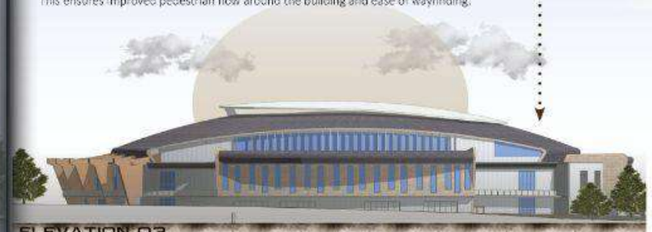
FIRST FLOOR
The floor is designed for optimal spectator experience and operational functionality. The seating area is arranged in a tiered configuration, ensuring clear sightlines for all attendees. The flooring material is a mix of hardwood and polished concrete; hardwood is used for the walkways and seating areas, providing a warm and comfortable feel, while polished concrete is used in high-traffic areas for durability and ease of maintenance.

The entry lobby on this floor offers easy access to seating sections, with wide corridors that help manage the flow of large crowds. The inclusion of VIP seating areas and press boxes reflects the arena's adaptability to host high-profile events. Additionally, the integration of snack shops and restrooms on this floor ensures convenience for spectators. The overall design considers both the aesthetic appeal and the practical needs of users, with materials and layout choices that resonate with the Kenyan context.

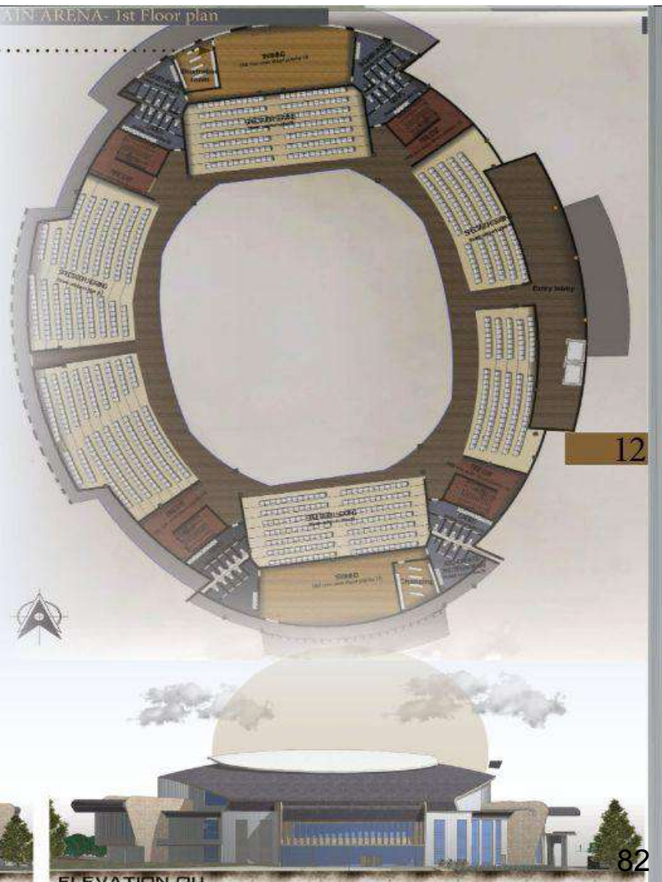
ELEVATION DESIGNS
3. Contextually integrated. The elevations consider the surrounding environment and neighbourhood context. Though the building is horizontal, it stands out in relation to Bustani Gardens due to its
contemporary elevation design.
4. Recognizable. The elevations play a key role to users in establishing the brand identity and creating a memorable first impression. The colours are inspired by the traditional Kikuyu colours and comprise earth tones that make it relatable to nature.

5. Sustainable in terms of passive strategies. The elevations incorporate passive design strategies including building form, strategic window placement and strategic material selection.

6. Easy to navigate. The elevations have a clear delineation of entrances and functional zones. This ensures improved pedestrian flow around the building and ease of wayfinding.



ELEVATION 03



ELEVATION 04

INDOOR GAMES

GROUND FLOOR

The indoor games facility emphasizes wellness and fitness, with key areas including a gymnasium, massage and sauna rooms, a judo space, and a wellness center. The flooring predominantly features rubberized sports flooring in the gymnasium and judo space for safety and performance, while the lobby and wellness areas use hardwood for a more inviting atmosphere. The layout promotes efficient circulation, with easy access to all amenities. The incorporation of natural materials and finishes reflects the local Kenyan context, creating a space that encourages physical activity while resonating with cultural values.

FIRST FLOOR

The first floor of the indoor games facility houses squash courts, table tennis areas, changing rooms, and washrooms. The flooring in the squash courts is made of high-quality hardwood, providing the necessary durability and traction. The table tennis area features rubberized flooring to enhance performance and safety. Changing rooms and washrooms are equipped with non-slip ceramic tiles for hygiene and safety. The layout is designed for smooth transitions between activities, with easy access to changing and washroom facilities. The use of local materials and thoughtful design enhances the facility's connection to Kenyan culture and promotes an active lifestyle.

ELEVATION DESIGNS

The elevations showcases a modern architectural design that effectively blends functionality with aesthetic appeal. The building's form is characterized by its dynamic rooflines, which slope at various angles, adding a sense of movement and energy to the structure. This is fitting for a sports facility, where dynamism and activity are key themes.

Material Use:

Glass Panels: Extensive use of glass in the facade allows for natural light to flood the interior spaces, reducing the need for artificial lighting and creating a vibrant atmosphere inside. The glass also creates a visual connection between the indoor and outdoor environments, emphasizing transparency and openness.

Stone Cladding: The use of stone cladding, likely from local Kenyan quarries, grounds the building in its Limuru reflecting the natural landscape and traditional Kenyan construction materials. This choice also contributes to the building's durability and low maintenance, suitable for the local climate.

Metal Panels: Metal is used in areas like the roofing and some sections of the facade, providing a sleek, modern finish that contrasts with the rustic texture of the stone. The metal may also offer protection against the elements and contribute to the overall sustainability of the building through its potential recyclability.

Concrete: The solid base and structural elements appear to be made of reinforced concrete, ensuring the building's stability and longevity. Concrete is a versatile material that can be molded into the complex shapes seen in the elevation, supporting both the structural and aesthetic ambitions of the design.

Wood Accents: Although less prominent, wood accents are used around windows or entryways to soften the facade and add warmth to the overall design. Wood introduces a tactile quality and a nod to traditional building practices.

SECOND FLOOR

This floor features spectator seating for squash matches, a screen games area, Zumba space, changing rooms, and washrooms. The spectator area is designed with comfortable seating and durable finishes, offering clear views of the squash courts. The Zumba and screen games areas have rubberized flooring, providing the flexibility and shock absorption needed for dynamic activities. Changing rooms and washrooms are fitted with anti-slip ceramic tiles, ensuring safety and cleanliness. The layout prioritizes ease of access and movement, reflecting Kenyan culture's emphasis on community, wellness, and enjoyment of sports.

THIRD FLOOR AND ROOF TERRACE

This level includes a double-height indoor badminton court with spectator seating, alongside changing rooms and washrooms. The court area uses high-performance wood flooring for optimal play, while seating is designed for comfort and visibility. The other part of the floor features an open-to-sky green terrace, providing ample seating for relaxation and outdoor chess games. This space is designed with locally sourced stone or tile flooring to reflect Kenyan aesthetics and culture. The terrace encourages a blend of physical activity and social interaction, offering a serene environment within the sports facility and a great view to the rolling hills and tea plantations.

ELEVATION DESIGNS

Achievements of the Elevation Design:

Integration with Context: The use of locally sourced stone and consideration of the Kenyan environment in material selection make the building a harmonious addition to its setting. This approach not only celebrates local culture but also enhances the sustainability of the project.

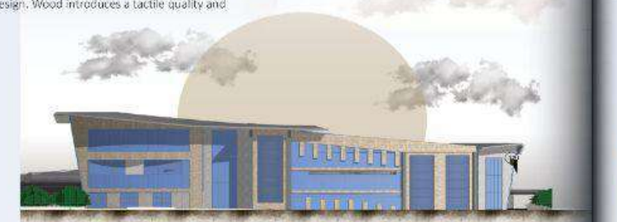
Dynamic Form: The varying rooflines and the interplay of different materials create a visually stimulating facade that reflects the vibrancy of the activities within. The form suggests movement and energy, appropriate for a sports facility.

Natural Light Optimization: Large glass panels maximize the penetration of natural light into the building, reducing energy consumption and creating a bright, welcoming environment. This design choice also allows for a visual connection with the outdoor landscape.

Sustainability: The combination of durable, low-maintenance materials like stone and metal, alongside energy-efficient glass, indicates a focus on sustainability. These materials are likely chosen for their longevity, recyclability, and minimal environmental impact.

Aesthetic Appeal and Modernity: The elevation successfully merges modern architectural trends with local materials and forms. The sleek glass and metal elements provide a contemporary look, while the stone cladding ensures the building remains rooted in its cultural and geographical context.

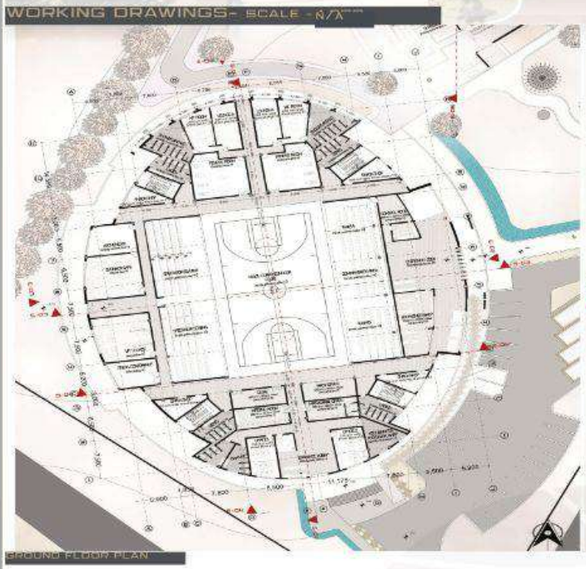
ELEVATION 01



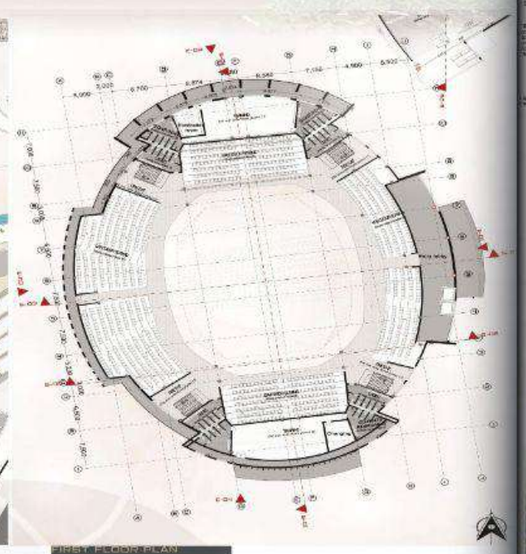
ELEVATION 02

DETAILED DESIGN

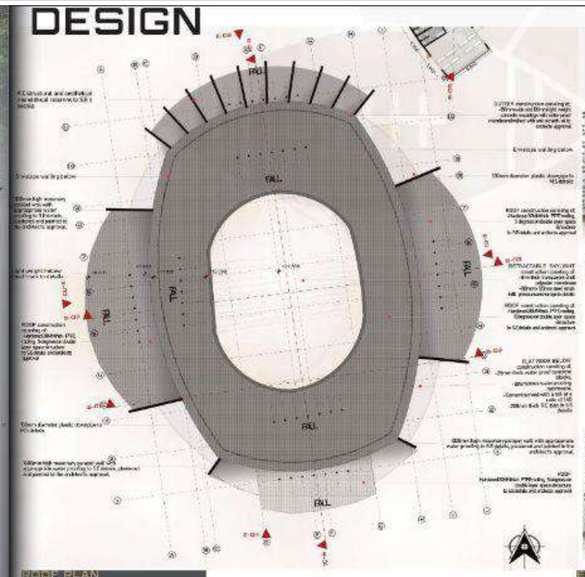
WORKING DRAWINGS- SCALE - N/A



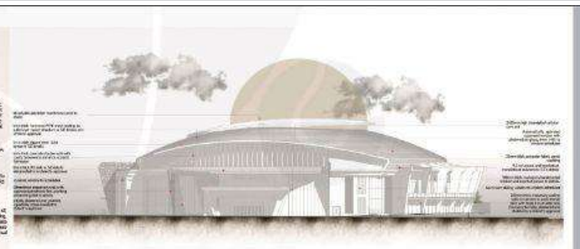
GROUND FLOOR PLAN



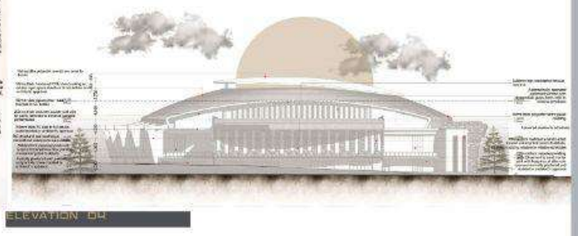
FIRST FLOOR PLAN



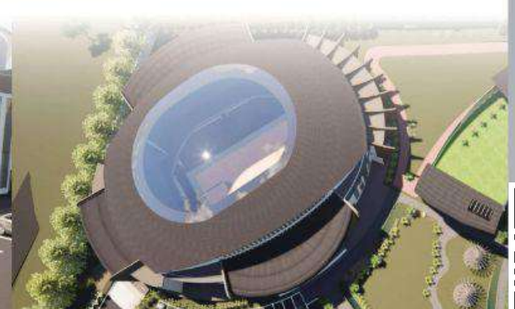
ROOF PLAN



ELEVATION 03



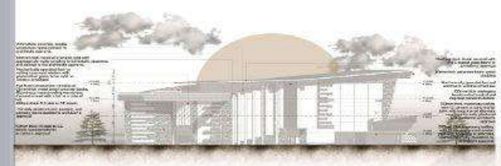
ELEVATION 04



WORKING DRAWINGS- SCALE - N/A

ELEVATION 01

ELEVATION 02



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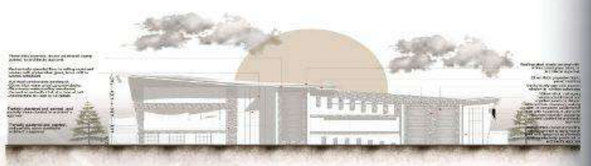

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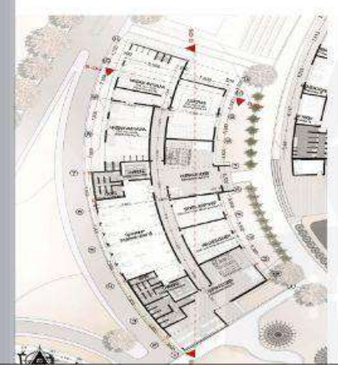
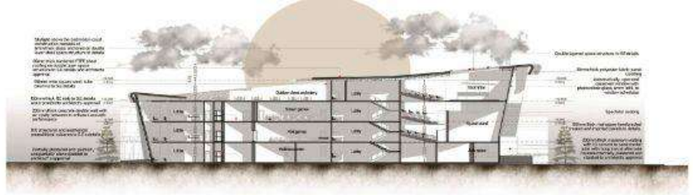
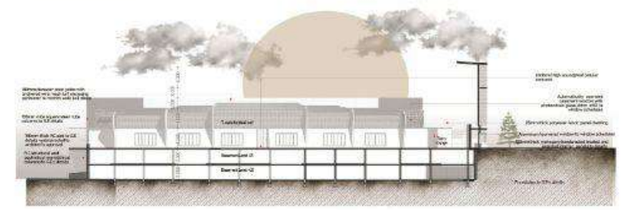


ROOF PLAN



SECTION 05

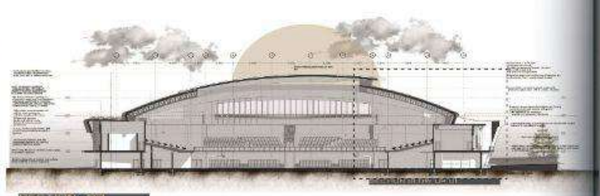


TURF SECTIONAL ELEVATION

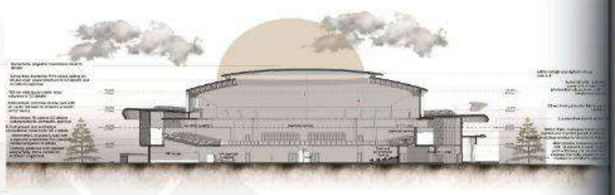
BUILDING SIDE VIEW

WORKING DRAWINGS- SCALE - N/A

SITE PLAN SCALE N/A

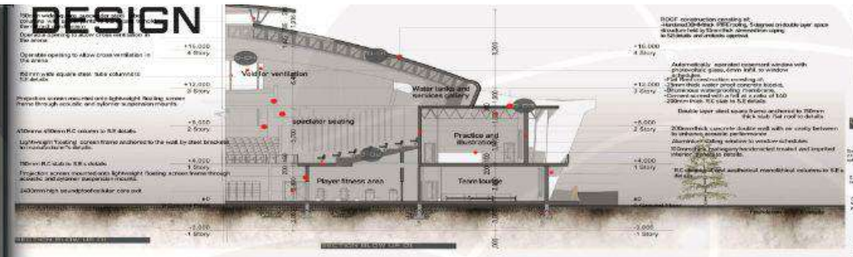


SECTION- 02



SECTION 01

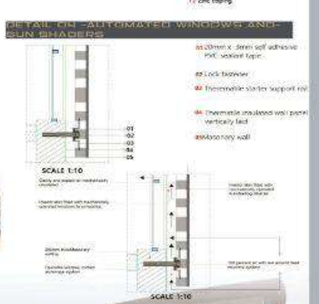
DETAIL 01- ROOFING



DETAIL 02- SPECTATOR SEATING

DETAIL 03- FLAT ROOF

01 Precast concrete blades
02 Extruded polythene membran
03 Insulation
04 Water proofing membrane
05 Levelling screed
06 Screed
07 150mm thick R.C slab
08 20mm thick plaster
09 Extruded polyfoma membrane insulation
10 Masonry wall
11 24mm thin plaster
12 Zinc coping



DETAIL 04 -AUTOMATED WINDOWS AND SUN SHADERS

01 20mm x 5mm self adhesive PVC weaker tape
02 Lock fastener
03 Thermostat starter support rod
04 Thermostat unsleaved wall panel vertically laid
05 Masonry wall

SCALE 1:10

SCALE 1:10

SUSTAINABILITY PLAN

Energy Efficiency:
Installing energy-efficient lighting systems, such as LED lights.
Use programmable thermostats to regulate heating and cooling systems.
Invest in renewable energy sources like solar panels to power the facility.
Implement energy-saving practices such as turning off equipment when not in use.

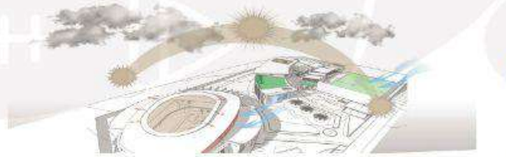
Water Conservation:
Using low-flow faucets, toilets, and showers to reduce water usage.
Harvest rainwater for irrigation and other non-potable uses.
Fix leaks promptly to prevent water wastage.
Educate staff and visitors about the importance of water conservation.

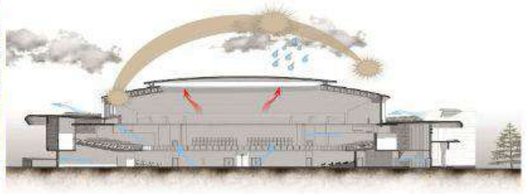
Waste Management:
Implement a comprehensive recycling program for paper, plastic, glass, and metal.
Compost organic waste generated from the facility's cafeteria or food vendors.
Encourage the use of reusable water bottles and containers.
Minimize single-use plastics by providing alternatives such as biodegradable or compostable products.

Green Transport
Promoting cycling to the sports center by providing bike racks and facilities for cyclists.
Offer incentives for carpooling or using public transportation.
Provide electric vehicle charging stations for staff and visitors.

Green Building Design:
Designing new facilities or retrofit existing ones to meet green building standards such as LEED certification.
Incorporate natural lighting and ventilation to reduce the need for artificial lighting and HVAC systems.
Use sustainable building materials such as recycled steel, bamboo, or reclaimed wood.

Education and Outreach:
Offering educational programs and workshops on sustainability topics for staff, members, and the community.





RACKET GAMES PAVILIONS

RACKET GAMES PAVILIONS

Teagoni Sports Complex

BY BRIAN KENGO

NAME: Brian Danda Kengo

INSTITUTION: Department Of Architecture & Interior Design(DAID)
Faculty Of Engineering and Architecture(SEA)
Kenyatta University(KU).

EMAIL ADDRESS: briankengo6@gmail,com

BIOGRAPHY:

Brian Kengo is a fourth-year student of Architecture at Kenyatta University who pursues architecture as a representation of its place, times and people. Kengo has interned with Locus Studio (design firm), and Ifata Engineering Services (contractors). In the design firm he mainly to contributed to designs, production drawings and rendering of residential projects. At Ifata, he oversaw construction activities at the Kwale Teachers College & Kinango Hospital ICU Building through site visits assisted by the site engineer. Brian also takes interest in photography, videography & film production, as part of his story telling theme in design.

KENYATTA UNIVERSITY-ARCHITECTURE AND INTERIOR DESIGN

(Front Cover Source: Shutterstock.com taken on 2017.Sep.5)

AFRICA

KENYA

KIAMBU

TIGONI

SITE

TIGONI,LIMURU

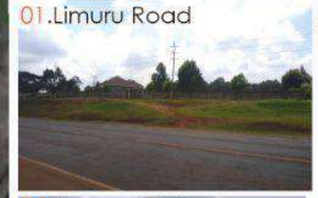
(Image source: Google maps,Satelite Image,2024)

SITE DESCRIPTION

General dimensions for the Tigoni site are approximately 100m for the width and 200m for the length.This makes the approximate area of the site as 20,000 sqm When converted this is around 4.94 acres

SITE images & Selection Justification

01.Limuru Road



- The site is located right alongside Limuru Road.and can therefore be **easily accessed** from The Road by both pedestrians & vehicles

02.Access Gate

- The **neighbouring plots** next to the site are **yet to be developed** thereby providing **lesser constraints** to work with during design. This however still means design should keep in mind possible future developments

03.Undeveloped plots

04.SITE

- The neighbourhood has a **serene atmosphere** ideal for recreation, which is what the design is also providing

(Images Source:Taken by Architecture students on Site Anlaysis visit,2024)

PROJECT SELECTION

Project involves the design of a **SPORTS COMPLEX** in **TIGONI**
The Sports complex is going to offer space for various sports such as **Basketball**, **Volleyball**, **Netball**, **Handball**, **Table tennis** and a whole variety of other **indoor games**

Other **supportive amenities** are also going to be provided to compliment the sporting activities. **Cafe/Restaurant** is to be provided alongside other amenities like **retail spaces**

The aim is to make the facility **usable by the community** as well& therefore provision of **public amenities** such as a **Gymnasium** & **meeting point** would be ideal

(Images Sources for Project Selection:Google.n.d)

JUSTIFICATION FOR SPORTS HUB DESIGN IN TIGONI

Bustani Gardens
(Images Source:Facebook.com, Bustani Garden Homepage)

Muthu Spa & Rsnt.
(Images Source:MGM Muthu Hotels.com ,n.d)

01.Presence of **complimentary functions around the site** .
The site is surrounded by a number of **recreational facilities** such as the **Bustani**, **Green View** and **Eva Gardens** as well as the **Muthu Spa and Restaurant**

Limuru Country Club
(Images Source:limurucountryclub.co.ke

02.**Business viability** of project as their is no any other sports complex within the neighbourhood. This therefore means **less competition for clientele.** The only sports facilities around include **Upendo Golf Course** & **Limuru Countryclub** which target a slightly different audience

(Images Source:Google.n.d)

03.Designing a sports hub in Tigoni is in line with the aim of **diversifying the access to Top sporting facilities in the country.** The sports complex will definately revolutionise the **perception** and potential of sports in Tigoni

PROJECT: DESIGN OF A SPORTS COMPLEX IN TIGONI,LIMURU

PROJECT DESCRIPTION

The Project involves the design of A **Proporsed Sports Complex.** The project's site is located in **Tigoni**, Limuru in Kiambu County.
The Sports Complex is to provide spaces for **different games, indoor & outdoor**. Other facilities to be include **retail & recreational spaces**

Tigoni Sports Complex

SITE DESCRIPTION

Site Location: Tigoni,Limuru in Kiambu County
Plot Area: 4.94 Acres
Plot Coverage: 50%
Ground Coverage: 9,507.5m2

CLIENT DESCRIPTION

Kiambu County Government:
The County Goverment aims for **economic development** and transformation through: promotion & **development of youth & sports** for a vibrant sportingindustry & empowered youth.
The department's vision is to lead in creative and innovative youth empowerment, **achieving sporting excellence** & embracing top of the range effective and efficient communication models.

Categories of Users:

- **Gender**

The design of the sports complex should be **inclusive for both genders**. Sports is no longer a one gender dominated field & that should be reflected on the design

- **Ability**

The design of the sports complex should be **inclusive for people with different disabilities**.Access , Circulation & Activity Spaces to be designed to accommodate these people as well

- **Age**

Children | Youth/ Teenagers | Adults | Old People

- **Specific Use**

Athletes | Spectators | Facility Staff | Businesses | VIP

- **Other Possible Future Uses**

Entertainment | Companies | Concerts | Residents | Community Gathering

SPORTS FACILITIES/ACTIVITIES TO BE PROVIDED

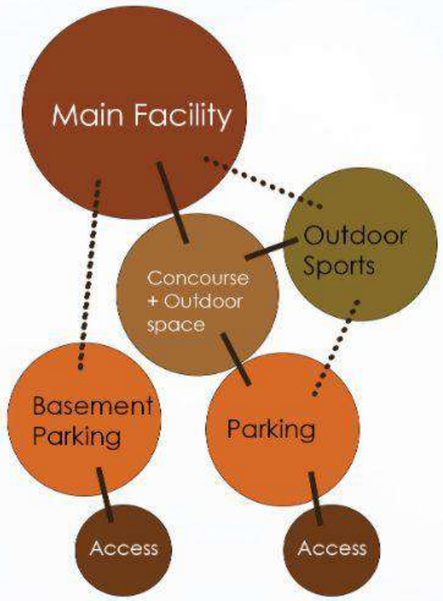
Basketball | Volleyball | Handball | Lawn Tennis | Badminton | Table Tennis | Darts | Martial Arts | Fitness | Aerobics | Skating | PoolTable

SCHEDULE OF ACCOMMODATION

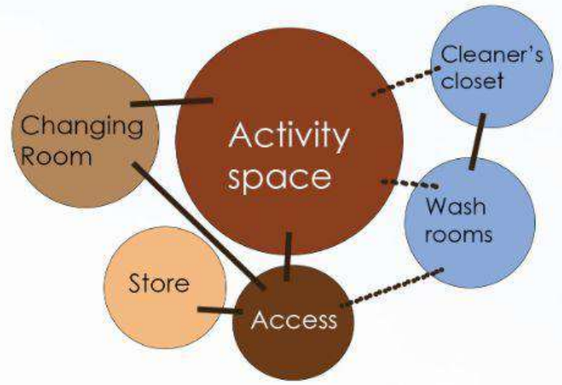
MAIN SPACE	SUB SPACES	SPARTIAL REQUIREMENTS	AREA
Administration Unit	Reception Waiting Lobby Work Station Break Room Administrative offices Meeting Room VIP Lounge Washrooms Cleaning Closets Changing Rooms	Reception desk,chairs,storage cabinets Waiting Lounge seats,Lounge table TV, Work station desks and chairs Refrigrator & microwave for break room Water and beverage station for break room Meeting Room Table,presentation screen Lockers WCs,Sinks	Approximately 200 sqm
Ticket Office	Ticket Station	Counter, Desk, Chair(s), Storage Cabinets	Approximately 50 sqm
Retail Unit **Restaurant** **Money Services/ATM/ M-Pesa**	Stores-Cold & Dry Prep Area Cooking Area Serving Area Washing Area Washroom Changing Room Waste Disposal Payment Counter	Payement counter desk,chairs,storage cabinets Counter tops, Cookers, exhausters Dishwasher Refrigrator & microwave Water stations, dust bins Lockers,WCs,Sinks	Approximately 350 sqm
Sporting gear Shop	Payment Counter Changing Room Store Display Section Shopping Section Washrooms Cleaning Closet	Payement counter desk,chairs,storage cabinets Display dummies Hangers WCs and sinks	Approximately 130 sqm
Activity Spaces	Multipurpose Court for basketball,volleyball & handball Indoor Spaces for Table tennis,badminton, fitness &martial arts Dressing/Changing Rooms for athletes Washrooms Recovery Spaces:Sauna/ minipool First Aid Spaces Spectator seating spaces Spectators Washrooms Food and Beverage Stations Store Rooms Cleaner's closets	Nets,Goalies,Tables for table tennis ,training equipment for gymnasium & boxing practice Tables for Pool,Darts boards,bowling alley Screens for EA/Digital sporting activities Lawns for lawn tennis Outdoor courts for outdoor basketball,netall & volleyball Lockers for changing rooms WCs and Sinks Seats for seating spaces Appropriate artificial Lighting for indoor games Public Adress systems/Installations Public Display systems i.e Screens	Each sporting activity has its own standard dimension requirements. These standards will be followed in design
Outdoor Spaces	Skating Park Volleyball/Multipurpose Courts Tennis Court Outdoor Seating Spaces	Street lights, trashbins Pavements/Pathways Outdoor Benches and Tables Signboards for wayfinding	Approximately 800 sqm Approximately 1000 sqm Approximately 1500 sqm Approx. 18 sqm each spot
Parking			

BUBBLE DIAGRAMS

SITE PLANNING



INDIVIDUAL SPORT ACTIVITY SPACE



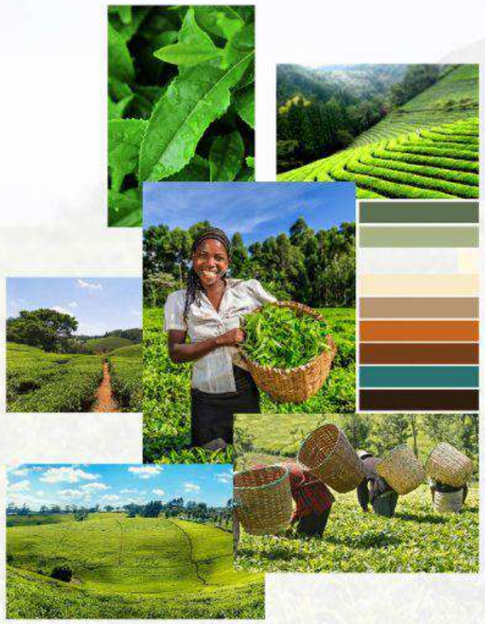
MAIN FACILITY SPACES

01.DESIGN PHILOSOPHY

"Architecture, should speak of its time and place, while yearning for timelessness"

- Architecture should be **Contextual**
- Architecture/Building Should be **relatable to the people in the place its located especially if is for public use**
- The Architecture should be **representative of the people's culture**(beliefs,activities, identity)
- **Form**/Architecture should be representative of **possiblities** interms of **invention**,**technology** and **engineering of that time**

02.MOODBOARD WITH ANALOGIES FROM SITE'S SURROUNDINGS



Identity

Tigoni is predominantly known for Tea Farming, which tends to give the place a green & Leafy Look

The place is also Hilly as well as Fogy,with a moody atmosphere in most times of the year

(Image Sources: Shutterstock.com,HapaKenya.com,Adobestock.com,n.d)

03.DESIGN CONCEPT & INSPIRATION FOR FORMS

- Sports is normally associated with virtues such as **Hardwork**,**Discipline**,**Relentlessness**,**Consistency**,**Wortk Ethic** Etc
- **The same** can be said about **Tea Farming**,It's a **long season of hardwork before actual results**(harvesting)
- The Tea Harvesting Basket is a significant symbol for alot of tea farmers/Harvesters
- For long term farmers/harvesters the tea basket has even sort of become part of them especially when working. Almost as second nature

- An OLD BASKET is therefore a true testament of all the hardwork put in by a farmer ,A virtue that sports & competition tend to reward
- An Old basket is therefore the main inspiration for the Sports Centre dominant form

(Image Source: Shutterstock.com,n.d)

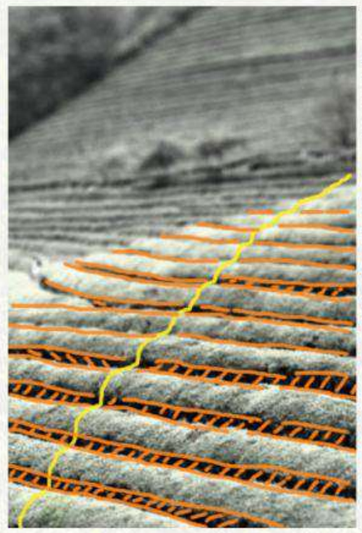
(Image Source: Shutterstock.com,n.d)

- Inspiration for forms is also gotten from the **Organic Shapes of nature around the site**
- The place is **hilly**, with the hills on the background creating sort of **curved lines** when juxtaposed against the sky

(Image Source: Shutterstock.com,n.d)

(Image Source: Shutterstock.com,n.d)

Organic leaf shape is to inspire design of **complimentary facilities** next to the Main Sports complex



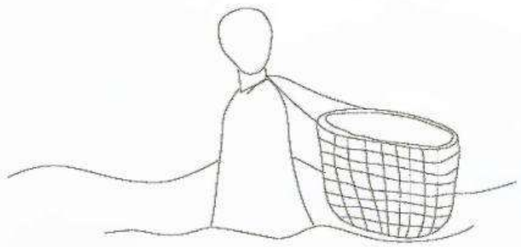
- **Tea plantations** have some sort of pattern with pathways alternating with Tea bushes, this can be an inspiration for designing of seating spaces

- **Nature of Surroundings** to be reflected on choice of construction materials: Meaning **incorporation of natural materials in design** as well as lots of **earth tones**

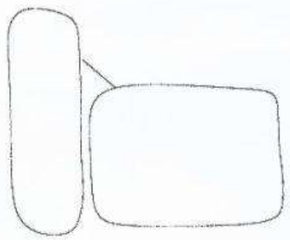
(Image Source: Shutterstock.com,HapaKenya.com,n.d)

04.FORM DEVELOPMENT

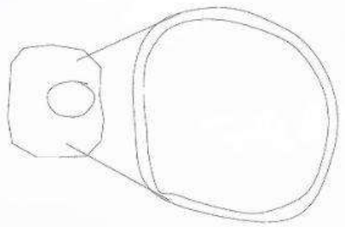
01.Inspiration of the buildings form is the form made by tea farmers during tea picking



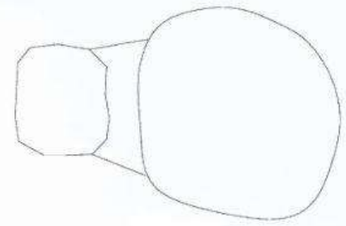
02.The image is made of a farmer,with a slender & taller proportion plus a basket with wider but shorter proportion, image simplified below



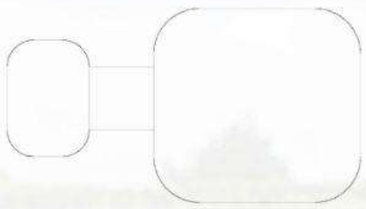
03.The image from above/a top view is as shown below



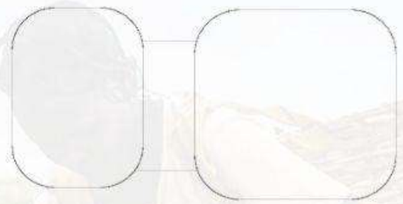
04.The shapes created by the farmer and basket can be simplified as below in plan view



05.From Organic Shapes to geometric shapes transforms image 4 to below

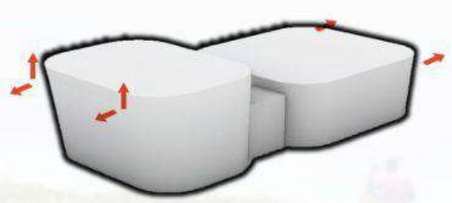


06.Increasing the size of the "farmer & ropes" representation to create a better composition

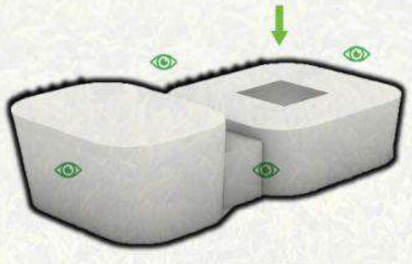


07.Extrude the 2D plane into 3D to create the image below

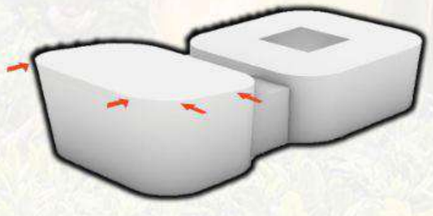
08.Increase height of the left part of 3D



09.Introduce Courtyard to the right side of 3D for lighting of interior spaces & creating spaces that have access to views

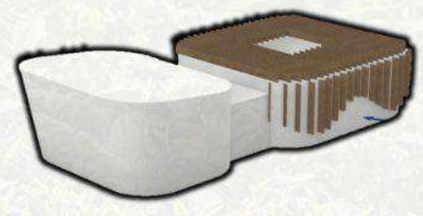


10.Introduce Courtyard to the right side of 3D for lighting of interior spaces



11.Sun shading the "Basket" Part of the design by Fins ,which also brings out the Basket character

12.Rolling hills inspiration to create a shaded walkway beneath the facade and define entry to building



Teagoni Sports Complex is a proporsed project in **Tigoni, Limuru, Kiambu County** .The proporsed project is meant to not only house /host a number of **both indoor & outdoor sports**, but is also expected to boost the **economy** of the Area, by **opening up the place** not only through sports but other **events** as well.

Its design is discussed in this presentation,. The design process was keen on not only **functionality** and user oriented but to also deliver **a sense of pride** and symbol that the **locals can identify with**

The Proporsed deisgn of the Sports Complex is broadly categorized into two:

Main Facility that houses a number of **indoor games** and other **support facilities**

Outdoor Sporting activities that have been designed for through **appropriate landscaping** of the **Projects Site**.

The Main facility is set to occuppy about **35% of the site** with the remaining **65%** being divided among the other activities going on outdoor. Ii.e:

Distinctive Building Form that mimics a farmer on a tea farm with a basket on the back paying homage to the the way of life in Tigoni.

Scale of the building makes it visible to people outside the site e.g passers by on Limuru Road, thereby making it a staple/landmark for Tigoni

Access Road to the Sports centre
Access Road provided on this side of site to spread vehicular traffic on busy days.Limuru Road is also busy and direct entrances from the Road wouldn't be ideal

3M High Boundary wall for the Sports Centre
Space definition from Surrounding Amenities/ Venues such as the Bustani Gardens.

Of course for security, access control & aesthetics as well

01.Proporsed Teagoni Sports Complex

• PROPORSED DESIGN,AXONOMETRIC DIAGRAM

Athletes Parking: Located at this part of the site as its immediately after the athletes entrance & right before athletes entrance into the indoor arena

01

02

Ramp to Basement Parking: Ramp to basement parking provided immediately after you entre through entrence three.This provides a direct and clear entrance/exit to basement

03

Volleyball: SA number of schools in & around Tigoni are known for being good in basketball so it was only right to design for volleyball.
The two courts are also multipurpose & can be used for badminton and handball

Skating Park: Skating park is located here as this was already the lower end of site, saving costs on excavation for the actual skating area
Skating is provided for paying homeage to artists in Tigoni evident from the site inventory
Skating is a sport hugely associated with artists

Entrance 1: Used by athletes, teams & coaching staff coming in for major events.Is the first entrance so as to provide the fastest and direct entry during matchdays

Spectators Stand: Spectators designed to offer shade to spectators , who are important in generating revenue for the sports centre. Orientation of the stand is so as to avoid the sun's glare on the spectators

Entrance 2: To be used by spectators & ahletes who're coming in by foot or cycling/ motorbikes.This is because the spectators entrance directly faces this entrance , bicyle and motorbikes parking is also right after this entrance

Entrance 3: To be used by spectators & working staff coming in by vehicles. Spectators coming in during busy days are expected to be alot. This entrance will help to spread out the traffic

Tennis Lawns: Proporsed to be designed for at this location as this was the site's lower end already and thus saving costs on excavation

Side by side courts are provided to accommodate at least two tennis matches at a ime , improving viiability of the project

Boundary Wall: 3M high Boundary wall proporsed to act as perimeter wall for security and access control to the outdoor sporting amenities.

The design for the boundary wall is to also for aesthetic purposes

01.**Bicycle & Motorcycle Parking:** Located at this part of the site as its immediately after the Pedestrians and cyclists access entry way to the site.

On grade parking is provided for cylists and motorbikes as it wouldn't be ideal to provide for this type of parking underground. Its important to avoid the collosion between cyclists/motorbikes with vehicles during busy days

02.**Staff & Short Comers Parking :** Located at this part of the site as its immediately after the Staff's entrance
On grade parking is provided for short comers who are shortly coming to run errands at the sports centre as it wouldn't be ideal to have them go all the way to the basement for parking

03.**Outdoor Seating Spaces :** Designed for at this zone so as to also provide views to the volleyball courts for people who intend to use the sports centre as a meeting point e.g friends who just want to hang out

PROJECT: DESIGN OF A SPORTS COMPLEX IN TIGONI,LIMURU

SITE PLAN

1. Athletes and coaching staff Acces,Vehicular
2. Pedestrian ,cyclists and motorbike users access
3. Vehicular Access, Staff and Spectators
4. Bicycle and Motorbikes Parking
5. Bus Parking for Players
6. Parking for players & Coaching staff/Media
7. Parking for Staff and Users staying for a short time
8. Ramp to Basement
9. Outdoor Seating Areas
10. Lawn Tennis court
11. Volley ball Courts
12. Skating Park
13. Seating Spaces
14. Main Facility

01. FRONT ELEVATION, FROM ACCESS ROAD

02. REAR ELEVATION

03. BACK ELEVATION FROM LOWER END OF SITE

04. ELEVATION FROM LIMURU ROAD

02.Proporsed Vehicular entrance for Spectators

Boundary Wall: 3. metres tall Boundary wall as a perimeter wallthat provides access control and security to the Sports centre premises

Earth Tone Design Colour Palette: The colour palette of the design is made up of earth tones making the designfit rightfully in its context, a predominantly green surrounding

Double lane entry way: All vehicular entrance are double lane .3.5 metresentrance lane and 3.5m exit lane. This allows for easy navigation into/out of the sports centre minimising any sort of congestion.

Unique Entrance Design: Entrances of the Sports centre are inspired by the tea leaf form ,following the design's concept of giving the Sports Centre a unique identity that Tigoni people can be proud of

03.Reserved Parking for Staff & Short Comers

Appropiate Landscaping: Trees planted around the parking lot not only for aesthetic purposes but also provide sunshade for the cars. Reduces costs of having to erect sun shades

Spacious concourse: is provided right before the spectaors entranceto allow for pre game activities e.g taking photos & informal buying and selling of things during matchdays

On grade Parking : On grade parking is provided for on site especially for short comers who would be staying shortly. 90 degrees parking is provided to allow for one directional entry & exit route for vehicles

Street Furniture : Street lights provided for to allow for users navigation at nightand also enhance security at the parking lot

03.Proporsed Vehicular entrance to Basement Parking

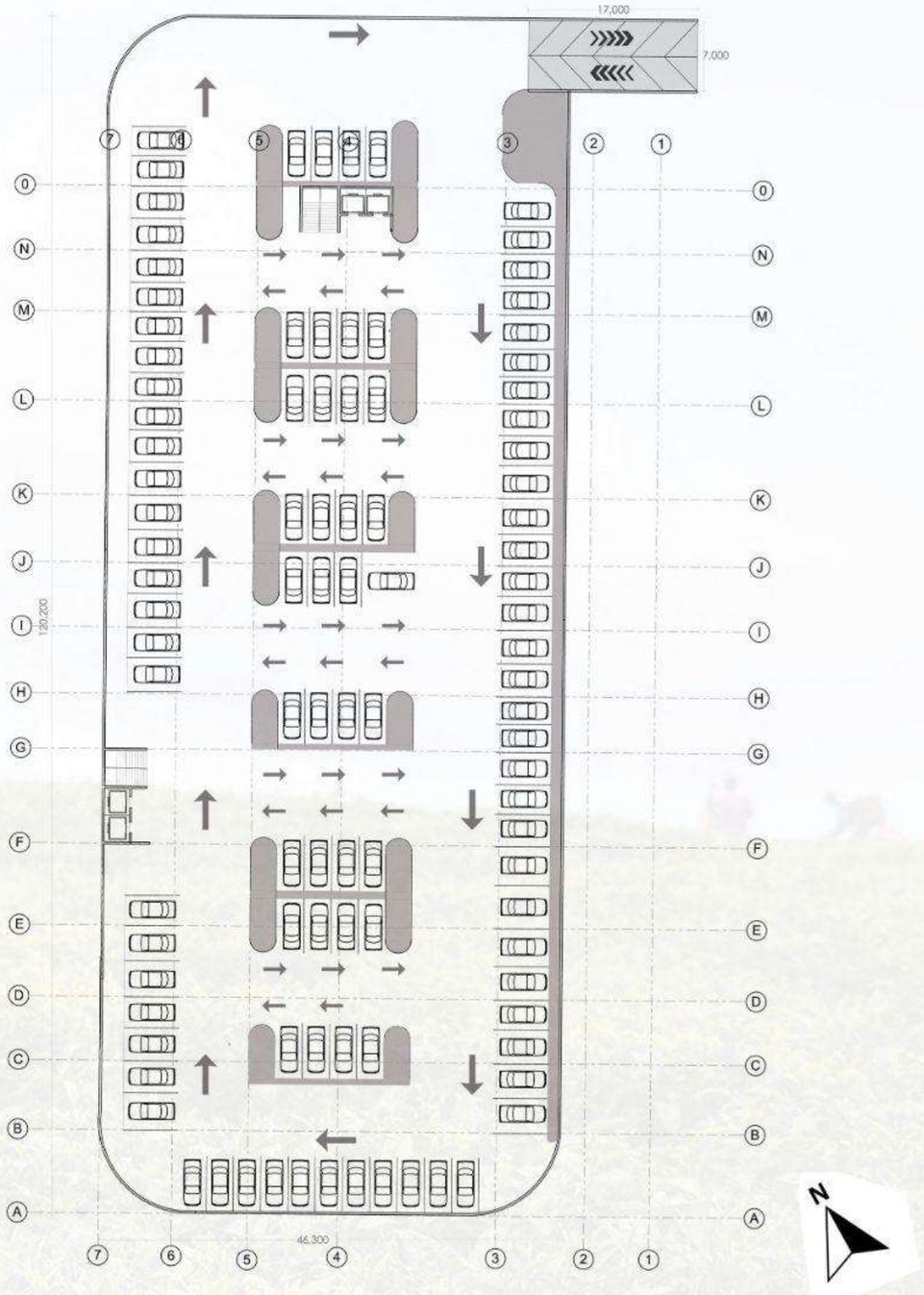
Outdoor Seating Areas: Outdoor seating areas at this point help one to overlook what is happening at the parking lot as well as have views to the tennis court

Gate House: Gate house to provide premises for security guards as they ensure acces control to the Sports Centre Guards at this specific gate house also control access to the on grade parking for short comers & staff

Protective wall: Ramp has a protective wall round it for the secutity of users walking above it on the sports centre

Ramp To Basement: directly faces spectators vehicular entrance making parking direct and fast easing up congestion on busy days 7 metres wide ramp to provide enough space for vehicles

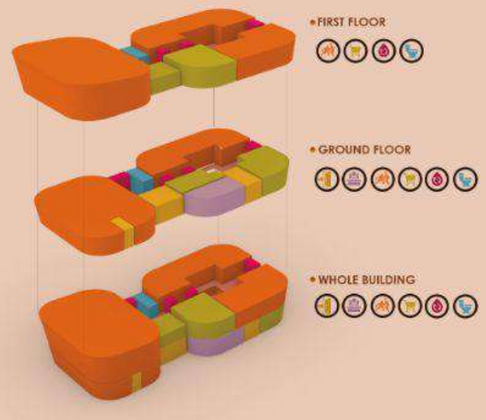
• BASEMENT PARKING FLOOR PRESENTATION PLAN



DESIGN PROGRAM

The Proporsed design of the Main Facility/Building's PROGRAM can be broadly categorized into the following:

- **Access/Entry Routes & Services**
- **Circulation-Vertical & Horizontal**
- **Sporting/Activity Spaces**
- **Retail Spaces**
- **Administration**
- **Public Wet Areas**



The **Sporting spaces occupy the largest area** of the building's program followed by **retail**, **entry routes** & **services**, **circulation**, **wet areas** then **administration**.

The building has **two levels**, the first is **5500 metres high** & houses **An indoor Arena**,**ticket station**, **food** and **beverage station**, **Administration**, **A shop** for sporting gear,a shop/outlet for **money services**,**a restaurant** , **a gym** & **aerobics space** & **washrooms**

The Second level houses **an indoor arena** as well , **a sports bar**,**food and beverage** station an **EA/Digital games space**, **Board games** space, **Darts** ,**Pooltable space** & **Foosball** Space and a **Multipurpose Arena** that houses both **Table Tennis** & **Martial Arts**

- **GROUND FLOOR**
- **Entry & Exit Routes**

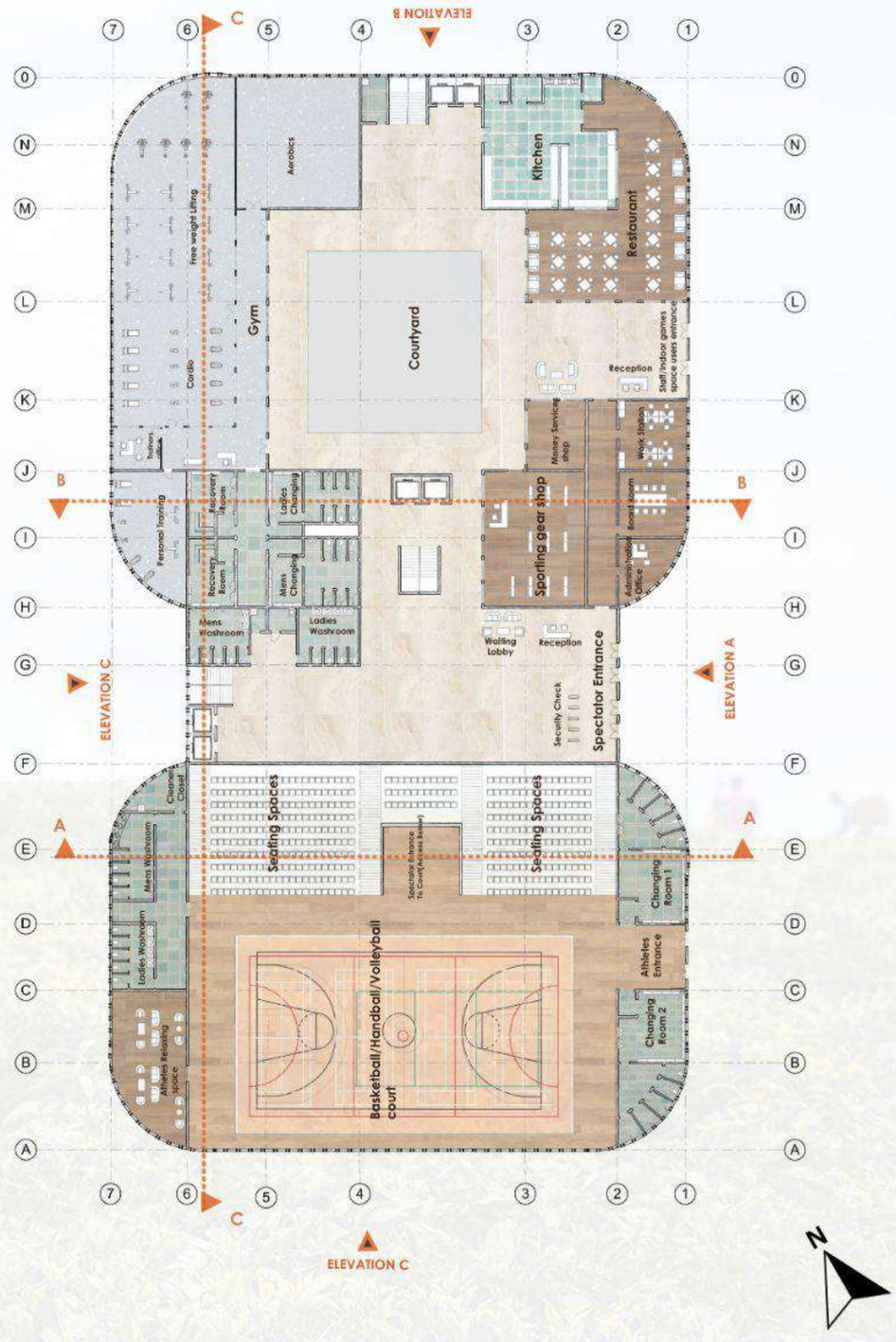
The Proporsed Building design provides three entrances

Entry one caters to **Athletes and Coching Staff**. During major events or competitionsin the indoor T-Arena, athletes & coaching staff coming into the **T-Arena** are to use this entry route.**Two changing Rooms** each with showers and toilets are provided right after this entrance .

Entry two caters to **spectators during matchdays or event days** coming to the facility . There is a **security checkstation** immediately when you get in through this entrance. **A reception desk** for inquiries is also available as well as a **waiting lobby**.**A ticket station** and **lost and found** section is also right opposite the reception desk . The entrance to the T-Arena is right after this Ticket Station.

Entry three caters to **staff working in the Main Facility** as well as **Users of the other indoor sports** in this part of the building i.e the **Gym/Table tennis or Martial Arts**. Entry is also to be used by People coming to say meet up at the **restaurant**. Entry provides a **reception desk** & **waiting lobby** right **opposite** the **restaurant**

- **GROUND FLOOR PRESENTATION PLAN**



01.Proporsed entrance to Indoor games section

Courtyard for daylighting of interior spaces & passive cooling

Restaurant is intentionally positioned opposite the waiting lobby so as to attract people into it

Reception & Waiting lobby as soon as you entre so as to get directions ASAP,for new comers & feel welcomed

Spacious entry way: Spacious entry way to the indoor games section so as to accommodate many people

Double ceiling height for thermal comfort & to provide a grandiose experience

02.Proporsed indoor Basketball/Multipurpose Arena

Wood Cladding on wall for acoustic purposes

Space structure sysyem for structural support,used so as to avoid use of columns on the court

Fire Rated Door for fire safety

Vinyl Floor for aesthetics & acoustic purposes

Wide Entrance to the court so as to accommodate many people at once

03.Proporsed indoor Gymnasium on Ground Floor

Wood Cladding on wall for acoustic purposes

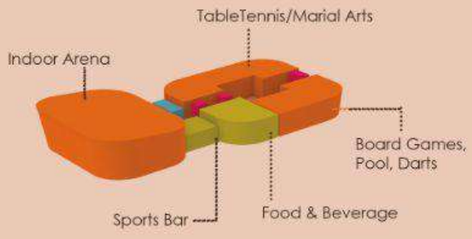
Large Windows with views towards the courtyard and for day lighting as well

Rubber Flooring Finish for acoustic purposes

Double ceiling height for thermal comfort to users of the space

FIRST FLOOR, BUILDING PROGRAM

Second level houses an **indoor arena** ,**sports bar**,**food & beverage station** a **Digital games** space, **Board games** space, **Darts** ,**Pooltable** & **Foosball** Space & a **Multipurpose Arena** that houses both **Table Tennis** & **Martial Arts.**



01.Table Tennis Space

Table tennis space is to accommodate **14 table tennis tables** as well as give room for **spectators** during **competitions**. A **store** is provided that stores **telescopic seats** for spectators. **ChangingRooms** & **pre game meeting rooms** are provided.This space can also be used for **Martial Arts** during **Non-Table tennis days**

02.Pool, Darts & Foosball

A space is also provided for **pool**,**darts** & **Foosball**. **Eight pool tables** , **Four Foosball tables** and **Four Darts stations**is a combination that can ergonomically work in this space

03.Board Games

A space for **chess and Checkers** lovers is also part of the project.
The space can comfortably accommodate upto **16 matches** at **a single time**

04.Indoor Arena

The indoor Arena is set to provide space for numerous activities mainly **Basketball**, **Volleyball** and **Handball** but can also accommodate other indoor sports such as **Badminton** and **Boxing matches**

A **Food/Beverage** station is also provided

01.Table tennis/Martial Arts Hall

Double Height ceiling for thermal comfort of large number of users expected to use the space

Large windows that allow for sunlight into the tennis hall for daylighting.This parts oversees the courtyard

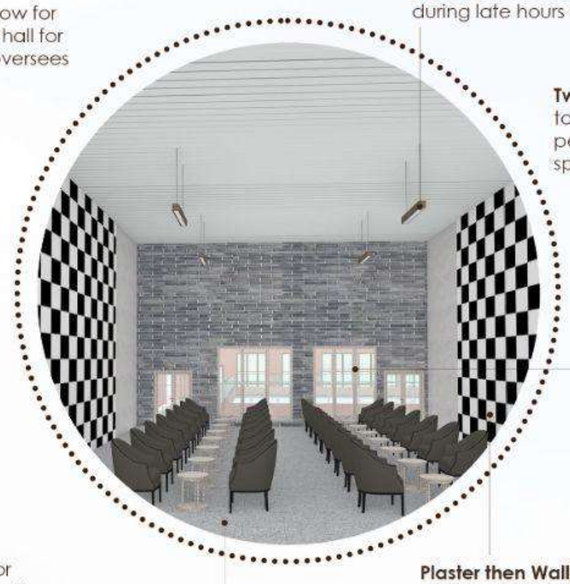
Rubber flooring: Rubber flooring for the indoor table tennis hall for acoustic purposes

Wood Cladding: Wood cladding for interior of table tennis hall for aesthetic purposes & acoustics

02.Board Games Space

Lighting fixtures for artificial lighting during late hours of the day

Two access doors to cater to the large number of people expected to use the space



Plaster then Wallpaper finish: for the board games room to make the room more fitiing to its intended purpose

Rubber flooring: Rubber flooring for the indoor table tennis hall for acoustic purposes

03.PoolTable,Darts &Foosball space

Two access doors to cater to the large number of people expected to use the space

Duoble Height ceiling for thermal comfort of large number of users expected to use the space

Darts Space

Pool table space

Foosball space

Wood Cladding: Wood cladding for interior of table tennis hall for aesthetic purposes & acoustics

Rubber flooring: Rubber flooring for the indoor table tennis hall for acoustic purposes

04.Sports Bar

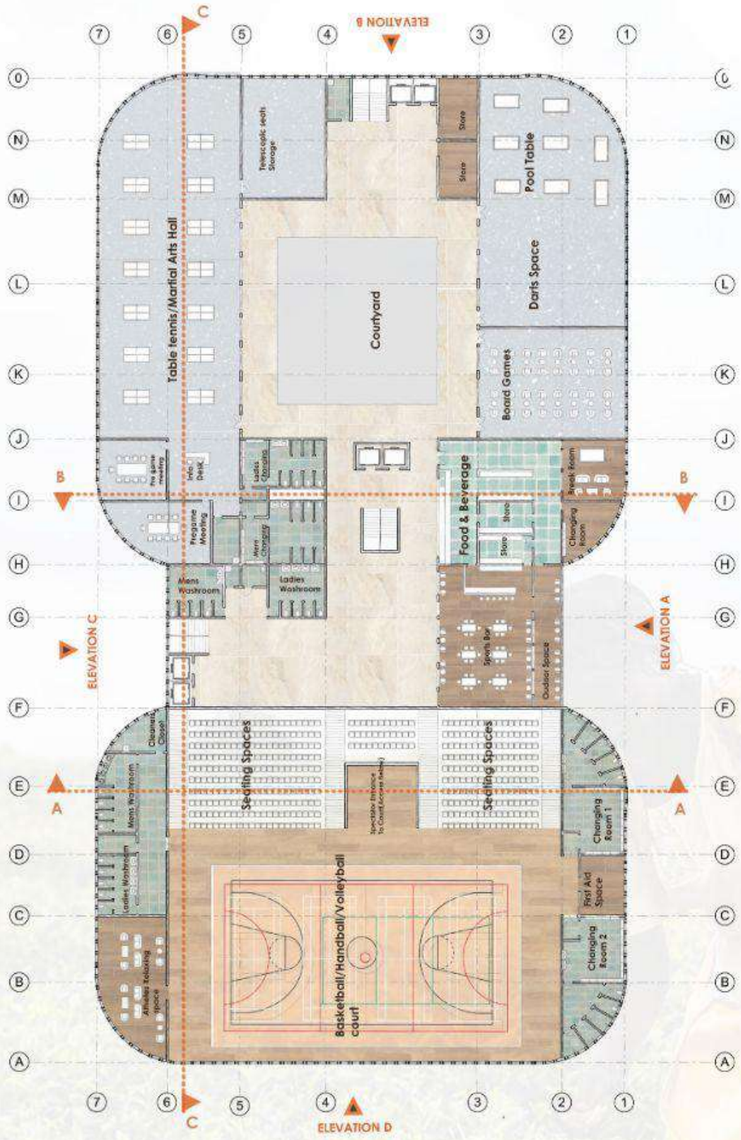
Access door to supportive spaces that serve the sports bar

Large windows that oversee spectators entrance from outside the facility. They also let in sunlight into the bar

Different seating arrangements provided to cater to different needs of the sports bar users

Vinyl flooring: Vinyl flooring finish for the Sports bar for aesthetics

• FIRST FLOOR PRESENTATION PLAN

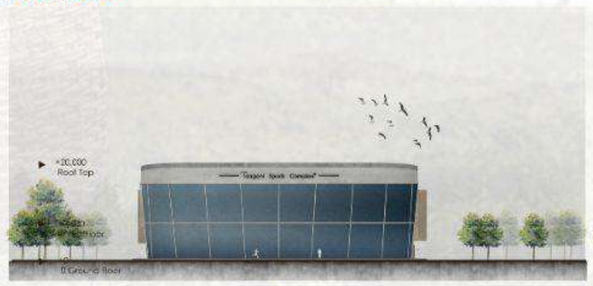


• PRESENTATION ELEVATIONS OF MAIN FACILITY

• ELEVATION A

• ELEVATION C

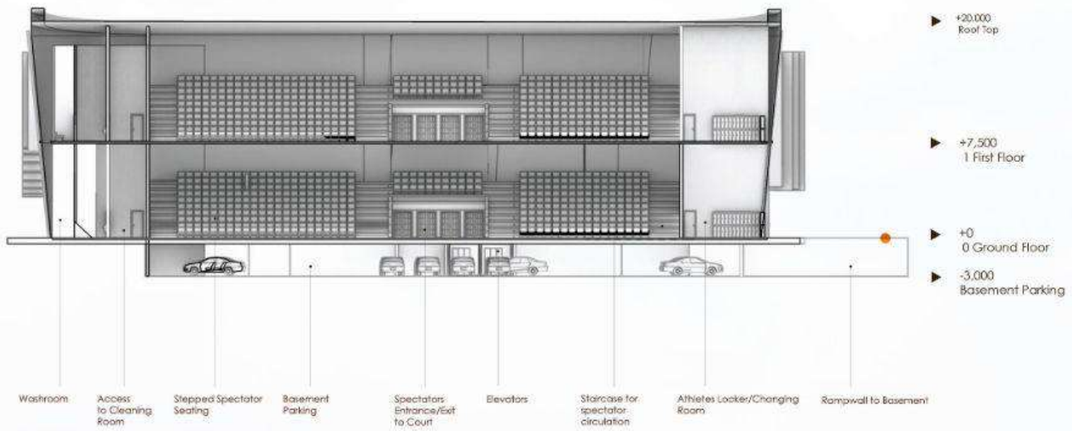
• ELEVATION D



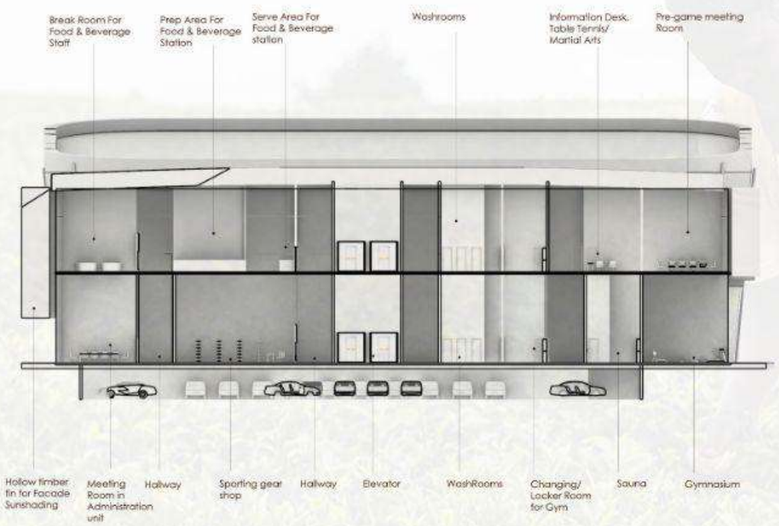
• ELEVATION B

• SECTIONS

• SECTION A-A SCALE 1: 200



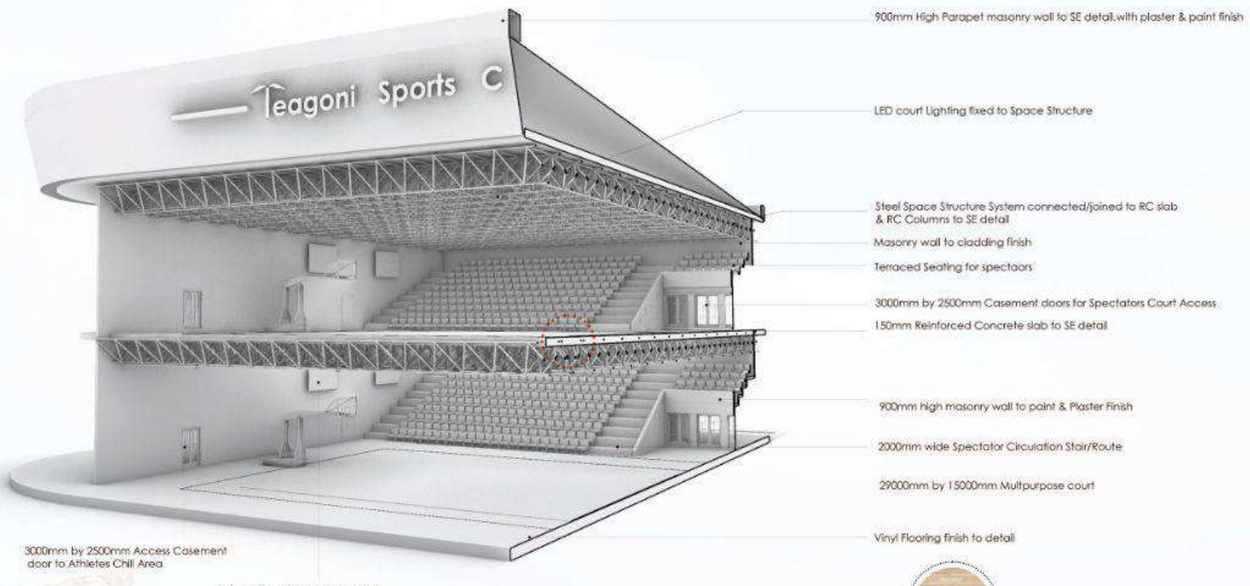
• SECTION B-B SCALE: 1: 200



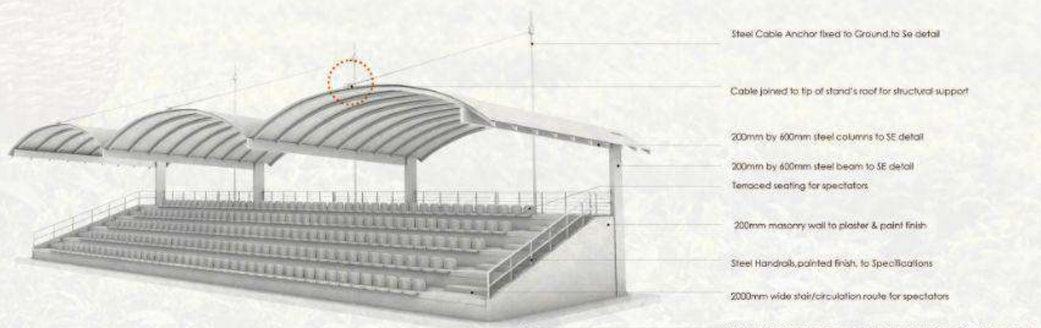
• DESIGN DETAILING

• MULTPURPOSE COURTS DETAILING

3D SECTION THROUGH MULTIPURPOSE INDOOR COURT SPECTATOR ENTRANCE



• SPECTATORS STAND DETAILING



• OUTDOOR DESIGN,LANDSCAPING & OUTDOOR SPORTS

The outdoor/landscape is composed of the following:

1. Parking
2. Access Roads to Parking Lots
3. Pedestrian Walkways Round the site
4. Signage & Wayfinding
5. Outdoor Seating Spaces
6. Greenscape/Vegetation
7. Outdoor Sports

View of Proporsed Teagoni Sports Complex, **Outdoor Sporting Amenities** ,All Outdoor sporting amenities are on the **rear end of the site**

01.Green scape /Vegetation

Trees Cover: Enough trees cover in the design proporsal to ensure a sustainable design that has little negative impacts on the environment

Grass Cover: Enough grass cover through out the design so as to maintain & abide by the ground coverage rules

02.Pedestrian Walkways

Plaster then Paint Finish to Spectators stands : Artisitc design of the paintings of the stand to pay homeage to the art in around Tigoni

Signange and wayfinding at the outdoor sports section to give direction on where to locate diferrent amenities for new comers

Permaeble pavers: Permeable pavers allow for water infiltration back to the ground, avoiding surface run off

03.Outdoor Seating

Perimeter Fence for tennis courts to preventany sort ofinteference from surrounding activities during match days

Protective wall: Protective wall that separates the entranceto the basement from the seating spaces

Outdoor Seating Area: for people who intend to use the Sports centre as a meting point.Also offers views to outddoor sports

04.Signage & Wayfinding

Signage & wayfinding: Signage and wayfinding installed close to spectatorss/pedestrians entrance & on grade parking to assist new comers

Unique design of Signage & wayfinding: Signage and wayfinding designed with inspiration from the tea leaf, being in line with the concept of identity

Street Furniture: Dustbins installed on the spectators/ pedestrians entrance to avoid any sort of littering

05.Bicycle Parking

Bicycle Parking Design: Bicycle & motorcycle parking is inspired by the tea leaf form

Bicycle Parking Location: Bicycle & motorcycle parking installed as soon as you get through the cyclists & pedestriansentrance & also encourage cycling to the facility(an environmentally friendly option of transit)

Appropiate Landscaping: The incorporation of grass lawns in the site help to contribute towards increasing the green cover

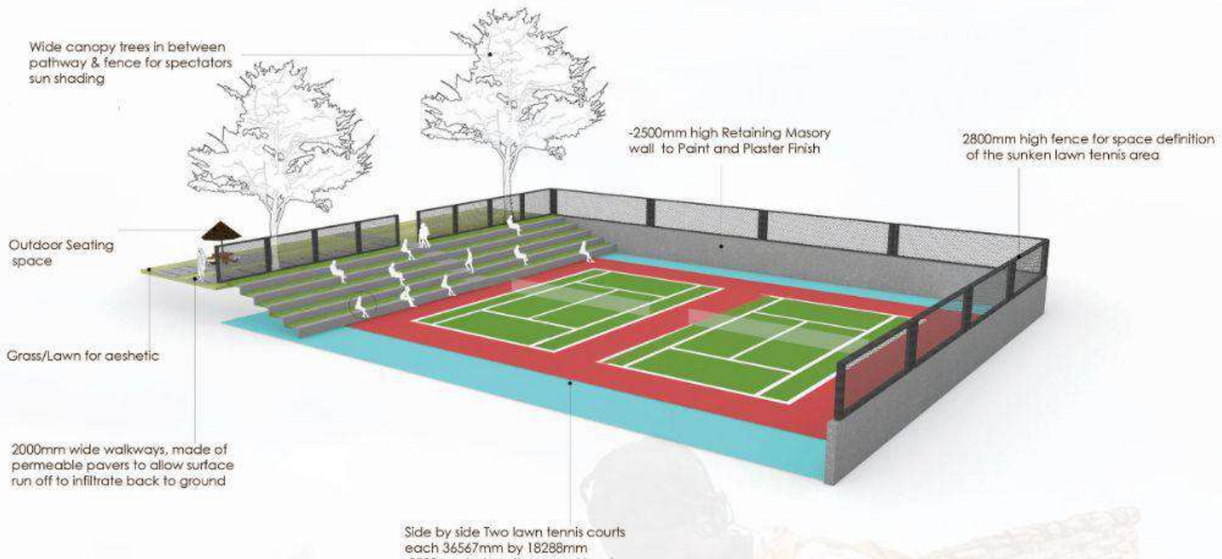
- **OUTDOOR SPORTS** offered at the Proporsed Teagoni Complex include:
  Volleyball Lawn Tennis &Skating

- **Tennis**
  TheTennis Section is **sunken** adapting to the **existing site topographic conditions.** The Tennis lawn also have a **landscaped seating** that is able to accommodateupto **200 spectators**

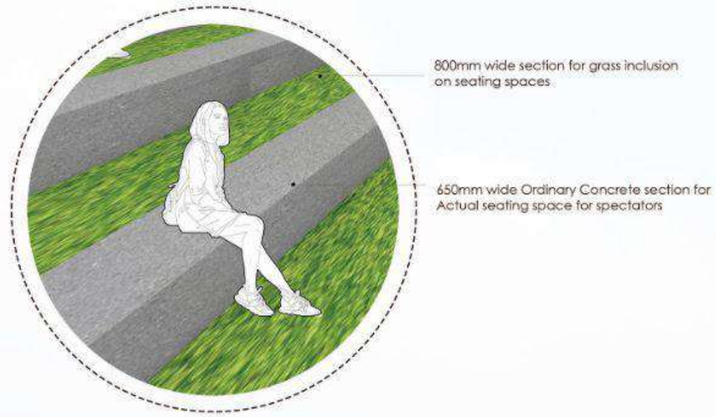
- **Volleyball**
  Proporsed Teagoni Sports Complex offers **Two outdoor Volleyball courts & . 'Green House Inspired" stand**

- **Skating**
  Art is a common theme around Tigoni and what other better sport that is **inline with Art than skating.** Proporsed Complex therefore offers **A skating park for kids,teens** and **even adults** plus a **spectator stand people**

Lawn Tennis,Landscape Diagram

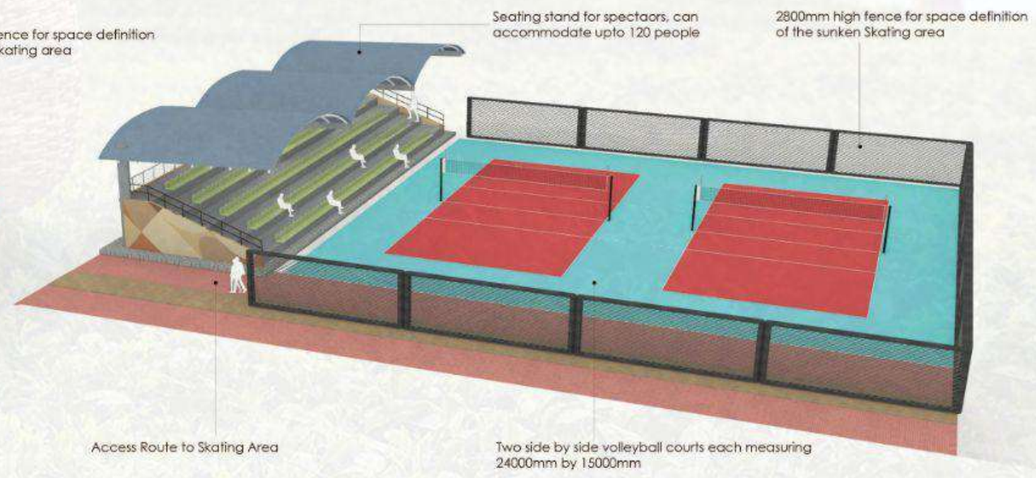


CLOSE UP OF SEATING SPACE,LAWN TENNIS



Skating Park,Landscape Diagram

Volleyball Space, Landscape Diagram



NAME: Ridhwan Sheikh, BAS IV.
INSTITUTION: Department of Architecture & Interior Design (DAID), Faculty of Engineering and Architecture (SEA), Kenyatta University (KU).
EMAIL ADDRESS: ridhwanabdirahman003@gmail.com

Ridhwan Sheikh is a Fourth-Year Kenyatta University architecture student graduating in 2026. Central to her design ethos is the belief that architecture should not impose upon nature but rather embrace and celebrate it. . Her work seeks to minimize ecological impact while crafting functional and aesthetically inviting spaces that merge seamlessly with their surroundings. Her recent project, Tigoni Sports Hill, reflects these ideals through its organic forms and sustainable practices.

With practical experience at Binaa Consultants and the Public Works Department, Garissa, she has contributed to projects such as a nursing school and a restaurant at Nairobi National Park. Ridhwan aspires to create a harmonious blend of nature and humanity in her designs.

SPORTS CENTER-TIGONI,LIMURU.

INTRODUCTION

THE PROPOSED SPORTS CENTER IN TIGONI, LIMURU, KIAMBU COUNTY, EMBODIES KENYA'S COMMITMENT TO SPORTS EXCELLENCE AND ATHLETIC DEVELOPMENT. LED BY THE KENYA SWIMMING FEDERATION AND THE NATIONAL OLYMPIC COMMITTEE OF KENYA, THIS PROJECT ASPIRES TO CREATE A CUTTING-EDGE FACILITY THAT WILL SERVE AS A HUB FOR AQUATIC SPORTS AND MULTIPLE ATHLETIC DISCIPLINES WITHIN THE REGION.

AT ITS CORE, THE PROJECT FEATURES AN AQUATIC SPORTS ARENA, DESIGNED TO MEET INTERNATIONAL STANDARDS AND CATER TO SWIMMERS AND WATER SPORTS ENTHUSIASTS. WITH STATE-OF-THE-ART FACILITIES AND INFRASTRUCTURE, THIS ARENA WILL NOT ONLY FACILITATE TRAINING AND COMPETITIONS BUT ALSO FOSTER TALENT DEVELOPMENT, ENSURING KENYA'S PROMINENCE IN AQUATIC SPORTS ON THE GLOBAL STAGE.

COMPLEMENTING THE AQUATIC SPORTS ARENA IS A MULTIFUNCTIONAL STADIUM, DESIGNED TO ACCOMMODATE A VARIETY OF SPORTS SUCH AS HANDBALL, VOLLEYBALL, BADMINTON, AND TENNIS. THIS VERSATILE SPACE WILL SERVE AS A CENTRAL HUB FOR ATHLETES FROM DIFFERENT DISCIPLINES, PROVIDING THEM WITH A WORLD-CLASS ENVIRONMENT TO ENHANCE THEIR SKILLS AND SHOWCASE THEIR TALENTS.

BRIEF ANALYSIS.

TIGONI SPORTS HILL

SITE LOCATION

SITE: TIGONI, LIMURU
CONSTITUENCY :LIMURU
COUNTY: KIAMBU
COUNTRY: KENYA

LIMURU COUNTY, LOCATED IN THE PICTURESQUE LANDSCAPES OF KENYA, IS SET TO WITNESS THE ESTABLISHMENT OF A STATE-OF-THE-ART SPORTS FACILITY CATERING PRIMARILY TO **AQUATIC SPORTS**, **COMPLEMENTED BY A RANGE OF INDOOR SPORTS**. THIS INITIATIVE AIMS TO PROVIDE A HUB FOR SPORTS ENTHUSIASTS, FOSTERING COMMUNITY ENGAGEMENT, HEALTH, AND WELL-BEING. THE TIGONI SPORTS HILL ASPIRES TO BE A CENTER OF EXCELLENCE, PROMOTING BOTH RECREATIONAL AND COMPETITIVE SPORTS ACTIVITIES.

CLIENT

KENYA SWIMMING FEDERATION
NATIONAL OLYMPICS COMMITTEE

TARGET AUDIENCE

SCHOOLS

LOCAL SCHOOLS AND COLLEGES FOR AQUATIC SPORTS TRAINING PROGRAMS.

SPORTS CLUBS AND ORGANIZATIONS FOR HOSTING COMPETITIONS AND EVENTS.

GENERAL PUBLIC

GENERAL PUBLIC FOR FITNESS AND RECREATIONAL INDOOR SPORTS ACTIVITIES.

TOURISTS

TOURISTS SEEKING SPORTS FACILITIES DURING THEIR STAY IN LIMURU COUNTY.

SCHEDULE OF ACCOMODATION

SPACE	CAPACITY
MAIN POOL	50M X 25M (10 LANES)
DIVING POOL	LENGTH OF 25M (VARIABLE WIDTH DEPENDENT ON NO OF DIVERS,2.5 EACH)
INDOOR SPORT(BADMINTON)	13.4 M X 5.18M for Singles
INDOOR SPORT(BASKETBALL)	28.65 M X 15.24 M
INDOOR SPORT (VOLLEYBALL)	18M X 9M
PARKING	60M X 32M (Approx. 80 PARKING SPOTS)

PROJECT SCOPE

1.DEVELOPMENT OF A WORLD-CLASS AQUATIC FACILITY EQUIPPED WITH OLYMPIC-STANDARD SWIMMING POOLS, DIVING BOARDS, AND WATER SPORTS AMENITIES.
2.CONSTRUCTION OF INDOOR SPORTS ARENAS FOR ACTIVITIES SUCH AS BASKETBALL, VOLLEYBALL, BADMINTON, AND INDOOR TRACK EVENTS.
3.SUPPORTING INFRASTRUCTURE, INCLUDING CHANGING ROOMS, FITNESS CENTERS, ADMINISTRATIVE OFFICES, AND SPECTATOR SEATING.

PROJECT GOALS

1.HOST REGIONAL AND NATIONAL TOURNAMENTS
2. OVERALL HEALTH AND WELL-BEING OF THE COMMUNITY
3.ENCOURAGE COMMUNITY PARTICIPATION IN INDOOR SPORTS
4.FUNCTIONALITY
5.SUSTAINABLE DESIGN
6.REMIUM FACILITY FOR AQUATIC SPORTS TRAINING

PROVIDED FACILITIES

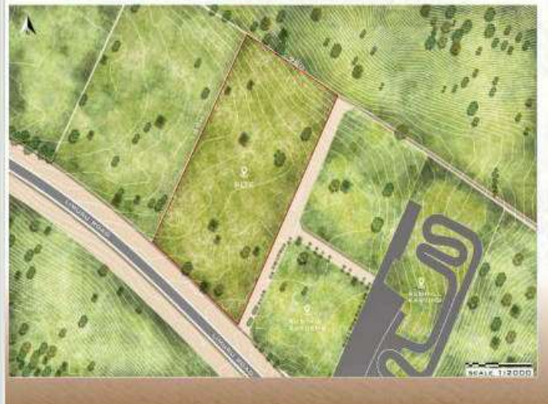
1.INDOOR AQUATIC CENTER
2.INDOOR SPORTS FACILITY
3.PARKING
4.FITNESS CENTER
5.ADMINISTRATIVE OFFICES
6. CAFE AREAS
7.SPECTATOR SEATING
8.OUTDOOR SPORTS FIELDS

MAIN SPORTS

SWIMMING TENNIS VOLLEYBALL BADMINTON BASKETBALL

SITE SELECTION

EXISTING SITE MAP



JUSTIFICATION

1.TIGONI OFFERS A SERENE ESCAPE FROM URBAN CHAOS

2.IT IS A PRIME DESTINATION FOR SPORTING EVENTS AND COMPETITIONS.

3.PROVIDE ATHLETES WITH AN IDEAL ENVIRONMENT TO DEVOTE THEMSELVES TO TRAINING AND PERFORMANCE

DETAILS

AREA

98M X 189MX 200

SIZE

20,000 SQM = 4.95 ACRES

SITE REGULATIONS

PLOT COVERAGE = 50%
PLOT RATIO = 400%

SLOPE

GENTLE SLOPE

CASE STUDY-- THE SINGAPORE SPORTS HUB

LOCATION AND BACKGROUND INFORMATION

The Singapore Sports Hub is situated on a 35-hectare site in the heart of Singapore, adjacent to the Kallang Basin.

The project proposal was based on a report by the Committee of Sporting Singapore calling for the city-state to promote a culture of sports, and replace the aging National Stadium.

It comprises of a 55,000 seat stadium, an aquatic centre (the OCBC Aquatic Centre), a multi-purpose indoor arena (the OCBC Arena), and a variety of retail and commercial developments

The whole precinct is unified by a consistent philosophy and design approach to landscape, shade and shelter and lighting, providing levels of comfort and quality of experience appropriate to Singapore's tropical climate and public expectations.

PROGRAMME OF ACTIVITIES

55,000-cap.National Stadium with a retractable roof & movable seating

Community facilities i,e basketball, netball volleyball courts plus running & cycling paths

Singapore Indoor Stadium, an existing 12,000-seat indoor arena

OCBC Aquatic Centre with 3,000 permanent seats, expandable to 6,000

Community facilities i,e basketball, netball volleyball courts plus running & cycling paths

A Sports Museum, Library, Shimano Cycling World & Kallang Wave Mall

OCBC Arena, an indoor sports facility.

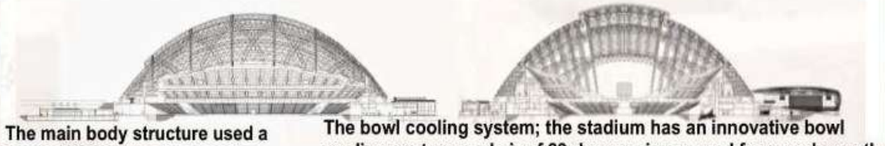
The Water Sports Centre, a kayaking and canoeing facility

CONCEPT AND IDEAS

Designed with sustainability and legacy in mind, Singapore Sports Hub provides rich and meaningful experiences to inspire athletes, visitors and local community for generations to come.

Photovoltaic panels furnish an approximate 4,500 square meters of the National Stadium's exterior. They harness solar energy, whi ch helps reduce the Singapore Sports Hub's energy consumption.

STRUCTURE AND MATERIALS



The main body structure used a conventional structural system, in the form of concrete construction to effectively hold tribune loads.

The bowl cooling system; the stadium has an innovative bowl cooling system,cool air of 23 degrees is pumped from underneath all seats, using less than 15% of the energy required for similar conventional air-conditioned stadiums.It is also partially powered by solar pannels making it even more eco-friendly

SITE ANALYSIS

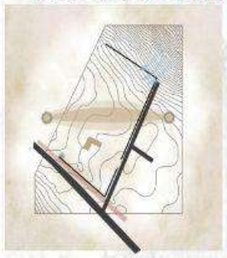
LOCATION AND BACKGROUND

The site is situated on Limuru Road and can be reached from Nairobi via Ruaka and Ndenderu (37 minutes) or Limuru via Kabuku (18 minutes).

The site, resembling a parallelogram, has a width and length of 100m and 200m respectively, resulting in an area of 20,000 sqm, which is 4.94 acres.

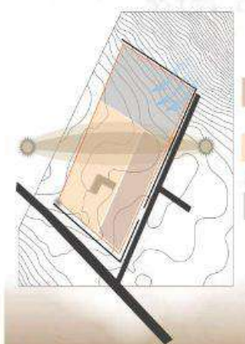
- Tigoni is historically known for having a lot of tea plantations.
- As such the area is generally green and very serene as it has a sparse population.
- The area generally has stand alone residential houses and greenhouses for farming purposes.

EXISTING SITE CONDITIONS



Services(Water, power, internet)

Wind



ZONE A ; Adjacent to roads and is fairly flat , suitable for entries and parking

ZONE B; Fairly flat and hence suitable for the building positioning

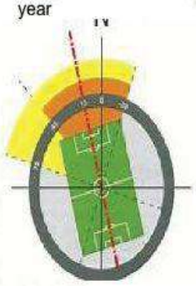
ZONE C; steeper side of the site , suitable for elevated structures and basement parking

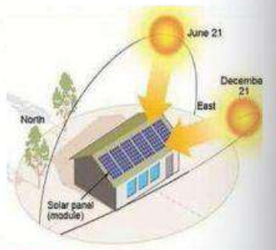
CLIMATE

Limuru is relatively has temp lows of 16 and is of 28 and is relatively cold and foggy most times of the year

Building orientation should maximize solar gains

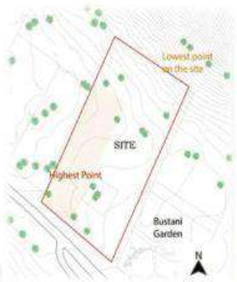
The fields should be oriented to north to allow for playability

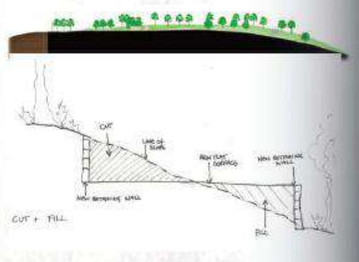




TOPOGRAPHY

The site is generally flat from the southern end but it starts to slope from the middle towards the northern end where it is lowest





Drainage to the lowest point i.e. north of the site.
Location of the septic and soak pit should also be at the lowest point of the site.
Parking should be located at the generally flat part of the site.

Grade the basement parking and elevated outdoor sports area

VEGETATION

The existing vegetation on site mainly consists of weeds,banana plants, small trees,spinach,kales and shrubs

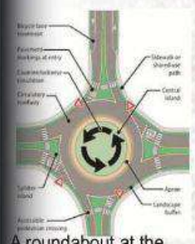
the proposal is to eliminate the unwanted shrubs then do proper landscaping with vegetation that is resistent to the cold climatic conditions for example kikuyu grass

SITE ANALYSIS

ACCESS AND CIRCULATION

From Limuru town
↓
Limuru bridge
↓
Muniu family Kamandura
↓
Junction
↓
Site

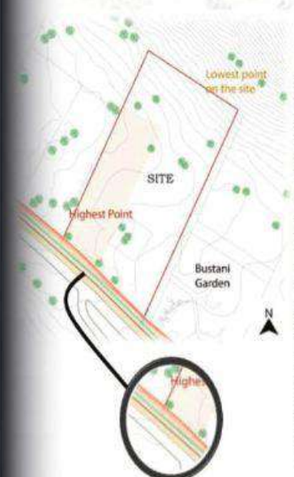
From Kiambu Town
↓
Kanunga Village
↓
Raini shopping center
↓
Banana Market
↓
Ndenderu Junction
↓
Site



A roundabout at the junction to eliminate traffic jams

Wide con course and circulation pats

UTILITIES



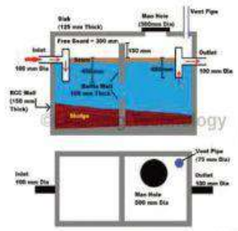
The existing site is supplied with utilities such as
1. Electricity
2. Water
3. Internet Connectivity
4.Storm water drainage

-It however lacks proper drainage in the form of sewer lines
-An internet service provider will be required to provide adequate coverage when the site will be put into use
-The storm water drainage channel is narrow and might be prone to overload especially in the heavy rain season. A recommendation would be to widen it

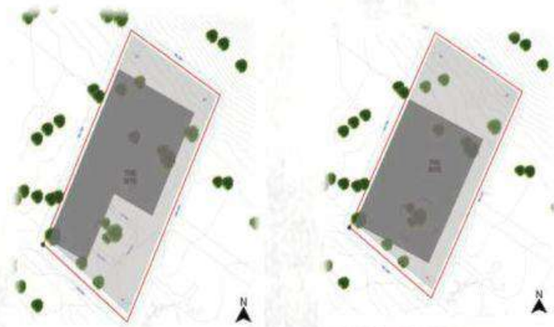
UTILITIES - RECOMMENDATION

The area is zoned as a residential zone due to its low population and therefore lacks an established sewer collection system.

A well placed septic to help in disposal of waste water on site project.
Standard Septic use for commercial areas is 100 litres per person.



ZONING REGULATIONS



Way Leave- (utility lines)- 3m or more in width
Building line/setback- 6mfrom a 9m wide road; 3m from side and rear of the plot.
Plot coverage(max allowed)= 50%
Plot ratio= 250% for residential zones, 400% for commercial zones

Plot ratio = 250%
Gross site area=19,015m^2
Ground coverage= 50%=50/100 X 19,015m^2=9,507.5m^2
Max built area= 19,015m^{2}X250%= 47,537.5m^2
Max floors of uniform area 9,507.5m^2= 5 floors

Juja, Kikuyu and Limuru have typical trends in their towns. The following table is based on Kiambu-Kikuyu Sub-county Planning requirements:

Building type	Min. plot size (Ha)	Max ground coverage (%)	Plot ratio	Maximum no. of floors allowed
Integrated office complex	20	25	1:1.5	4-8
Integrated sports centre - City Level	30	10	1:0.2	2 (Ground plus one)
Integrated sports centre - Sector Level	10	10	1:0.2	2 (Ground plus one)
Sector playground	5	1.0	1:1.01	1(Ground)
Stadium	5	10	1:0.2	2(Ground plus one)

In the absence of adequate provisions to meet certain demand for space for a particular activity, the available built-up space shall be used (for other than normally permitted use) due to the demand and better economic return- This applies to mixed-use developments combining residential, commercial, cultural, institutional or entertainment purposes

CONCEPT DEVELOPMENT

"THE SPORTS HILL"

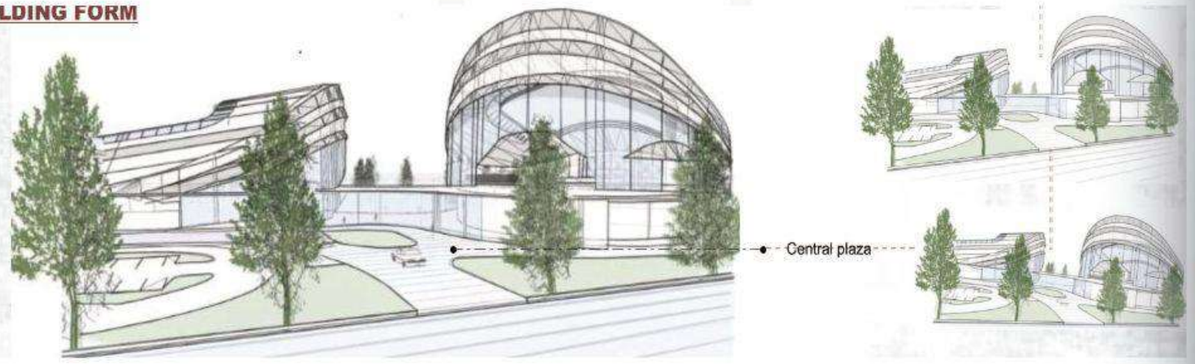
DESIGN PHILOSOPHY: HARMONIZING NATURE: BLURRING THE BOUNDARIES

THE PHILOSOPHY OF HARMONIZING NATURE EMPHASIZES THE SEAMLESS CONNECTION BETWEEN ARCHITECTURAL DESIGN AND THE NATURAL ENVIRONMENT. IN THIS APPROACH, THE GOAL IS TO INTEGRATE BUILT STRUCTURES SEAMLESSLY INTO THE SURROUNDING LANDSCAPE, CREATING A HARMONIOUS COEXISTENCE BETWEEN THE MAN-MADE AND THE NATURAL.

DESIGN CONCEPT

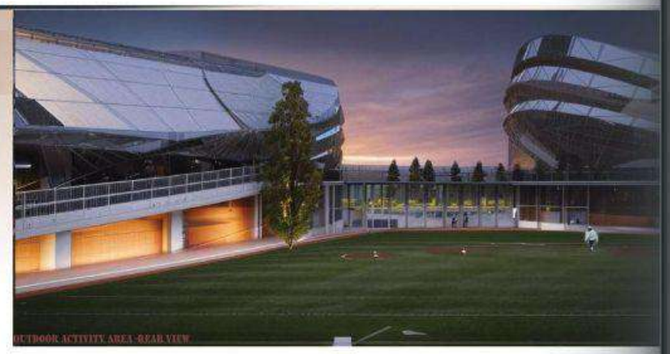
THE CONCEPT IS ROOTED IN THE DYNAMIC AND ORGANIC FORMS OF CIRCLES WITH NO EDGES, WHICH ARE THEN SLOPED TO ONE SIDE TO EMULATE A HILLY AND SLOPING NATURE. THE INTENTION IS TO CREATE A SPACE THAT PROVIDES A SENSE OF FLUIDITY AND MOVEMENT THROUGH THE INTERCONNECTED CIRCULAR FORMS. THE INTEGRATION OF SKY BRIDGES ALLOWS FOR ELEVATED VIEWPOINTS AND ENHANCES THE OVERALL EXPERIENCE OF THE SITE. THE CONCEPT INVOLVES DESIGNING A SPORTS HILL WITH FREE-FLOWING FORMS THAT SEAMLESSLY SLOPE TO THE GROUND.

BUILDING FORM



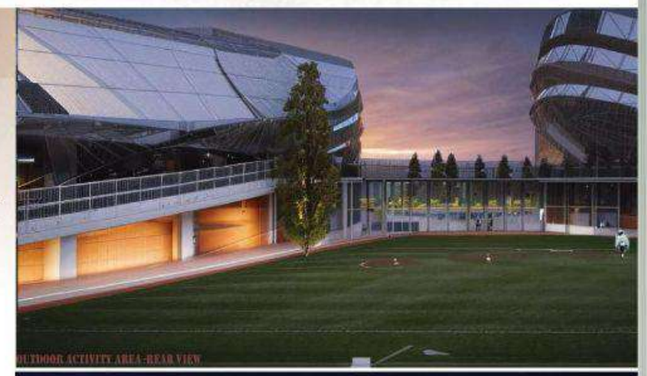
TIGONI SPORTS HILL.

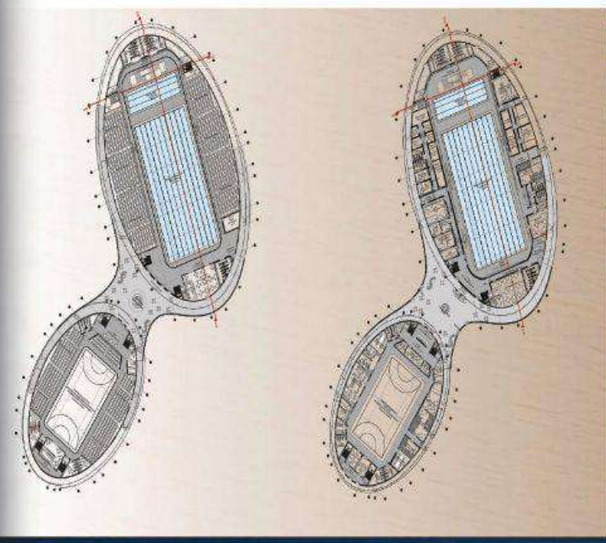
THE TIGONI SPORTS CENTER PROJECT IS A COMPREHENSIVE INITIATIVE FOCUSED ON DEVELOPING A PREMIER SPORTING DESTINATION IN THE TIGONI REGION. THIS MULTIFACETED ENDEAVOR AIMS TO CONSTRUCT A MODERN FACILITY THAT CATERS TO A WIDE RANGE OF ATHLETIC PURSUITS, INCLUDING BUT NOT LIMITED TO, SOCCER, TENNIS, BASKETBALL, AND SWIMMING. WITH A KEEN EMPHASIS ON PROMOTING HEALTH, WELLNESS, AND COMMUNITY ENGAGEMENT, THE CENTER WILL FEATURE STATE-OF-THE-ART INFRASTRUCTURE, EXPERT COACHING, AND INCLUSIVE PROGRAMS SUITABLE FOR INDIVIDUALS OF ALL AGES AND SKILL LEVELS. BY CREATING A VIBRANT HUB FOR SPORTS ENTHUSIASTS AND FOSTERING A CULTURE OF ACTIVE LIVING, THE TIGONI SPORTS CENTER ENDEAVORS TO ENRICH THE LOCAL COMMUNITY WHILE SERVING AS A BEACON FOR ATHLETIC EXCELLENCE IN THE REGION.

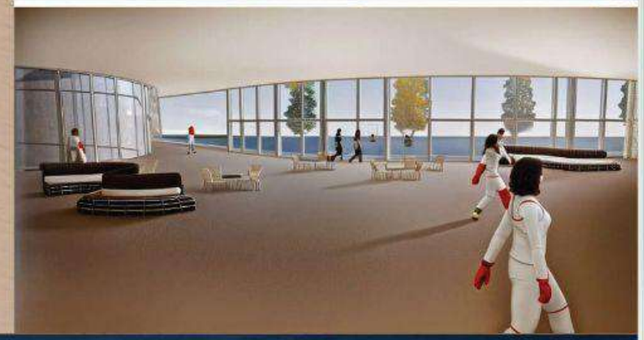


TIGONI SPORTS HILL.

THE TIGONI SPORTS CENTER PROJECT IS A COMPREHENSIVE INITIATIVE FOCUSED ON DEVELOPING A PREMIER SPORTING DESTINATION IN THE TIGONI REGION. THIS MULTIFACETED ENDEAVOR AIMS TO CONSTRUCT A MODERN FACILITY THAT CATERS TO A WIDE RANGE OF ATHLETIC PURSUITS, INCLUDING BUT NOT LIMITED TO, SOCCER, TENNIS, BASKETBALL, AND SWIMMING. WITH A KEEN EMPHASIS ON PROMOTING HEALTH, WELLNESS, AND COMMUNITY ENGAGEMENT, THE CENTER WILL FEATURE STATE-OF-THE-ART INFRASTRUCTURE, EXPERT COACHING, AND INCLUSIVE PROGRAMS SUITABLE FOR INDIVIDUALS OF ALL AGES AND SKILL LEVELS. BY CREATING A VIBRANT HUB FOR SPORTS ENTHUSIASTS AND FOSTERING A CULTURE OF ACTIVE LIVING, THE TIGONI SPORTS CENTER ENDEAVORS TO ENRICH THE LOCAL COMMUNITY WHILE SERVING AS A BEACON FOR ATHLETIC EXCELLENCE IN THE REGION.

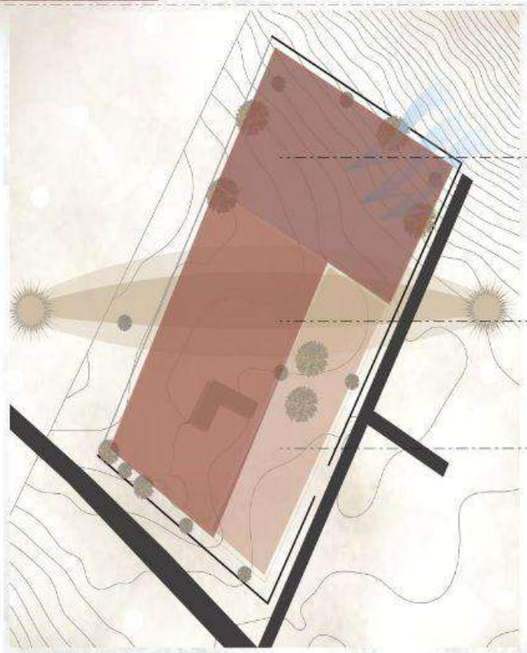






PRELIMINARY DESIGN

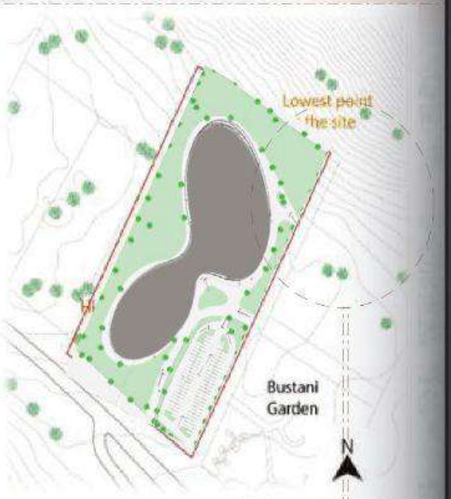
COMPOSITE MAP



Steep slope,Tke advantage of slope to do vertical parking underground.Suitable for basement parking.Creates a flat surface on top for outdoorr Activities.

Fairly flat.Suitable for Building design,Enhanced views of site and buildingds

Fairly flat and adjacent to the roads and indicative access points.Ideal for parking

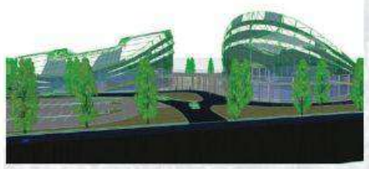


ZONE A ; Adjacent to roads and is fairly flat , suitable for entries and parking

ZONE B; Fairly flat and hence suitable for the building positioning

ZONE C; steeper side of the site , suitable for elevated structures and basement parking

PRELIMINARY DESIGN FORM



PRELIMINARY PLAN

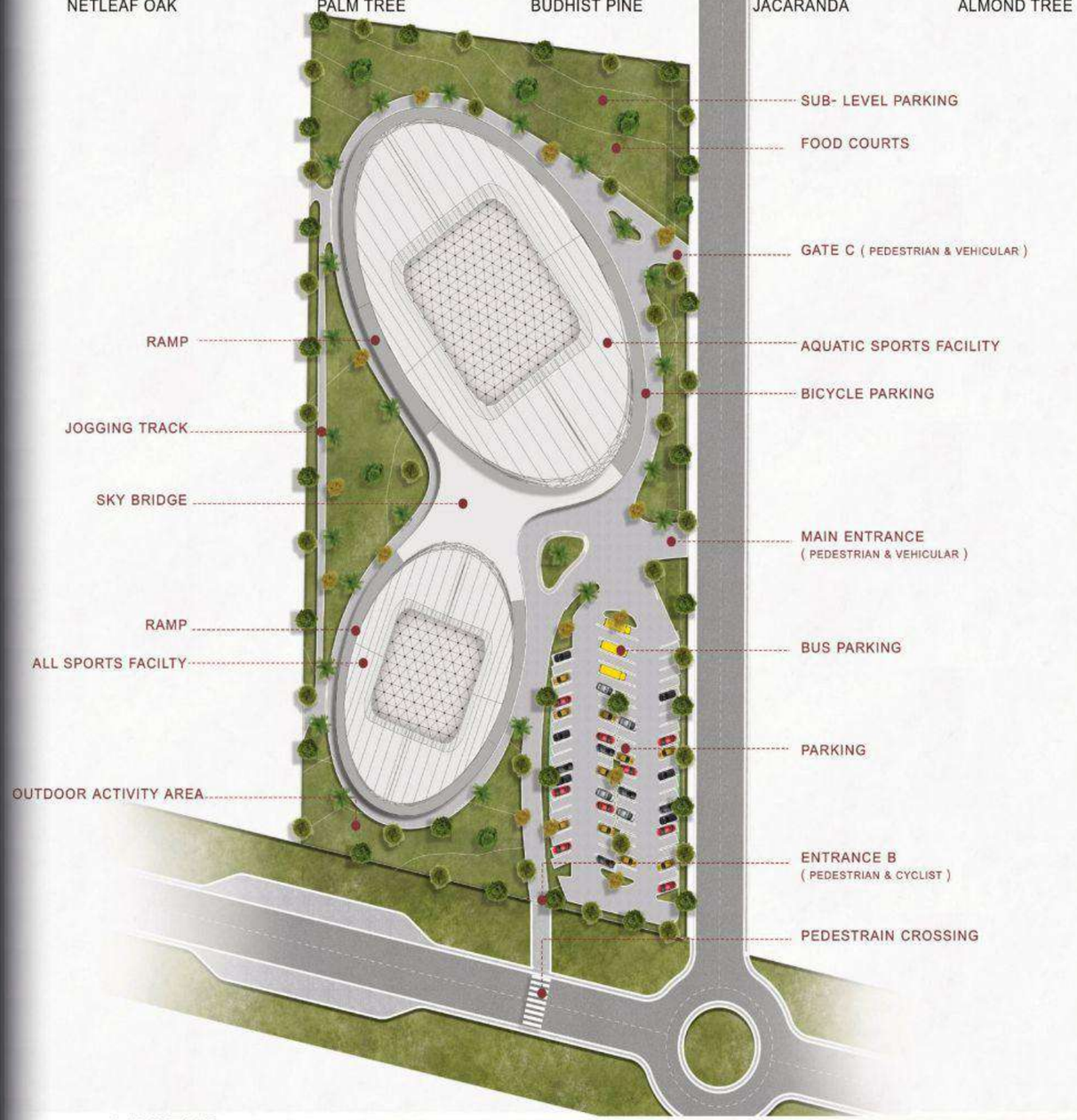
SUB LEVEL PARKING DESIGN

PRELIMINARY INTERIOR DESIGN (OBTAINED FROM PRELIMINARY PLANS AND FORM

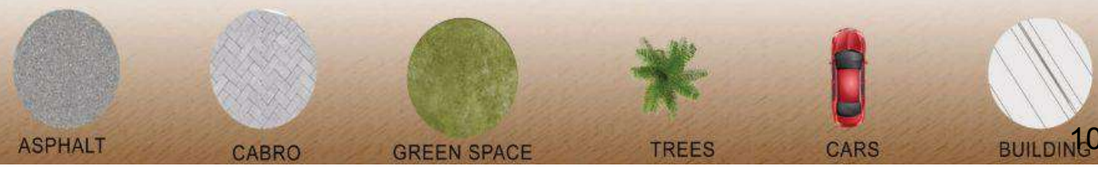
SITE PLAN

SCALE 1: 500

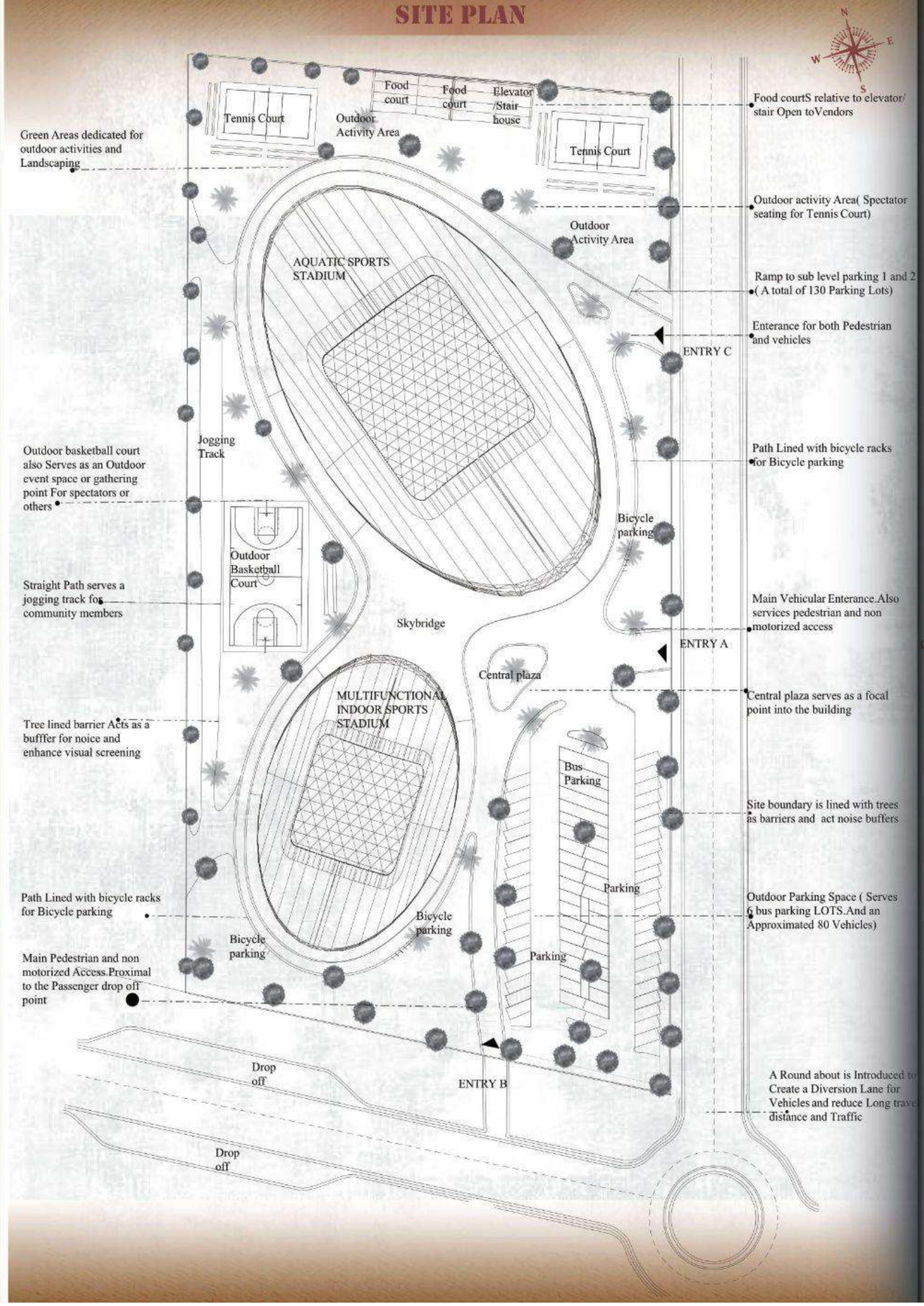
PLANT SELECTION



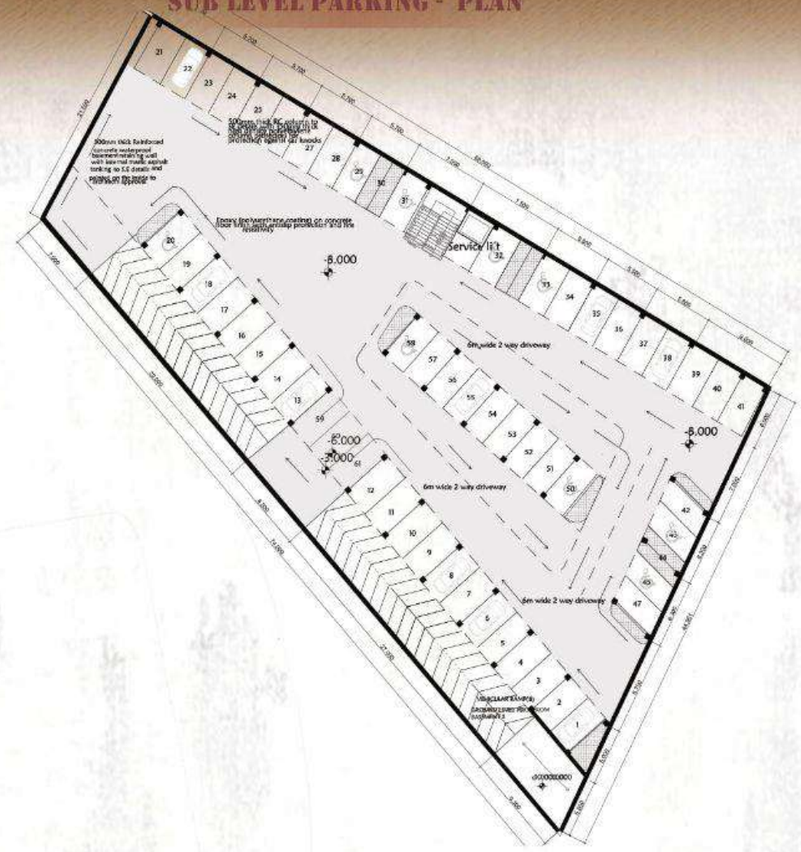
LEGEND



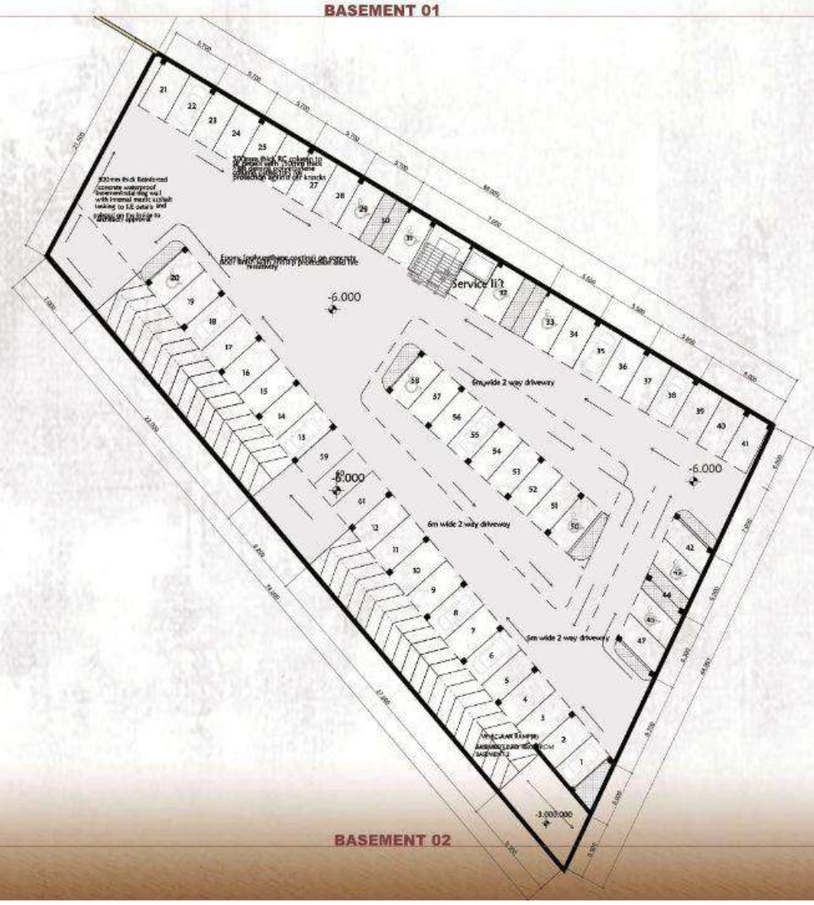
SITE PLAN



SUB LEVEL PARKING - PLAN

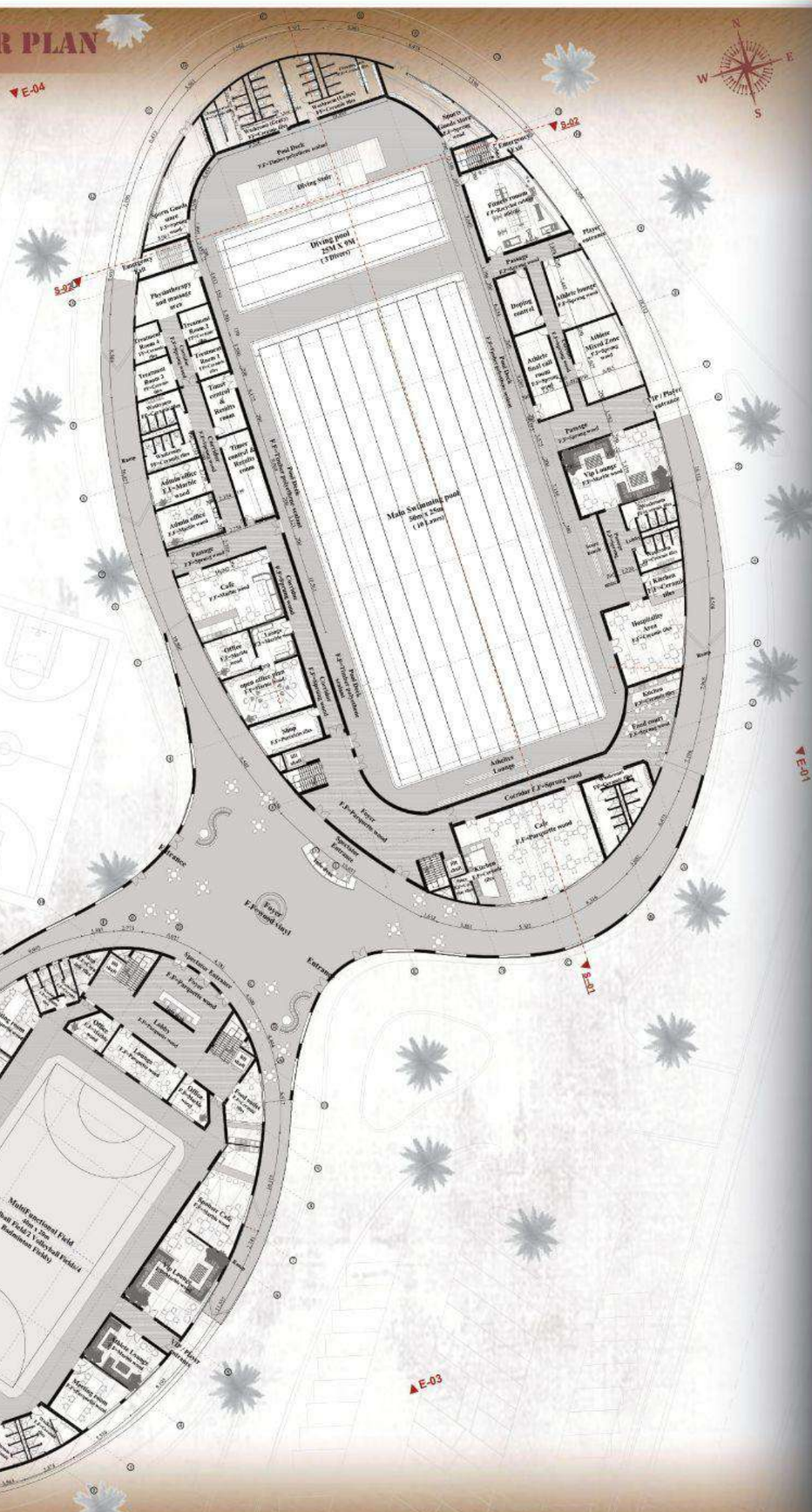


BASEMENT 01 1:200



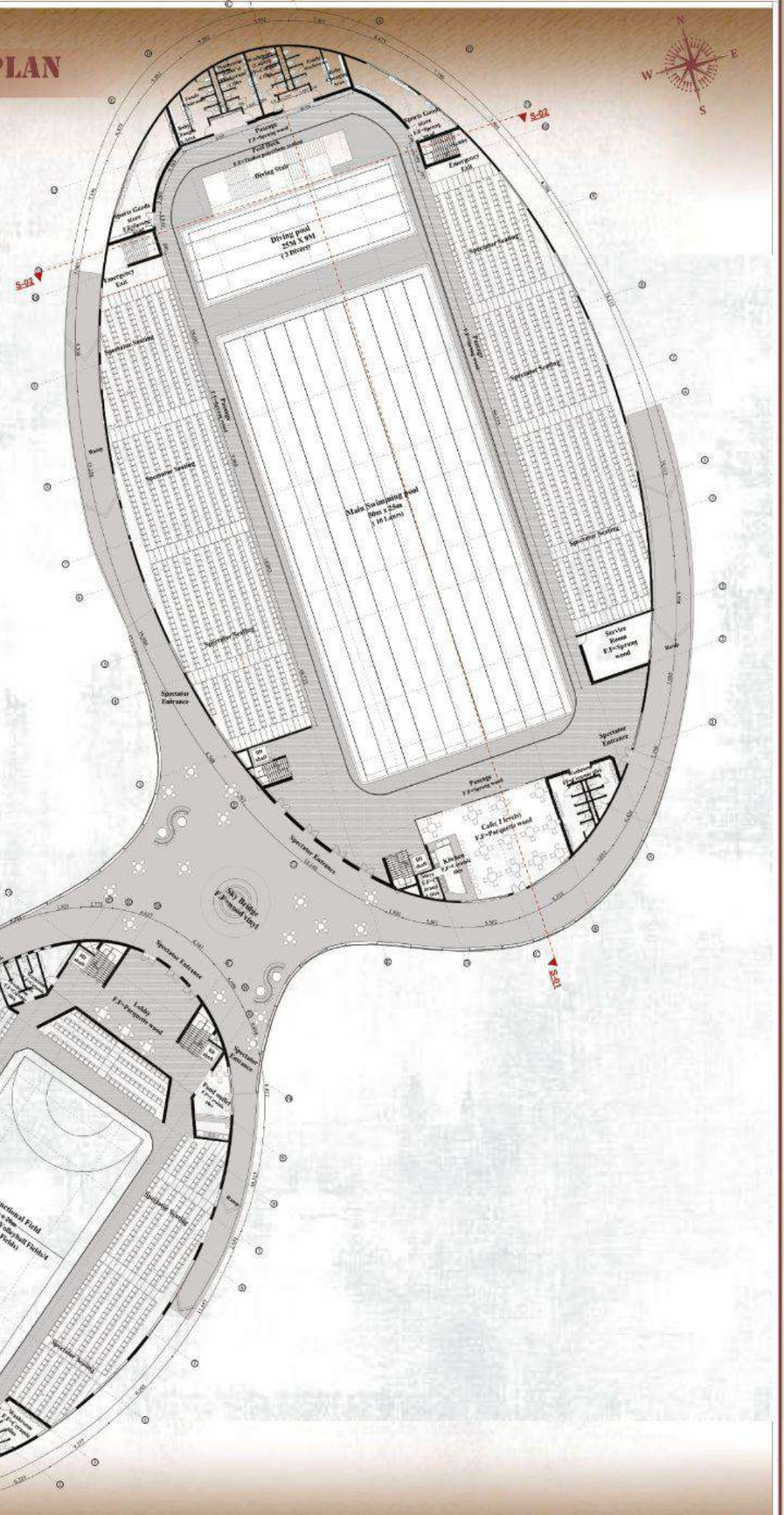
BASEMENT 02 1:200

GROUND FLOOR PLAN



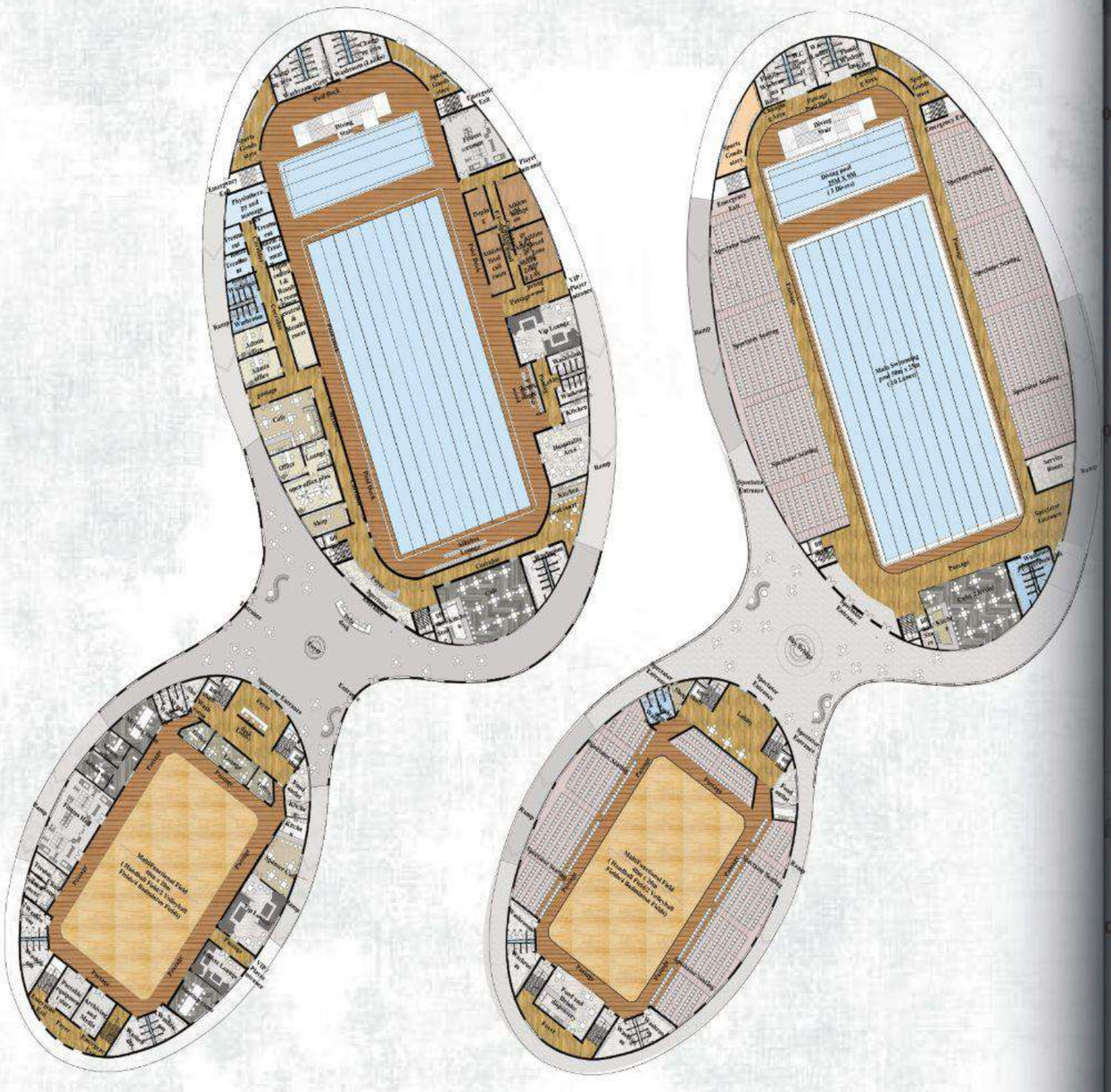
0. GROUND FLOOR PLAN 1:200

FIRST FLOOR PLAN



0. FIRST FLOOR PLAN 1:200

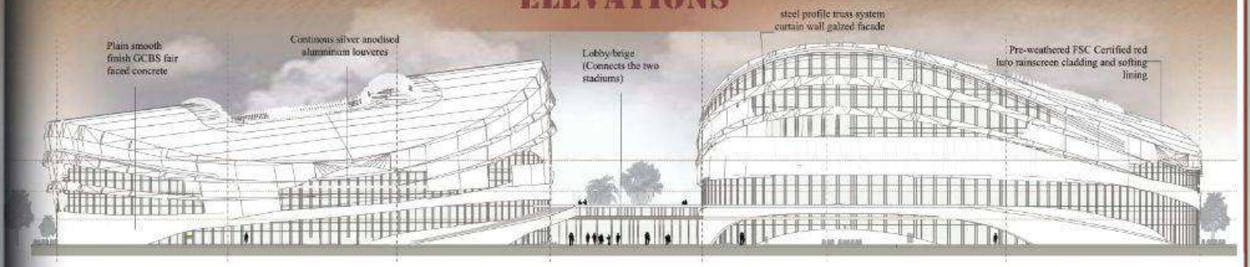
PRESENTATION DRAWINGS



PRESENTATION DRAWING.
GROUND FLOOR PLAN.
SCALE 1:300

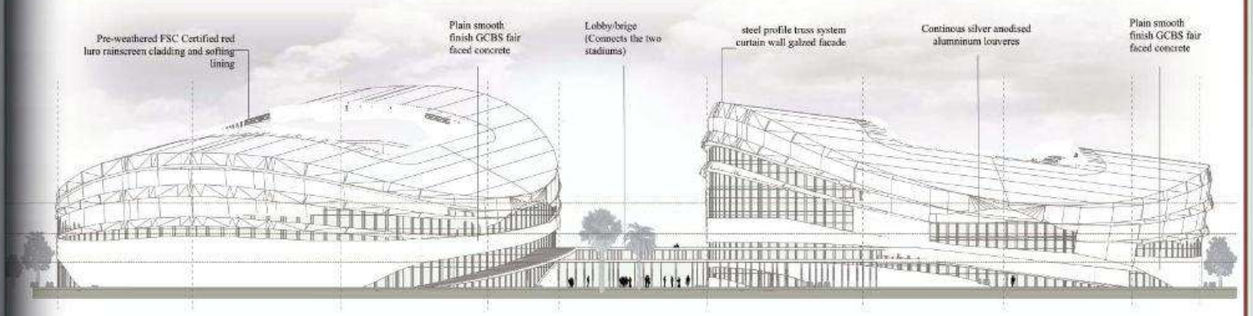
PRESENTATION DRAWING.
FIRST FLOOR PLAN.
SCALE 1:300

ELEVATIONS

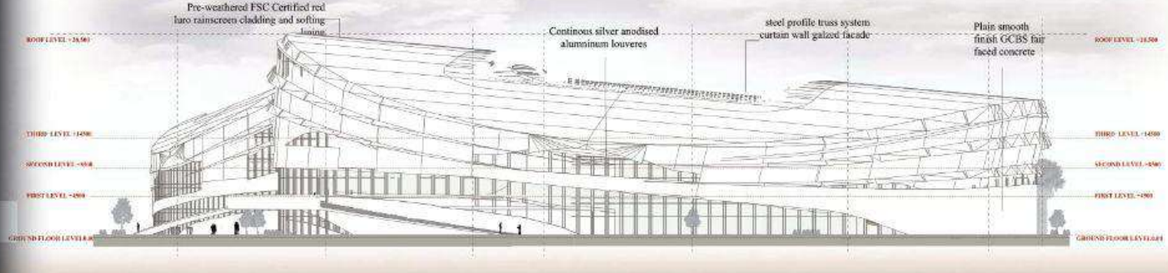


EAST ELEVATION 1:250

SOUTH ELEVATION 1:250

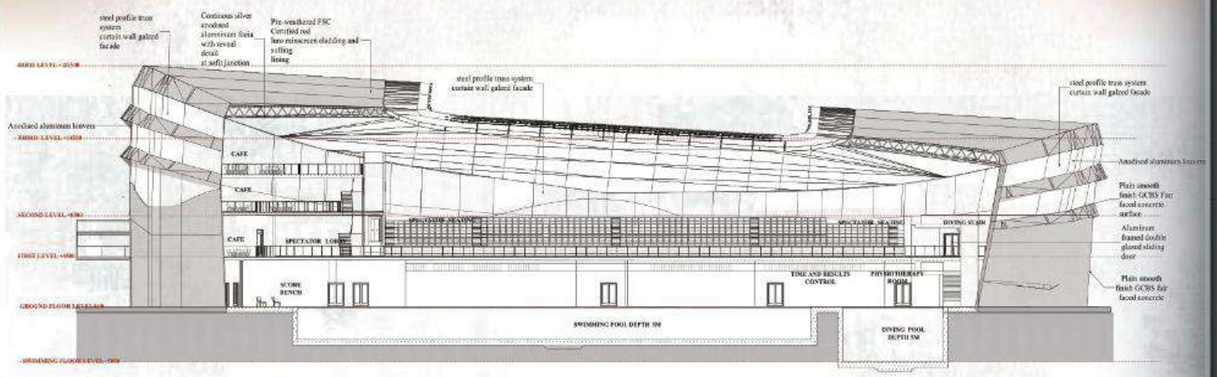


WEST ELEVATION 1:250

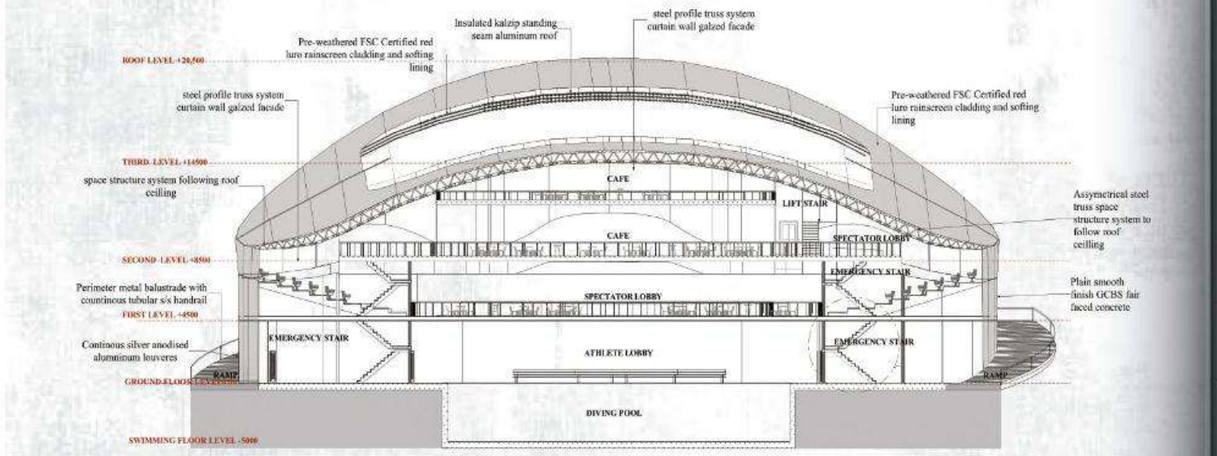


NORTH ELEVATION 1:250

SECTIONS

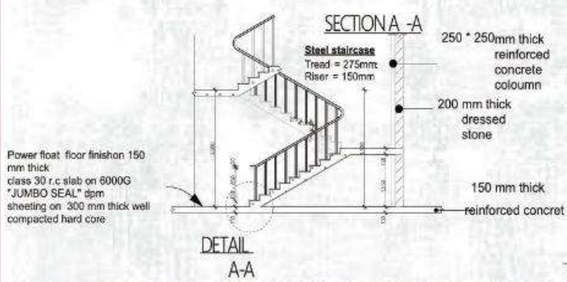


0. SECTION 02 1:200

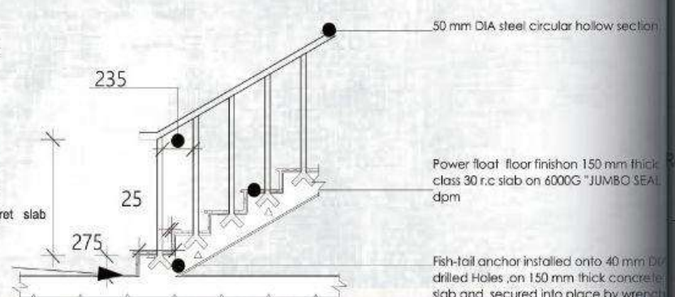


0. SECTION 02 1:150.00

STAIRCASE DETAIL SCALE 1.20

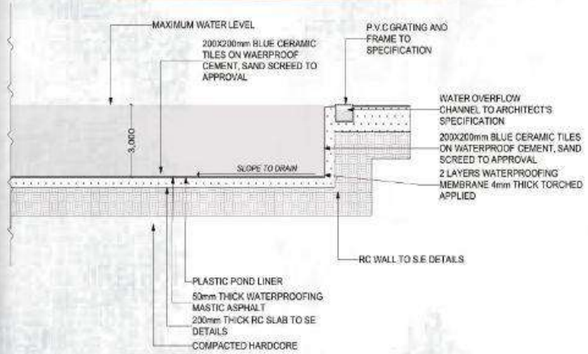


DETAIL A-A SCALE 1.10

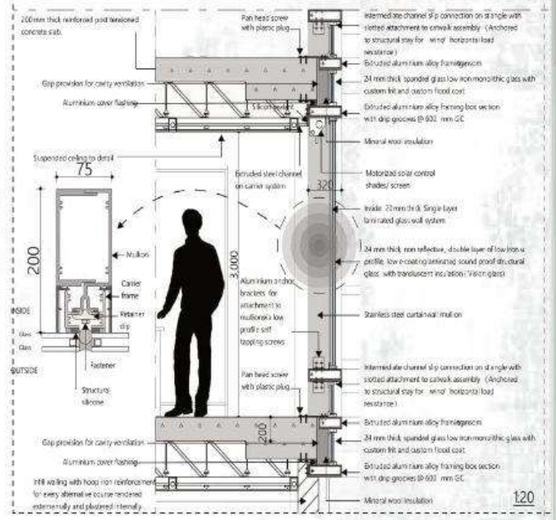


CONSTRUCTION DETAILS

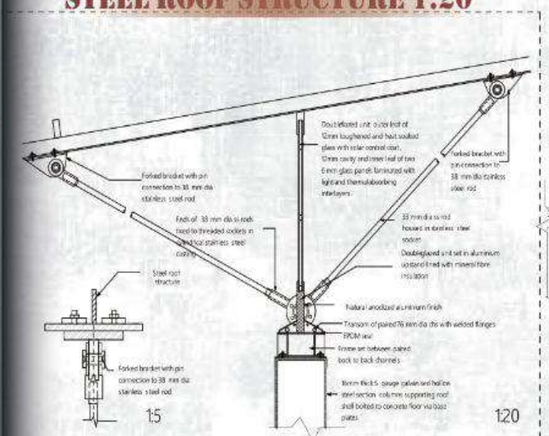
SWIMMING POOL DETAILS 1:100



CURTAIN WALLING DETAIL 1:20

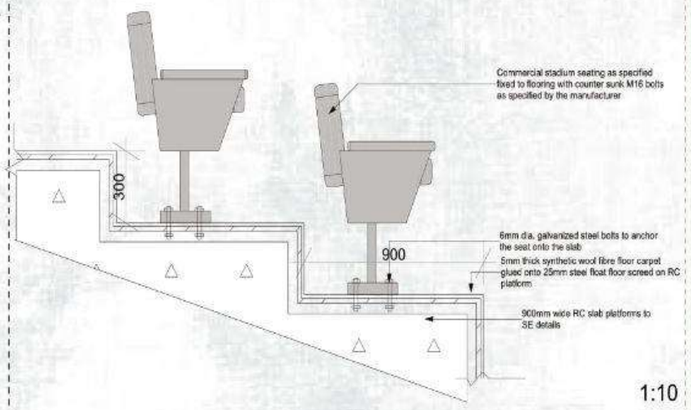


STEEL ROOF STRUCTURE 1:20



Roof cover with conservatory and energy conversion system

STADIUM SEATS DETAILS



1:10

COMMERCIAL CENTRE

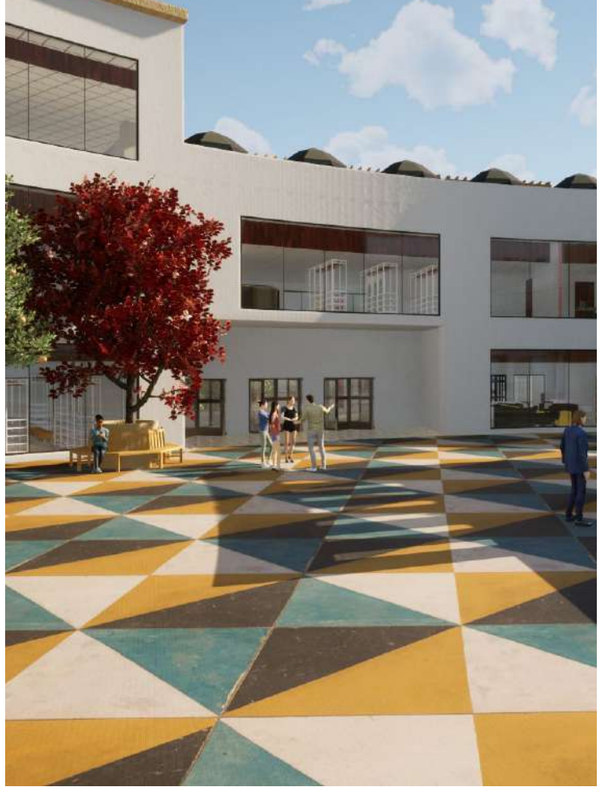
DESIGNS

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

Akinyi Odhiambo
Collins Shamala

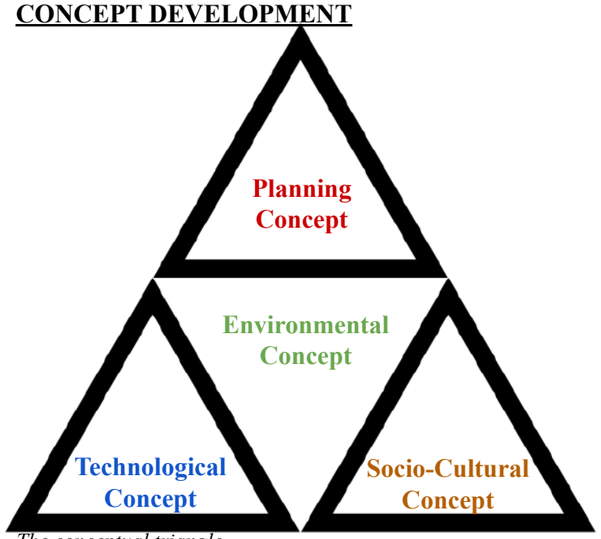
NAME: Mary Akinyi Odhiambo
INSTITUTION: Department of Architecture and Interior Design (DAID),
School of Engineering and Architecture (SEA)
Kenyatta University (KU)
EMAIL ADDRESS: maryakinyi730@gmail.com

BIOGRAPHY:
Akinyi Odhiambo is a student of architecture at Kenyatta University. She is passionate about humane design that represents individual character in a world where imitations are rampant. Akinyi aims to conceive projects to create meaningful spaces that meet the needs of the end users and the environment, while tying the project to the geophysical conditions and contextual building traditions.
She has gained necessary work experience through various attachments at the State Department for Public Works. By working with licensed practicing architects Akinyi has developed competitive technical drawing skills, presentation skills, rendering skills and aspects of site inspection and supervision of works.



COMMERCIAL CENTER; TIGONI
BY: AKINYI ODHIAMBO

CONCEPT DEVELOPMENT



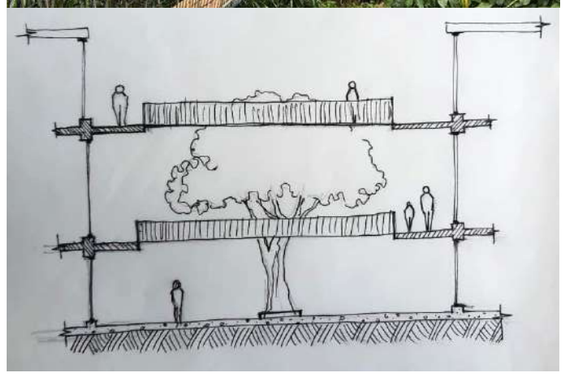
The conceptual triangle
Source:The Relationship between Imageability and Form in Architecture

PLANNING CONCEPT:

Forest groves often grow along or around a water source; Spaces are planned along a central spline with a water feature.

Central spine leading to entrance
Source:
https://worldlandscapearchitect.com/green-entrance-for-a-new-office-building-near-brussels-airport/?v=3a1ed7090bfa

Some forest groves have treetop walkways that enable views of the forest scenery; Wings of the building are to be connected with elevated walkways cutting across the central spline/courtyard.



Section sketch of elevated walkways
Source: Akinyi Odhiambo, 2024

TECHNOLOGICAL CONCEPT:

The weaving of a kiondo; Use of exposed space grid structures to mimic the interweaving of the traditional kikuyu basket. The space grid also permits for design of longer spans to provide large open public spaces.

Weaving of kiondoo
Source: https://mifuko.com/en-us/pages/basket-weaving

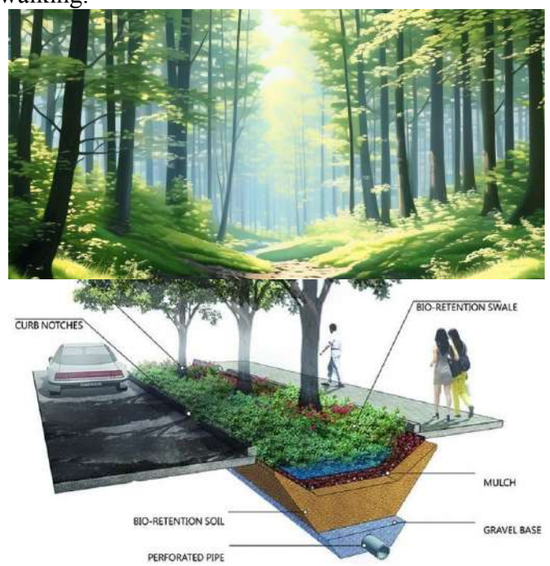
Space grid structure
Source:
https://discourse.mcneel.com/t/how-to-torque-and-line-up-gridshell-beams/168689

Verticality of tree trunks; This is mimicked by use of vertical elements in the facade. This is to be done by use of timber elements and openings.

Vertical building elements
Source:
https://ar.pinterest.com/pin/570268371565206317/?amp_client_id=CLIENT_ID%28_%29&mweb_unauth_id=

ENVIRONMENTAL CONCEPT:

Forest groves have a rich plant life and are dense enough to create suitable microclimate; The project will provide rich plant life especially along walkways to provide comfortable environment for walking.



Bioswale detail
Source:
https://www.researchgate.net/figure/Bioswale-concept-diagram-1-Dirty-and-polluted-water-from-rooftops-roads-and-parking_fig1_335219312

Organic form of the forest grove acts as an efficient windbreaker; Use of a curvilinear form to reduce turbulence due to the action of winds on the site.

SOCIO-CULTURAL CONCEPT:

Traditional Kikuyu colours; The project is to make use of traditional Kikuyu colours in design of its facades and common spaces.

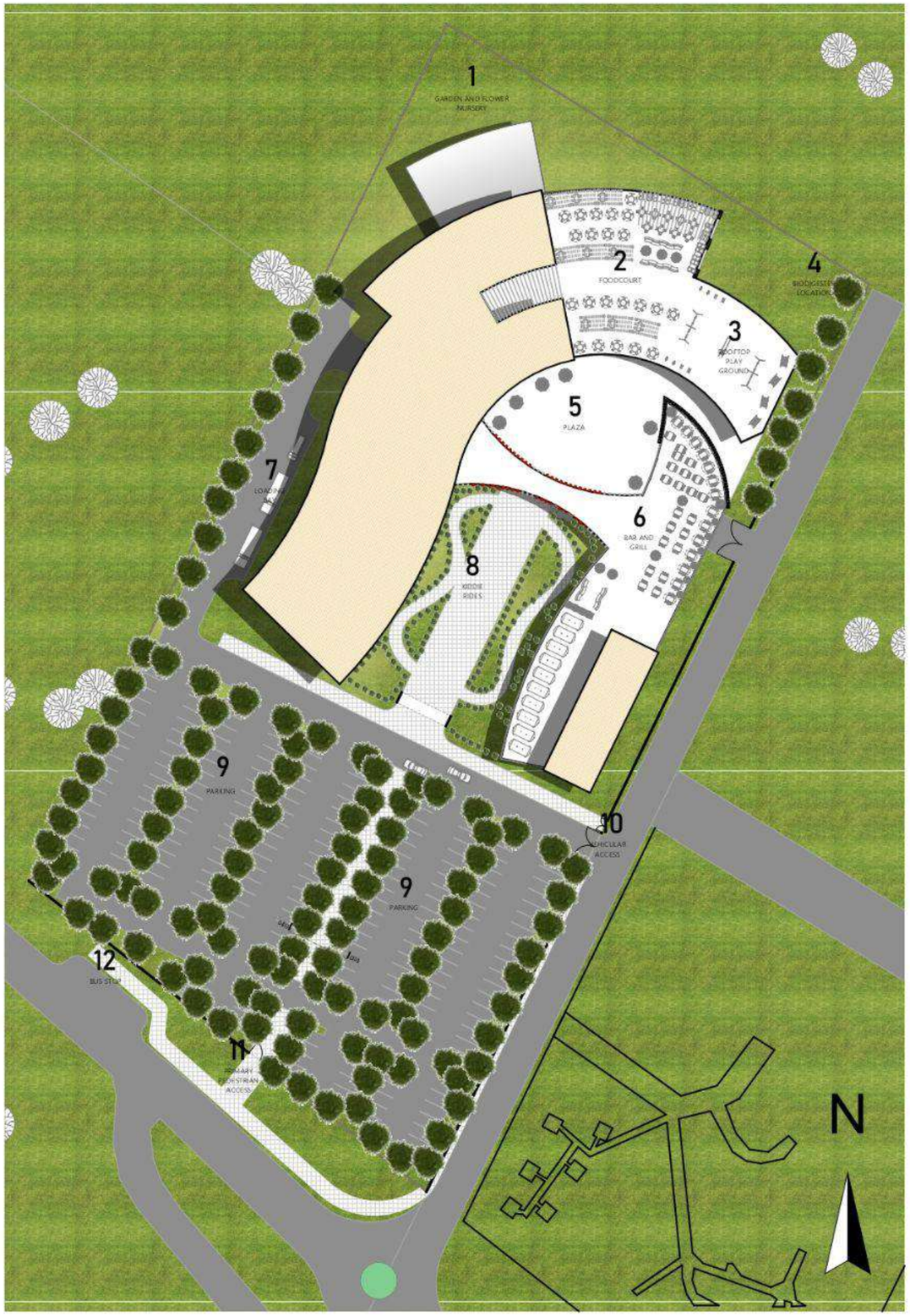
Kikuyu traditional colours
Source:
https://mukuyu.wordpress.com/2019/01/22/gikuyu-traditional-colors/#:~:text=The%20women%20were%20predominantly%20ochre,with%20some%20patches%20of%20white.

Textures inspired by traditional Kikuyu building element; The project will make use of timber finishes and cladding, as well as, stucco to mimic the mud plaster on some traditional houses.

Kikuyu traditional houses
Source: https://goodtitevs.best/product_details/45071322.html

Traditional weaved basket; Use of weaved rope wall partitions, ceilings and cladding.

Woven building elements
Source:
https://buildingandinteriors.com/hallway-ceiling-designs/



SITE PLAN
SCALE 1:1000

ENTRY COURSEWAY
PERSPECTIVE VIEW

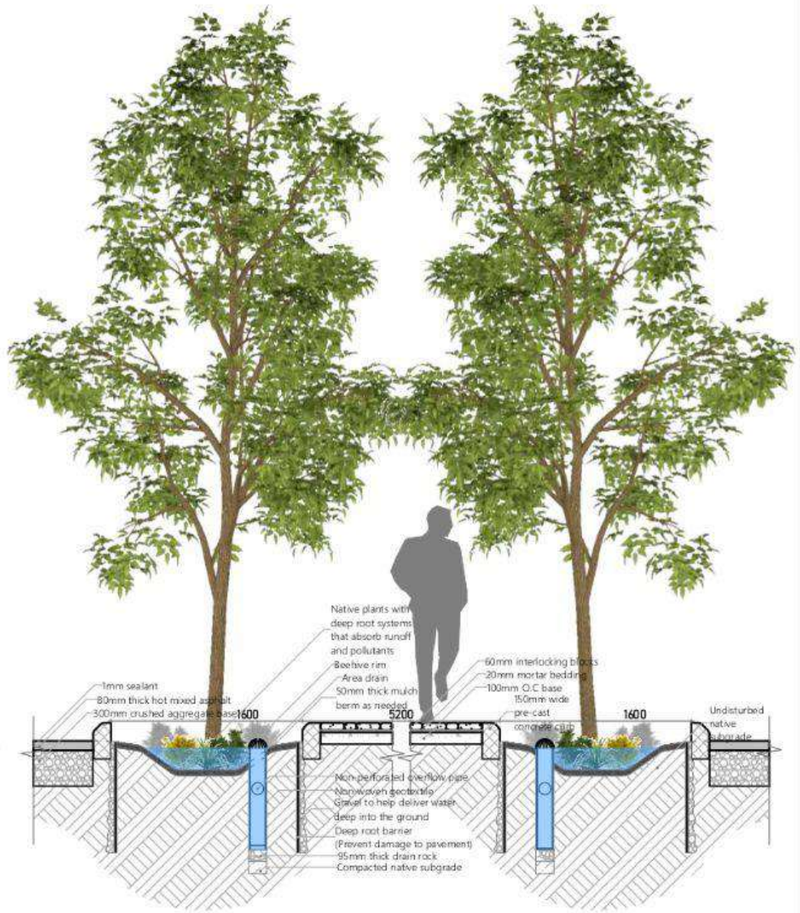
LEGEND
1- GARDEN AND FLOWER NURSERY
2- ROOFTOP FOODCOURT
3- ROOFTOP PLAY GROUND
4- BIODIGESTER LOCATION
5- PLAZA
6- ROOFTOP BAR AND GRILL
7- LOADING BAY
8- KIDDIE RIDES
9- PARKING
10- VEHICULAR ACCESS
11- PRIMARY PEDESTRIAN ACCESS
12- BUS STOP

Anticipated users are locals and students from St. Pauls University using public transport, thus higher priority is given to pedestrian access and circulation through the site.

Vehicular access is limited to the eastern boundary to reduce traffic congestion likely to be caused on Limuru Road.

Parking spots are a limited number with consideration for bicycle parking along the pedestrian walkway. Parking is lined with native landscaping to preserve biodiversity, provide shade, reduce soil erosion and facilitate infiltration of water into the soil.

The layout of the site is aimed at providing an interactive experience with nature as one moves through the different spaces.



BIOSWALE DETAIL D(01)[SITE PLAN]
SCALE 1:50

Gaming arcade provides ample space for various activities including VR stations, darts, PS, X-box, LAN gaming among others.

Spaces for relaxation and interaction are also provided. These also act as waiting areas for gaming sessions that occur in turns

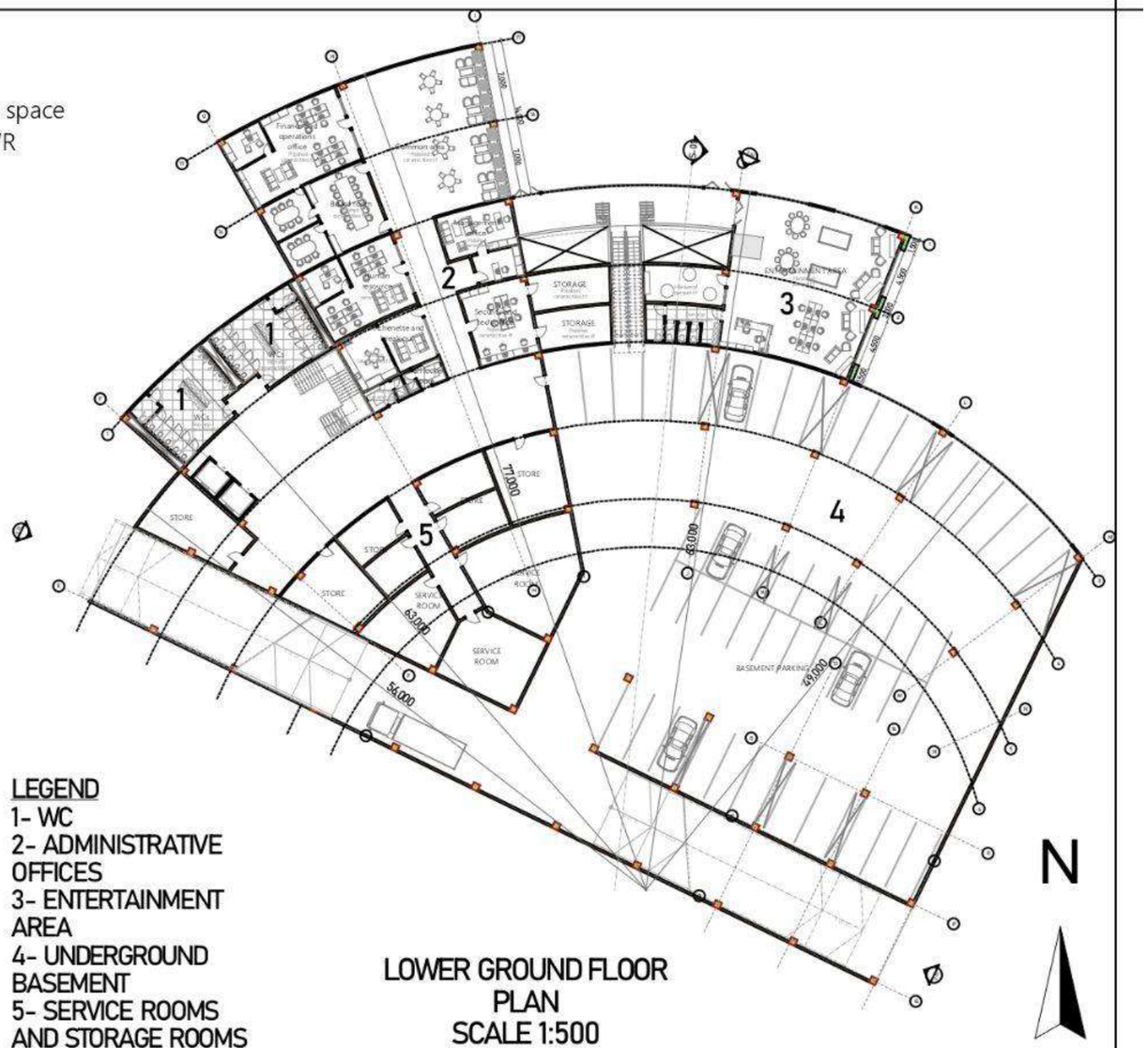
GAMING ARCADE PERSPECTIVE VIEW

Ample lighting is provided by use of overhead lights

Vents are provided aiding in ensuring proper ventilation within the underground parking.

Epoxy finish on concrete subfloor

UNDERGROUND PARKING PERSPECTIVE VIEW



LEGEND
1- WC
2- ADMINISTRATIVE OFFICES
3- ENTERTAINMENT AREA
4- UNDERGROUND BASEMENT
5- SERVICE ROOMS AND STORAGE ROOMS

LOWER GROUND FLOOR PLAN
SCALE 1:500

The lower ground level is zoned for administration, service, storage and entertainment. The placement of the service rooms, storage and administrative space in the basement ensures:

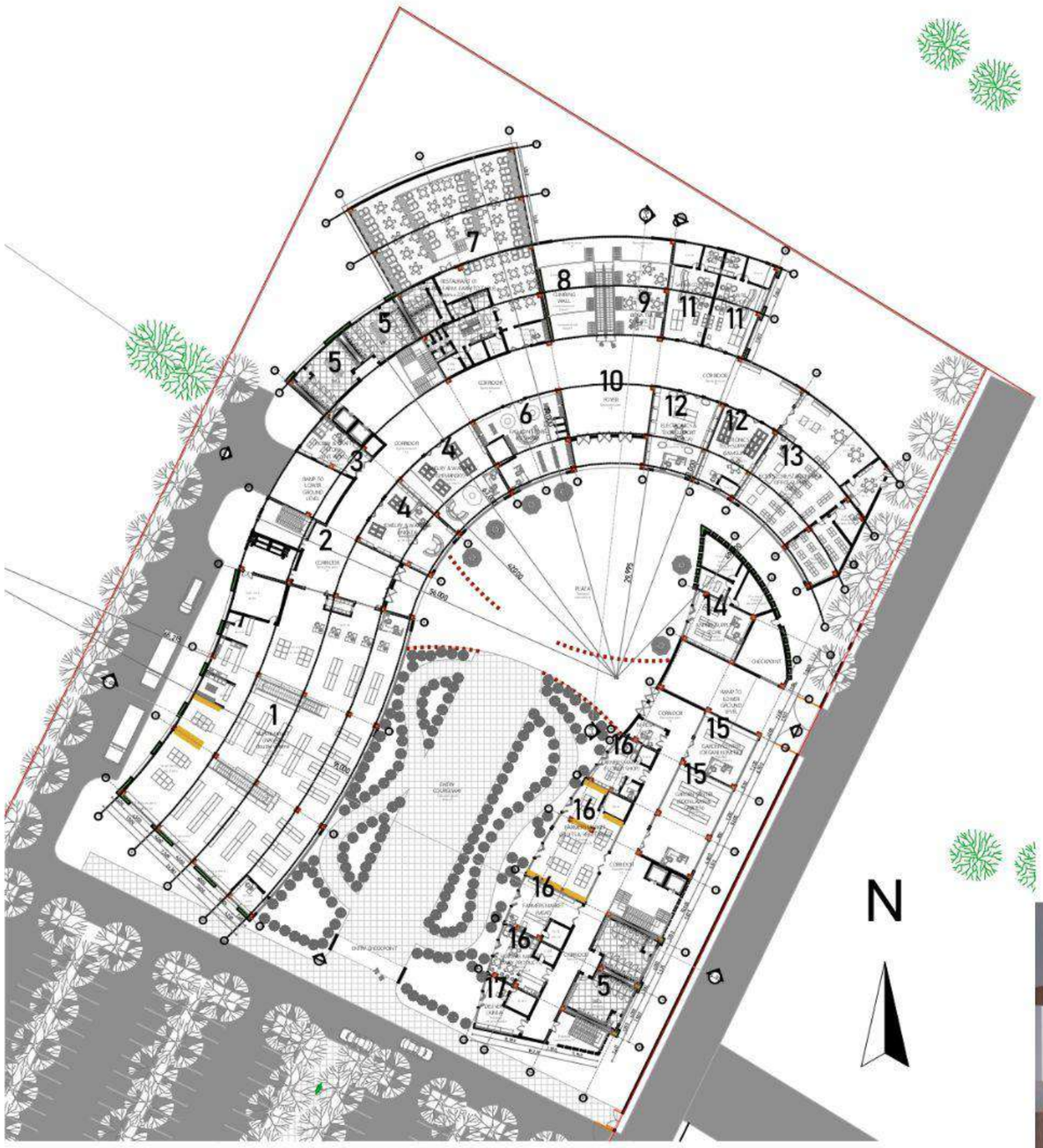
1. Efficient space utilization since space is less desirable for retail. This also ensures that prime floor area is used for retail.
2. Isolation of noise from retail spaces.
3. Security and privacy of crucial functions.
4. Logistical efficiency since it does not interfere with retail activity while ensuring smooth operations.

The basement parking is for use by mall staff and tenants.

The placement of the entertainment area in the lower ground level is also advantageous since it offers:

1. Efficient placement of entertainment venues such as the arcade. This frees up upper levels for retail.
2. Noise and vibration isolation from retail zones.
3. An ambiance and atmosphere suitable for immersive contained entertainment experiences such as virtual reality.
4. Easy security and crowd control by provision of control over access points.

An added advantage is the provision of single aspect views from the floor to ceiling window and an outdoor sitting common area for staff.



GROUND FLOOR PLAN
SCALE 1:750

LEGEND
1- SUPERMARKET
2- CORRIDOR
3- HOBBY & CRAFT STORE
4- JEWELRY & WATCHES
5- WC
6- FASHION STORE
7- RESTAURANT
8- CLIMBING WALL
9- CAFE
10- FOYER
11- PHONE SHOP
12- ELECTRONICS & TECH SUPPORT
13- BOOKSTORE
14- ANIMAL SUPPLY STORE
15- GARDEN CENTER
16- FARMERS MARKET
17- DELIVERY STORE

Since the mall is located in an agricultural region, the farmers market provides space for locals to sell their produce.
These are supplemented by other stores that provide basic needs such as the supermarket and others that provide luxury goods such as the jewelry stores.

FOYER PERSPECTIVE VIEW

ENTRY COURSEWAY AND PLAZA PERSPECTIVE VIEW

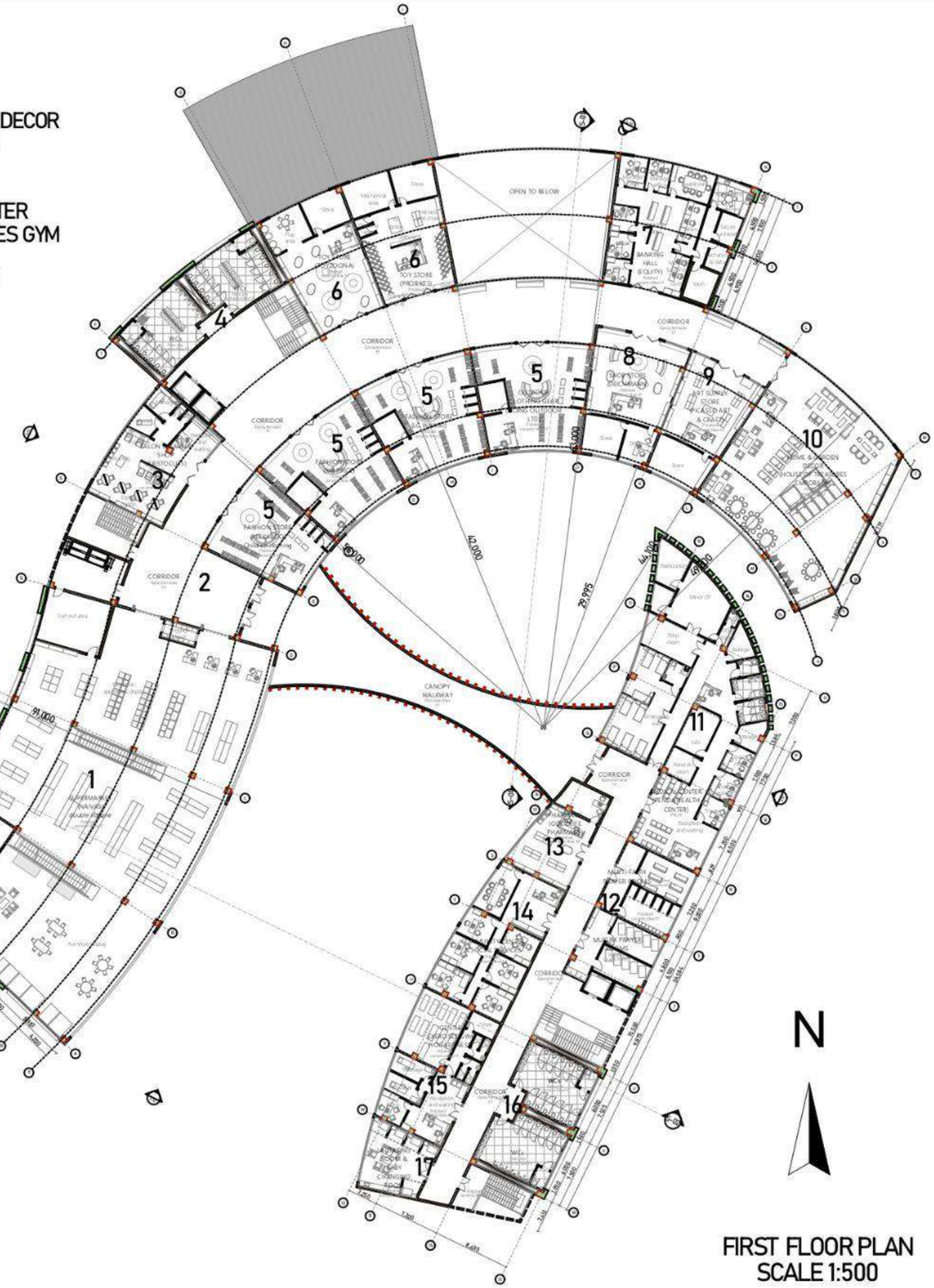
The two wings of the building are connected by the canopy walkway which also provides a viewing deck for the surrounding environment.

Multi-faith prayer rooms are provided as well as a lactating and baby changing room. These are support facilities that ensure comfort for the different users of the mall.

Wide corridors provide ample space for the expected flow of human traffic. Spaces are, therefore, amply ventilated.

LEGEND

1- SUPERMARKET
2- CORRIDOR
3- SALON & BARBER SHOP
4- WC
5- FASHION STORE
6- TOY STORE
7- BANKING HALL
8- SHOE STORE
9- ART SUPPLY STORE
10- HOME & GARDEN DECOR
11- MEDICAL CENTER
12- PRAYER ROOMS
13- PHARMACY
14- COMMUNITY CENTER
15- GENTLE EXERCISES GYM
16- WC
17- LACTATING ROOM



FIRST FLOOR PLAN
SCALE 1:500

Exposed dowel laminated timber with grooves for lighting fixtures provides a feeling of warmth

Glulam columns providing structural support and aesthetic appeal

1000mm high wall that acts as the railing

Epoxy terrazzo floor finish

The walkways provide clear views in multiple directions

PERSPECTIVE VIEW FROM THE FIRST FLOOR WALKWAY

Wall used for aesthetic purposes

Shallow rooted plants around interactive spaces

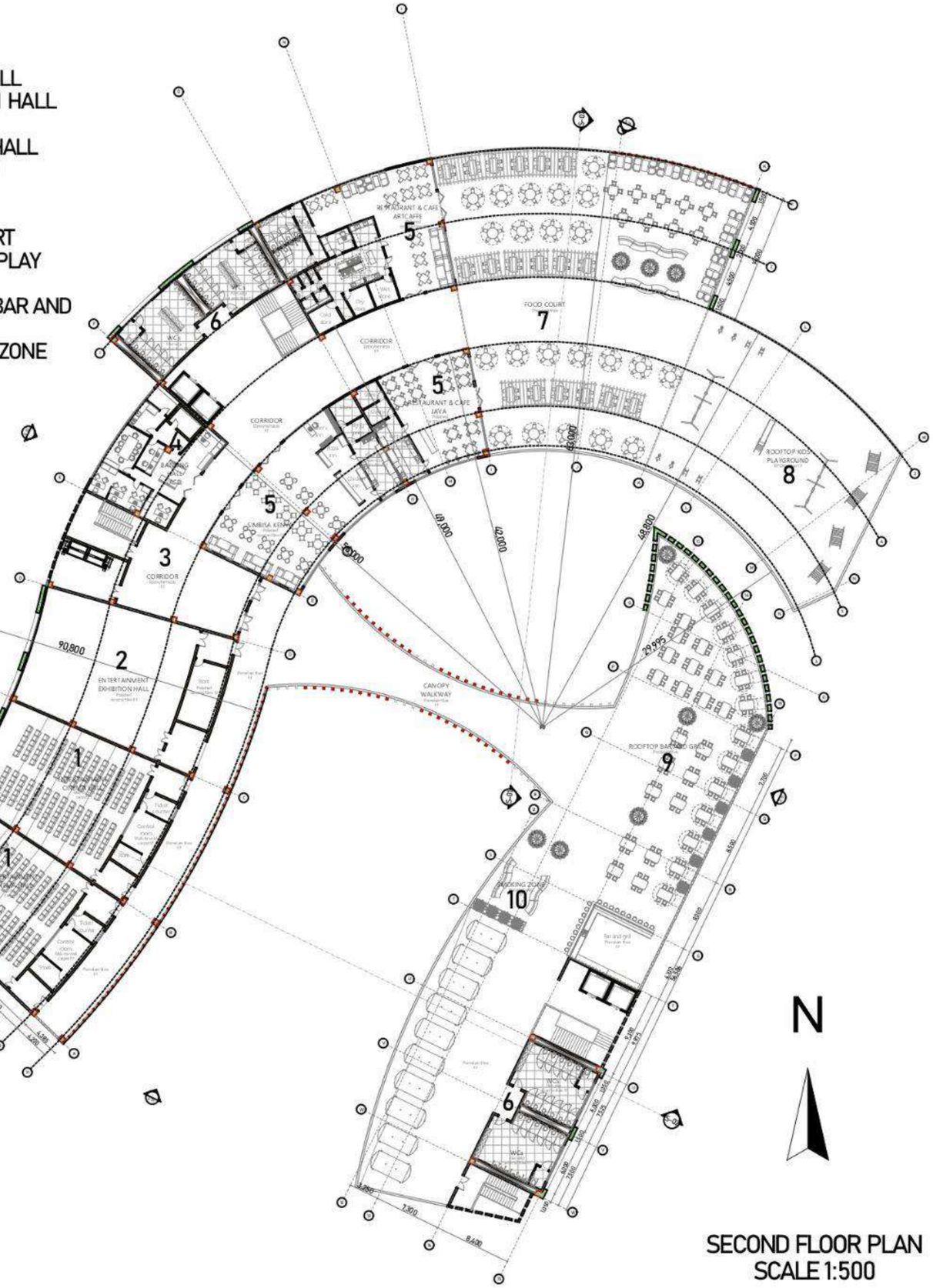
Outdoor dining furniture made of steel and wood

Porcelain tile f.f

FOODCOURT
PERSPECTIVE VIEW

LEGEND

1- CINEMA HALL
2- EXHIBITION HALL
3- CORRIDOR
4- BANKING HALL
5- FAST FOOD RESTAURANT
6- WC
7- FOOD COURT
8- ROOF TOP PLAY GROUND
9- ROOFTOP BAR AND GRILL
10- SMOKING ZONE



SECOND FLOOR PLAN
SCALE 1:500

Movie projected onto plain wall

Wall lights with dimmer switches to provide different ambience for different uses

Audience seating made of sound insulating fabric

Wall-to-wall carpet floor finish

CINEMA HALL PERSPECTIVE VIEW

Wall acts as a wind breaker

Temporary parasols used to provide shade

Plants used for aesthetic quality

Open space provided for use as a dance floor. Porcelain tiles floor finish.

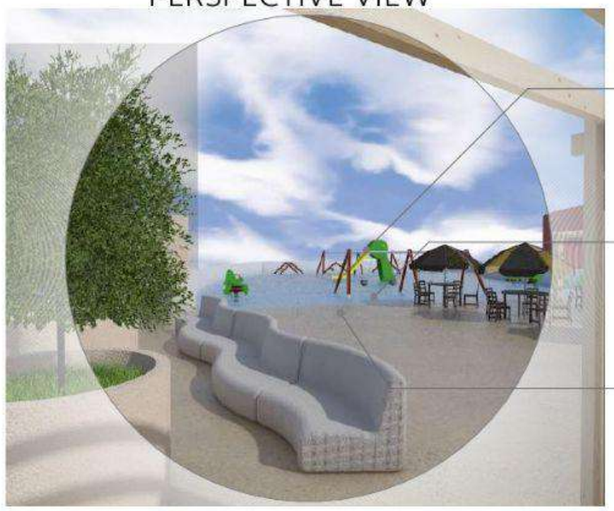
BAR AND GRILL PERSPECTIVE VIEW

Galvanised steel water tanks used to provide water storage on terrace level

Plants used for aethetics

Providing a designated smoking zone reduces nuisance to non-smokers

WATER STORAGE AND SMOKING ZONE PERSPECTIVE VIEW



Swings, slides and monkey bars are fixed to the structural slab

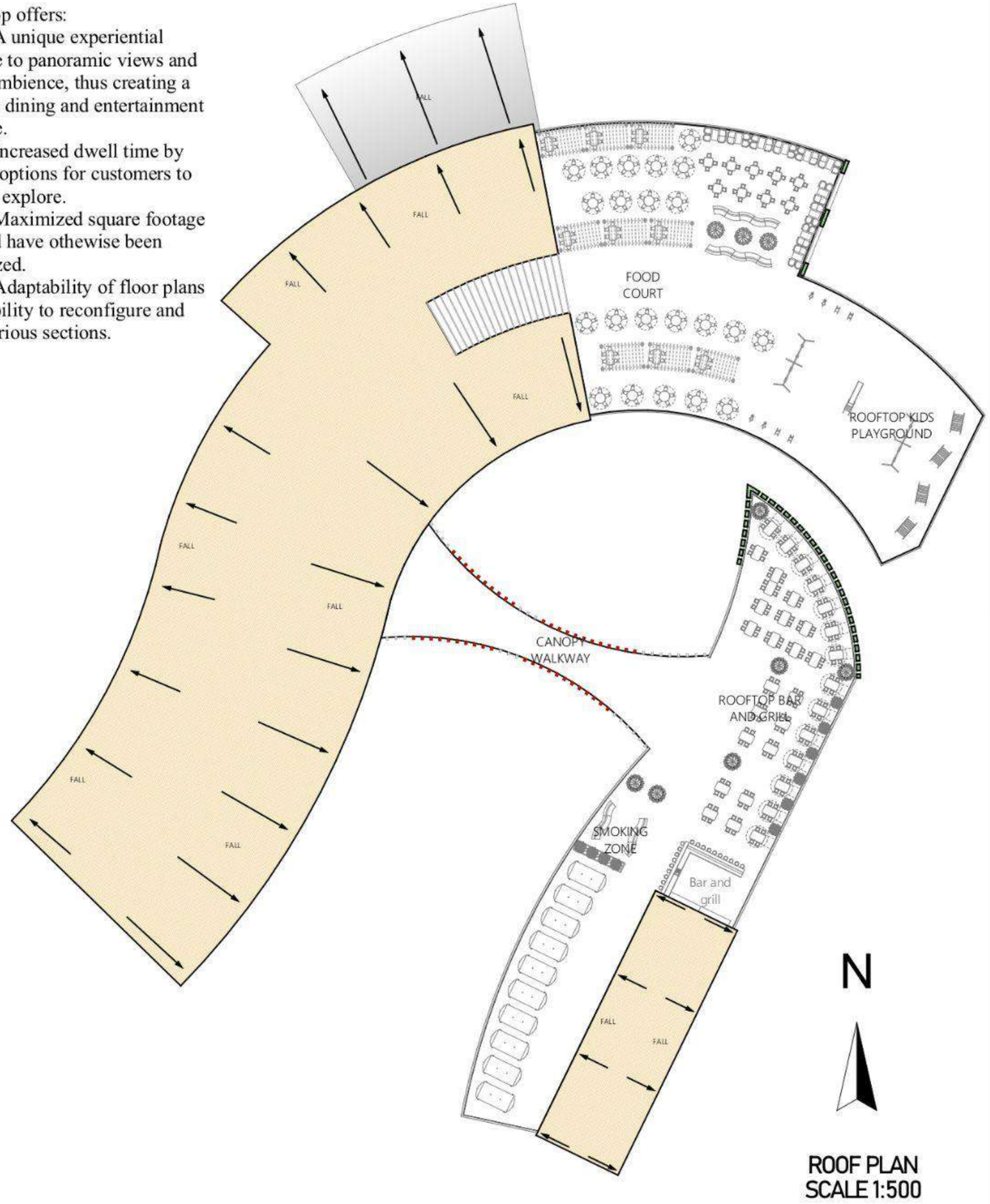
EPDM rubber f.f to cushion play area

Play area is in close proximity to food court and can be easily monitored

ROOFTOP KIDS PLAY AREA PERSPECTIVE VIEW

The rooftop offers:

1. A unique experiential appeal due to panoramic views and open-air ambience, thus creating a distinctive dining and entertainment experience.
2. Increased dwell time by providing options for customers to linger and explore.
3. Maximized square footage that would have othewise been underutilized.
4. Adaptability of floor plans thus flexibility to reconfigure and expand various sections.



ROOF PLAN
SCALE 1:500

ELEVATION 01
SCALE 1:400

ELEVATION 02
SCALE 1:400

ELEVATION 03
SCALE 1:400

ELEVATION 04
SCALE 1:400

ELEVATION DESIGNS

Each elevation is designed to be unique and have a uniform design that is:

1. Aesthetically appealing. The elevations define the overall architectural style and visual character of the building. For this design, arches and vertical openings are dominan. The design is thoughtful and aimed at making the building visually striking and memorable.

2. Functional. Different elevations serve different functional purposes; Elevation 01 has the basement entrance, elevation 02 is the main entrance, elevation 03 has the loading bay and elevation 04 is designed to provide extensive views of the landscape. The elevation design balances form and function to optimize building's operational efficiency.

3. Contextually integrated. The elevations consider the surrounding environment and neighbourhood context. Though the building is horizontal, it stands out in relation to Bustani Gardens due to its contemporary elevation design.

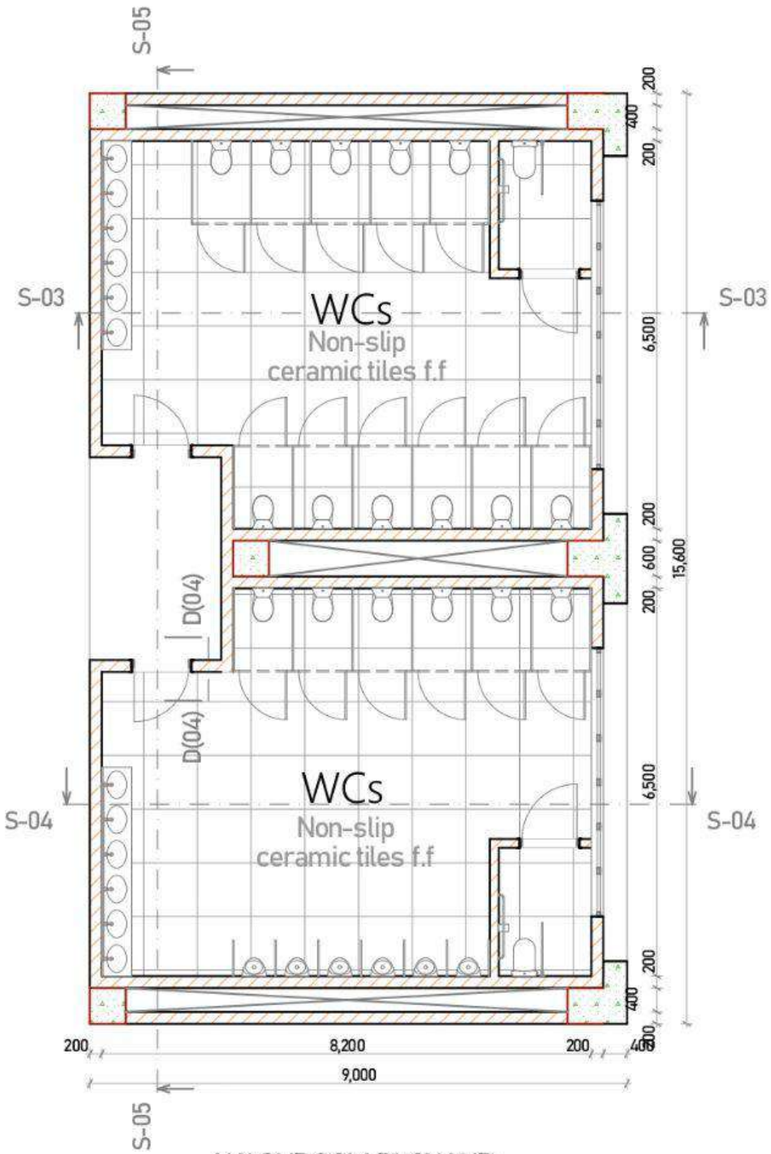
4. Branded and identifiable. The elevations play a key role to users in establishing the brand identity and creating a memorable first impression. The colours are inspired by the traditional Kikuyu colours and comprise earth tones that make it relatable to nature.

5. Sustainable in terms of passive strategies. The elevations incorporate passive design strategies including building form, strategic window placement and strategic material selection.

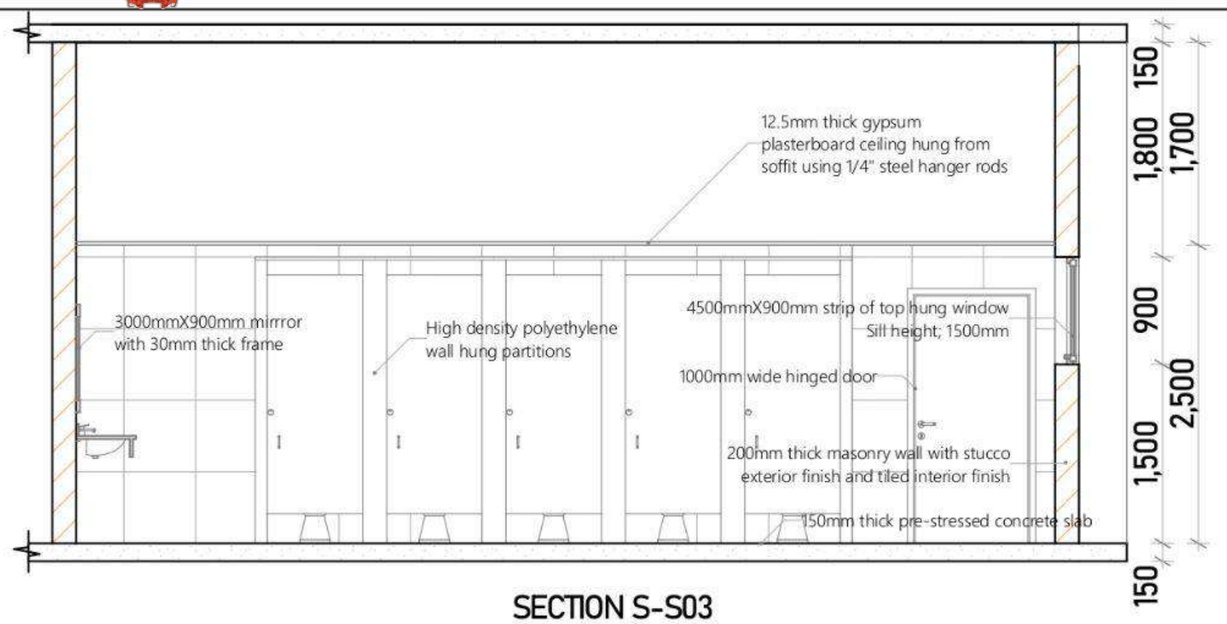
6. Easy to navigate. The elevations have a clear delineation of entrances and functional zones. This ensures improved pedestrian flow around the building and ease of wayfinding.

SECTION S-S01
SCALE 1:200

SECTION S-S02
SCALE 1:200



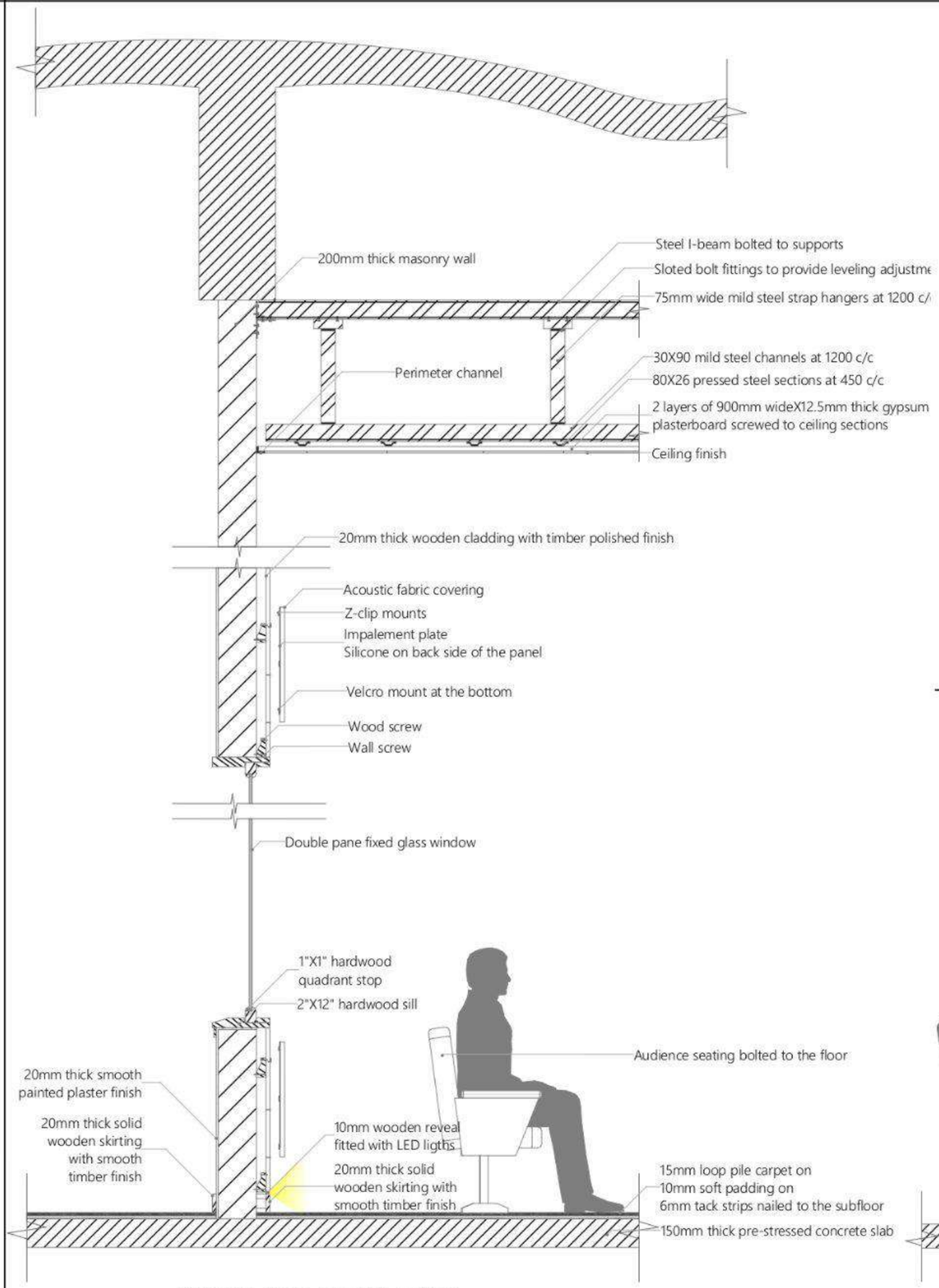
WASHROOM BLOW UP
SCALE 1:50



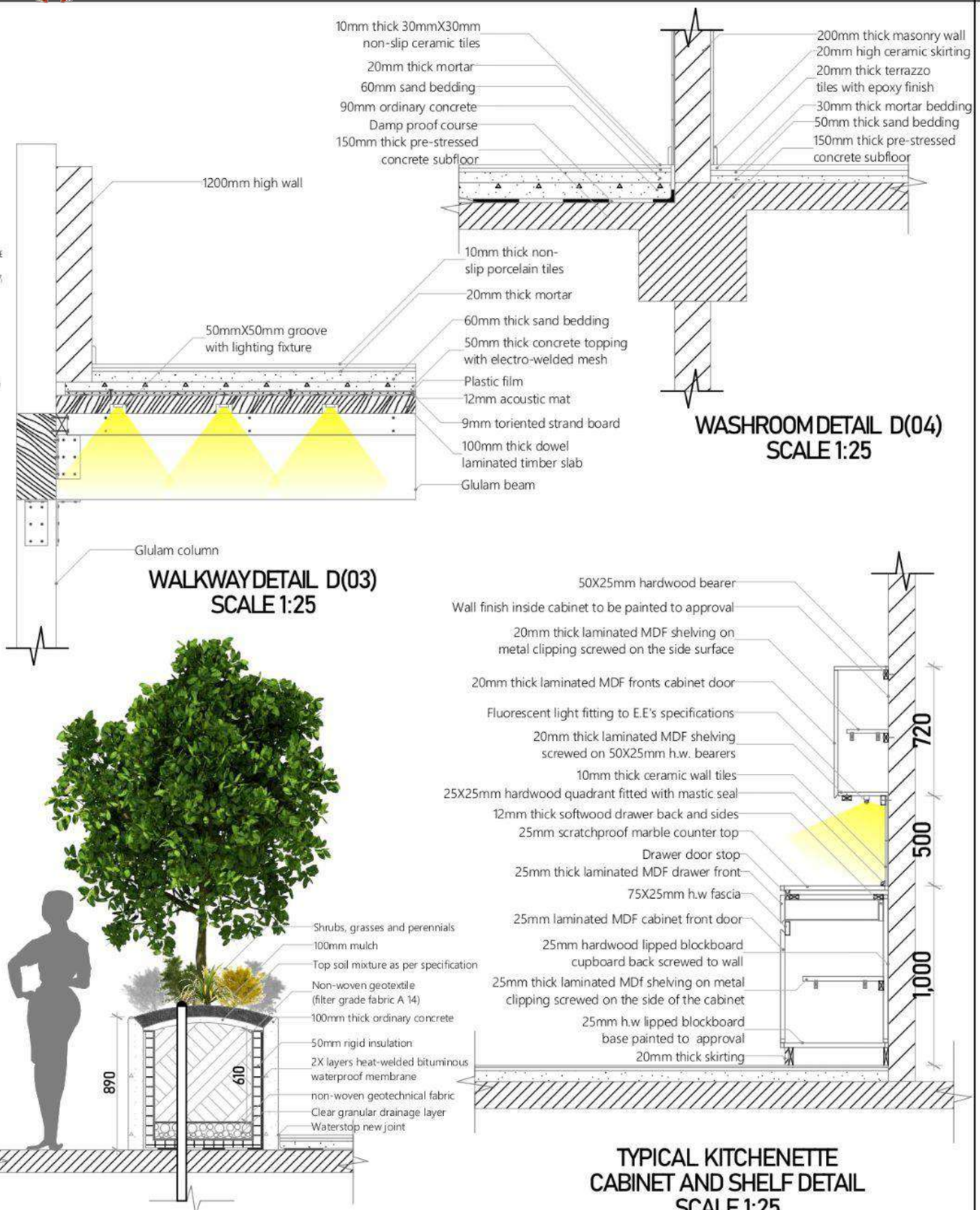
SECTION S-S03
SCALE 1:50

SECTION S-S04
SCALE 1:50

SECTION S-S05
SCALE 1:100



CINEMA HALL DETAIL D(02)
SCALE 1:25



WALKWAY DETAIL D(03)
SCALE 1:25

WASHROOM DETAIL D(04)
SCALE 1:25

TYPICAL CONCRETE PLANTER DETAIL
SCALE 1:25

TYPICAL KITCHENETTE
CABINET AND SHELF DETAIL
SCALE 1:25

PROJECT PRESENTATION & CONCEPT

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.

COLLINS SHAMALA
DEPARTMENT OF ARCHITECTURE AND INTERIOR DESIGN (DAID)
FACULTY OF ENGINEERING AND ARCHITECTURE (SEA)
KENYATTA UNIVERSITY
maikuvacollin@gmail.com

BIOGRAPHY

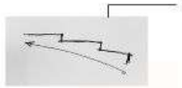
Collins Maikuva Shamala is a Kenyatta University architecture student who is anticipated to graduate in 2026. He gained significant experience during his attachments at the NCA Research Department and the NCA Nairobi Regional Office. He worked with NCA Research on several high-profile projects, such as the Center for Construction Industry Development in Konza Technopolis, and designed a proposed medical dispensary in Kisii County. Creating the Online Research Portal proposal and planning the Annual Construction Research and Innovation Dissemination Forum were also some of his noteworthy responsibilities. At the Nairobi office, He assisted with quality control, accreditation, and IT maintenance, in the day-to-day enforcement of NCA's construction regulations.

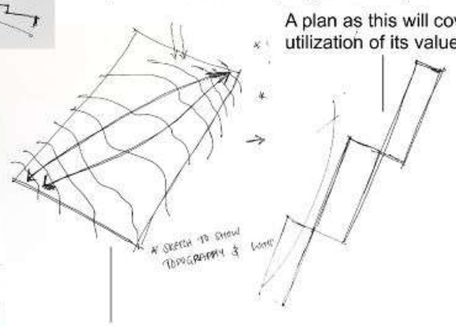
Concept: Renasence; To restore, replenish.
Tigoni site has a historical background of colonial oppression of land owners within and its neighbourhood. Land grabbing by settlers is one of the poking feature of this background.

To date, land owners have not been able to reclaim their land fully, and so is their economical and political autonomy. This project soughts to contribute towards solving this by creating a hub for economical empowerment to the locals and even migrants.

Concept & Plan ↓

Since architecture is visual, renasence can be represented as shown; *to gain and improve*.



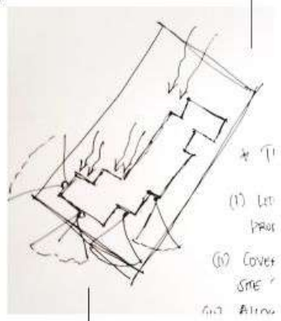


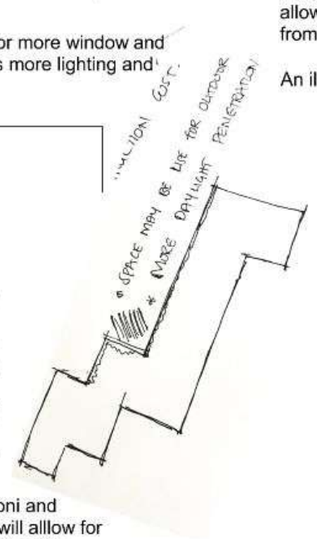
A plan as this will cover more site area thus full utilization of its value.

Visualising the site enables one to appreciate its terrain as a stand out feature.

The site is also vast, 100mx200m, and properly utilizing economically it is a priority too.

This plan type also allows for more window and envelope surface area, thus more lighting and quality of interior spaces.





Studying the wind direction of tigoni and precisely orienting this plan type will alllow for better ventilation considering this is a full fledged mall.

This plan also allows for proper anchorage of the mall; having the anchor stores at furthers ends and allowing them to be as expansive as possible free from the main mall structure rigidity.

An illustration of the mall plan after design.

An illustration of the mall plan after design.

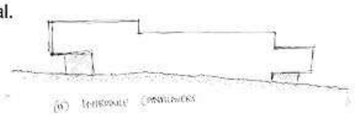
Project Introduction

Project Choice: Mall Design, Tigoni.

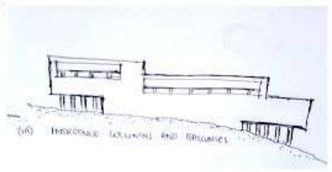
Reasons For Choice:

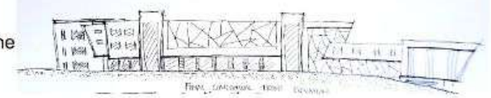
1. Tigoni site is expansive and far from possible mall competition.
2. The demographic around Tigoni composes of working employed population market for the comercial development.

2. The design will have cantilevers to increase the usable space sunken due to terrain thus avoid waste and more aesthetic.



3. Columns are incoporated to support the hanging slabs due to terrain, if any.





A sketch of the final design Front elevation.

A sketch of the final design Rear elevation.

Concept & Elevations ↓

Owing to the concept, elevations can be designed to be interesting and fungtional.

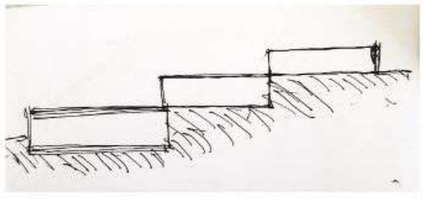
1. By default the stepping will fit Tigoni's terrain.

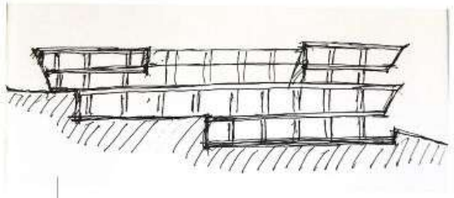
However the basements will be put in a manner that there is minimal escavation and fill.

Concept & Sections ↓

The same concept is used in section.
The design will have two basements due to site slope elevation being over 6 metres.

The design will attempt to have direct access to either basement without ramps to be more economical.





Sections and Perspectives of Final Design. ↓

Some of the advantages of this design approach have been shown below;

Reg No:	B11/0603/2020
Project Location:	Tigoni, Limuru.
Student Name:	Collins Shamala.
Project Type:	Commercial: Mall.

MALL DESIGN: TIGONI

GROUND FLOOR PLAN

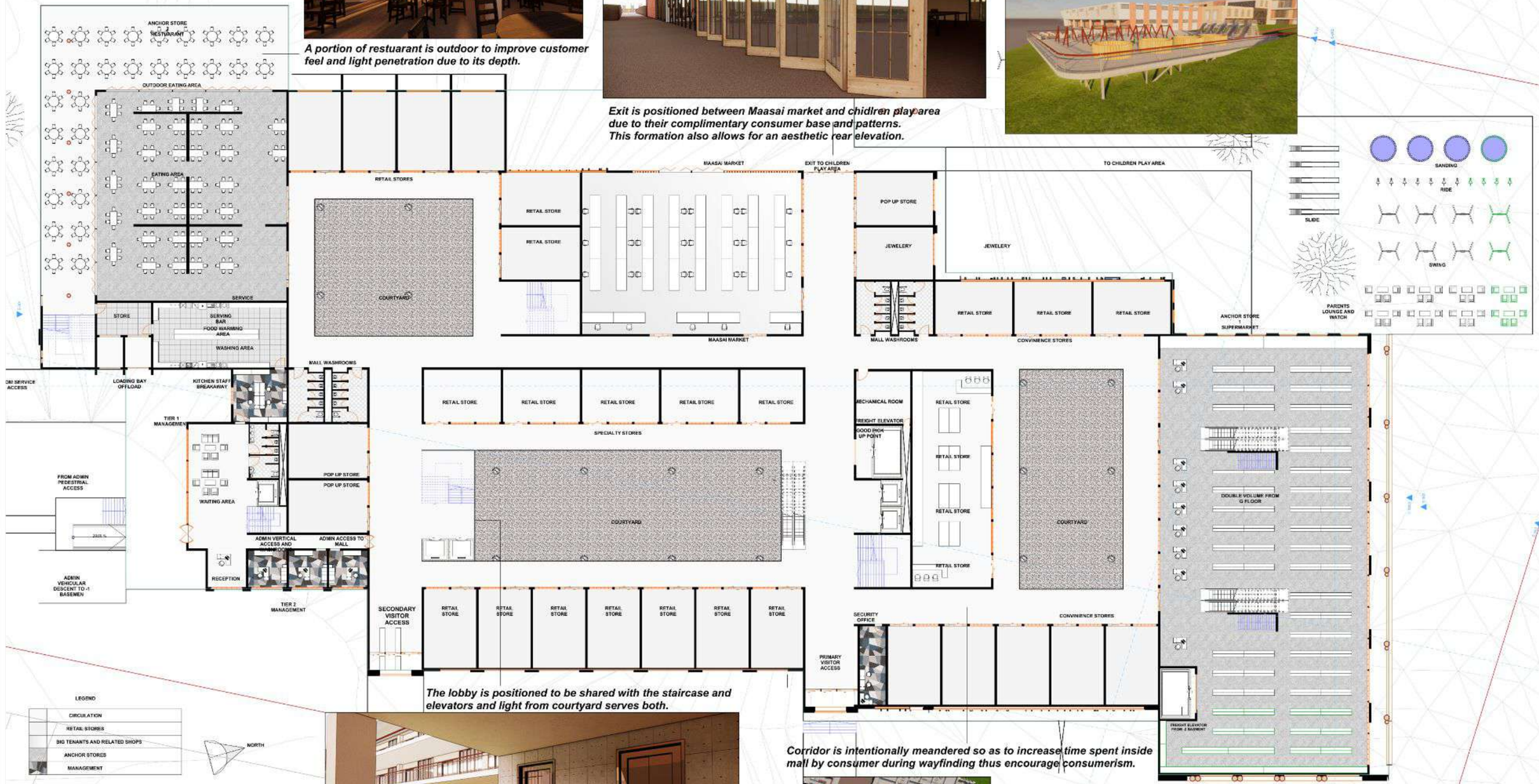
PRESENTATION DRAWINGS

	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	Client:	Actis Capital.
Sign:				Architect:	TheFiveTime.
				Contractor:	Tiglath Works & Co.

A portion of restuarant is outdoor to improve customer feel and light penetration due to its depth.

Exit is positioned between Maasai market and chidlren play area due to their complimentary consumer base and patterns. This formation also allows for an aesthetic rear elevation.

Children play area incorporates a parent sitting area so as to allow supervision of their kids, thus more assuarance of safety and confidence to use the facility.



The lobby is positioned to be shared with the staircase and elevators and light from courtyard serves both.

Corridor is intentionally meandered so as to increase time spent inside mall by consumer during wayfinding thus encourage consumerism.

SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	P/02	RDNA NAIROBI

MALL DESIGN: TIGONI

FIRST FLOOR PLAN

PRESENTATION DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.

Vertical sunshading is used to reduce glare in these retail spaces considering they have full glass facades.

Interior walls to be utilized for advertisement and wayfinding instead of having the facade to house these.

Theatre hall is suits light deprived section of the mall and its supporting auxilliary businesses are situated around it.

Supermarket's elevation is improved by having opposing cantilevers and recessions.

The staff offices are connected to the chefs' breakaway and the kitchen to allow easy access to work and rest for staff. The staff also has room to prep before commiting to work.

Tier 1 management are given the privilledge of a balcony.

The corridor is supported by cantilevers anchored to home columns so as to prevent beams spanning through the courtyard.

Configuring corridors in a way by having mirrored spaces to have natural lighting as opposed to having them between spaces and lack lighting and ventilation.

SHEET DATA

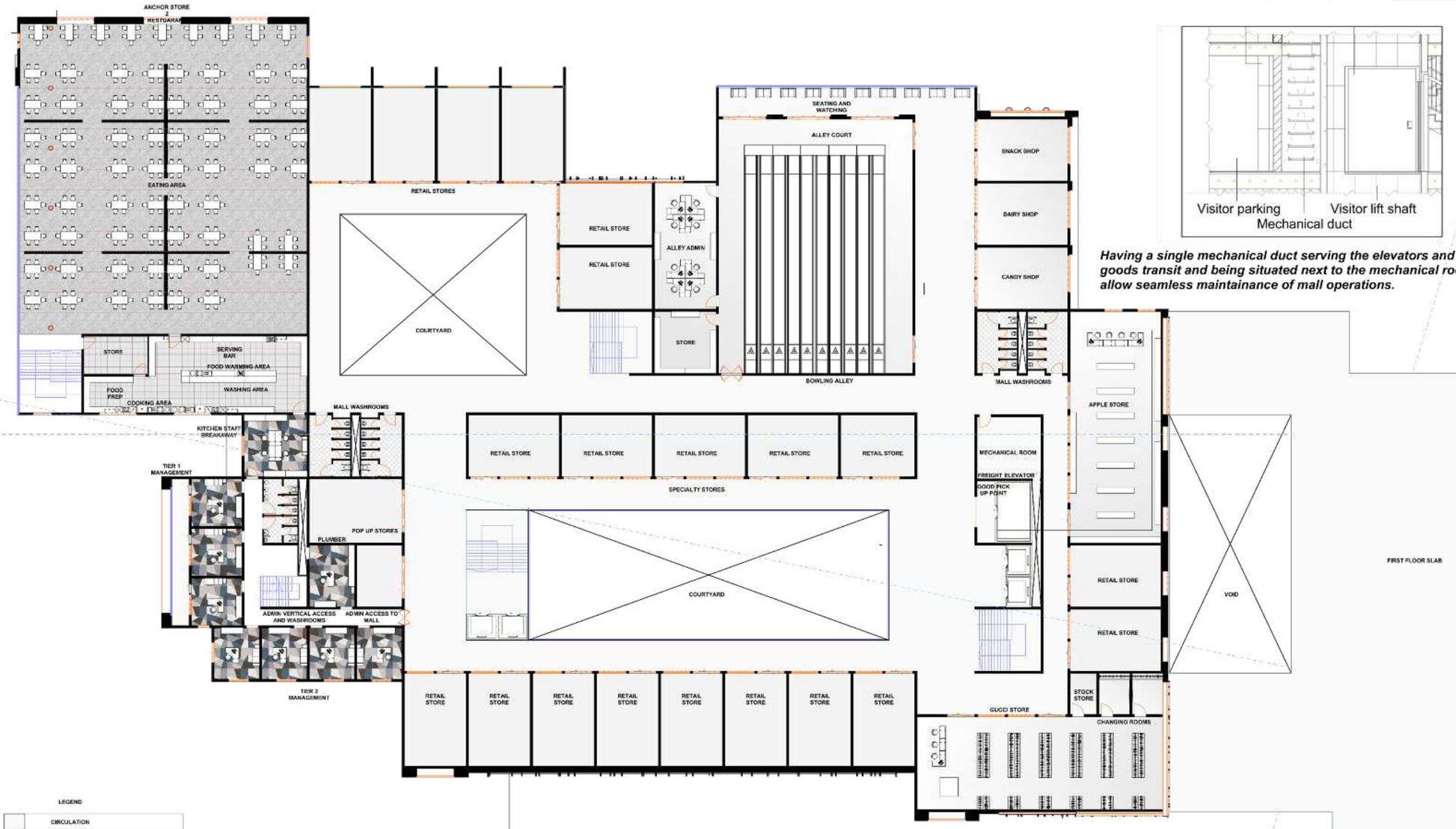
Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	P/03	RDNA SEMINARS

MALL DESIGN: TIGONI

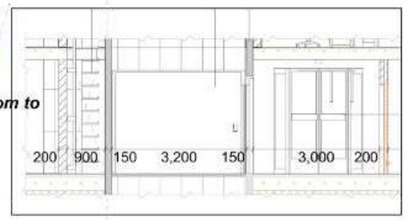
SECOND FLOOR PLAN

PRESENTATION DRAWINGS

	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	Client:	Actis Capital.
Sign:				Architect:	TheFiveTime.
				Contractor:	Tiglath Works & Co.



Having a single mechanical duct serving the elevators and goods transit and being situated next to the mechanical room to allow seamless maintainance of mall operations.

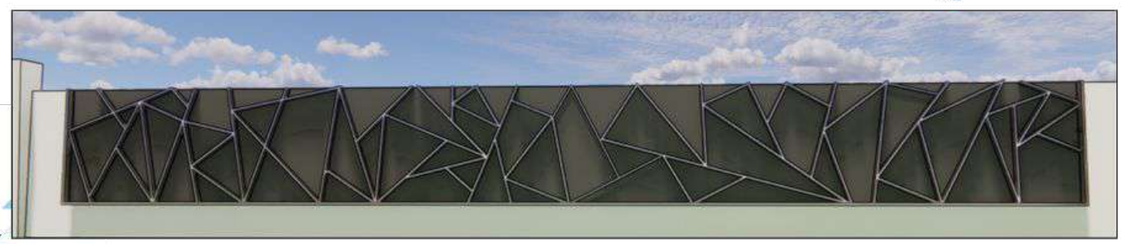


LEGEND

- CIRCULATION
- RETAIL STORES
- BIG TENANTS AND RELATED SHOPS
- ANCHOR STORES
- MANAGEMENT

NORTH

Having a curtain wall is justified for a mall, since it allows daylight penetration with filtering and a touch of aesthetics to potential customers.



Having a partial second floor level is justified since building's plot ratio has already been utilized by having 2nd basement due to site's terrain.

SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	P/04	RDNA SHAMALA

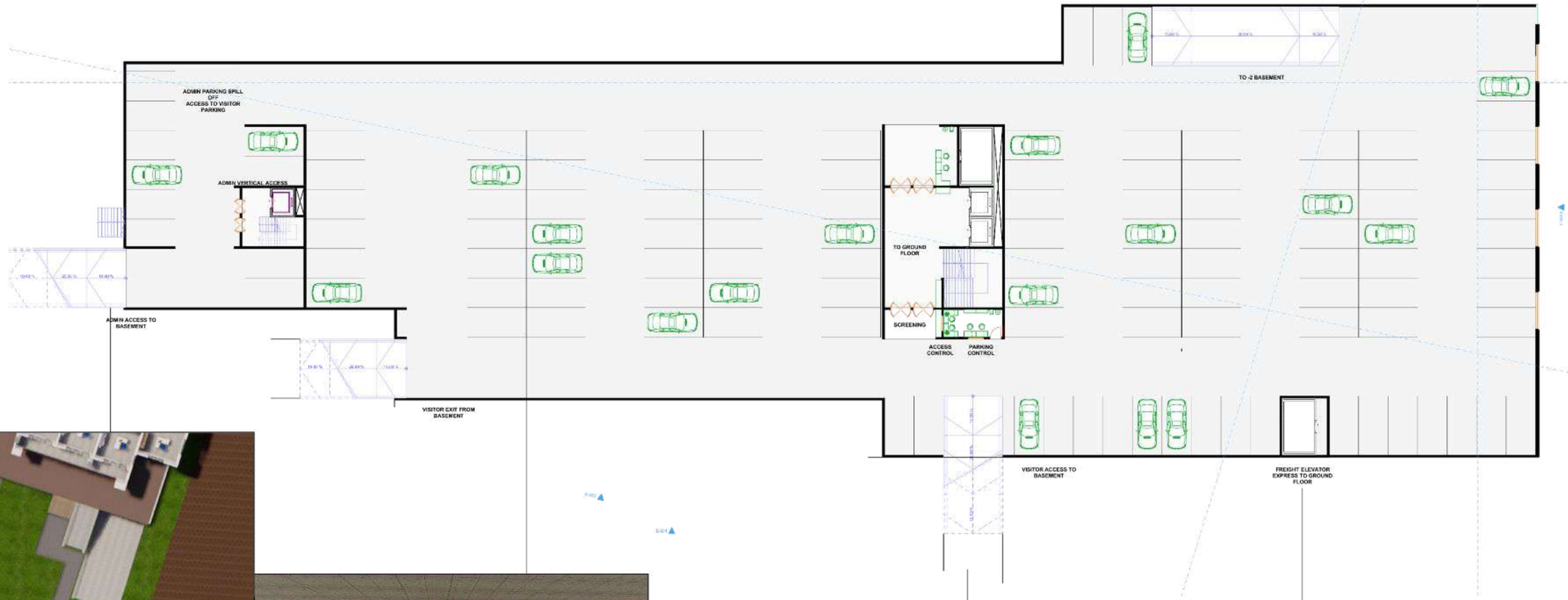
MALL DESIGN: TIGONI

-1 BASEMENT PLAN

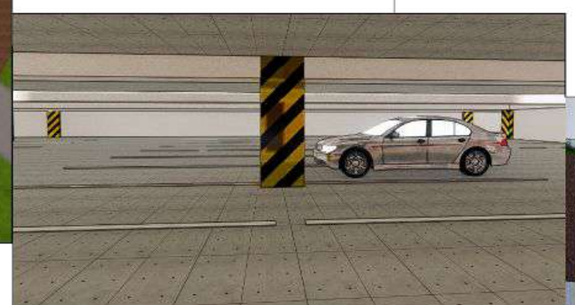
PRESENTATION DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.



The admin parking is separeted from visitor parking but there is allowance incase of a spilloff.



Having the columns positioned in the axis of a mirrored parking so as to allow easy maneuver of vehicles.

The parking control is situated in a manner to allow monitoring of any vehicles accesing the basement and their guidance.

The supermarket goods transit elevator is express to ground floor and inaccessible on this basement.

The main goods transit elevator is express to ground floor too, thus their is a screening booth positioned to allow access to core via 2 ways.

SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	P/05	RDNA SHAMALA

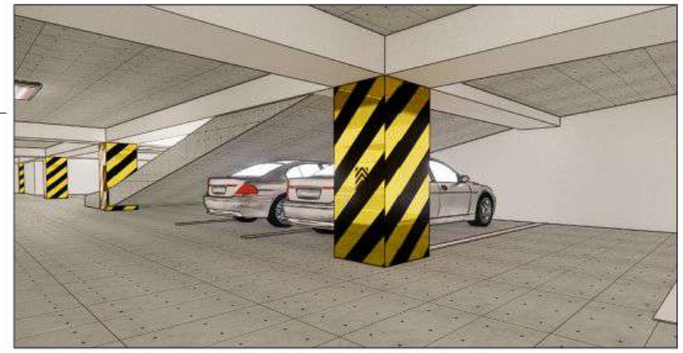
MALL DESIGN: TIGONI

-2 BASEMENT PLAN

PRESENTATION DRAWINGS

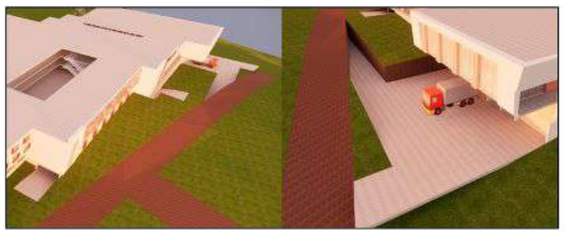
	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.

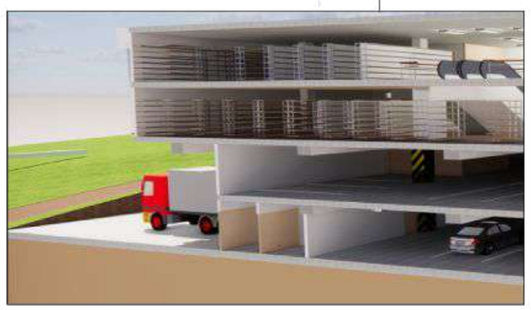


Sedan parking situated under ramp for maximum developed space utilisation.

A mesh is used to flyproof and allow light penetration to the basement.



Due to nature of site and its terrain, it is not economical to have identical basements rather those which fit the slope.



Truck offload is situated at periphery so as to prevent entry and maneuver problems had it been positioned near core.

The supermarket is supported by cantilevered beams anchored to columns at desired locations which allow truck maneuver.

SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	P/06	RDNA SHAMALA

MALL DESIGN: TIGONI

ELEVATIONS

PRESENTATION DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.

FRONT ELEVATION

REAR ELEVATION

SIDE ELEVATIONS

SUPERMARKET

RESTUARANT

PARKING AND ACCESS CONTROL

SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	P/07	

MALL DESIGN: TIGONI

GROUND FLOOR PLAN 1:200

WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	Client:	Actis Capital.
Sign:				Architect:	TheFiveTime.
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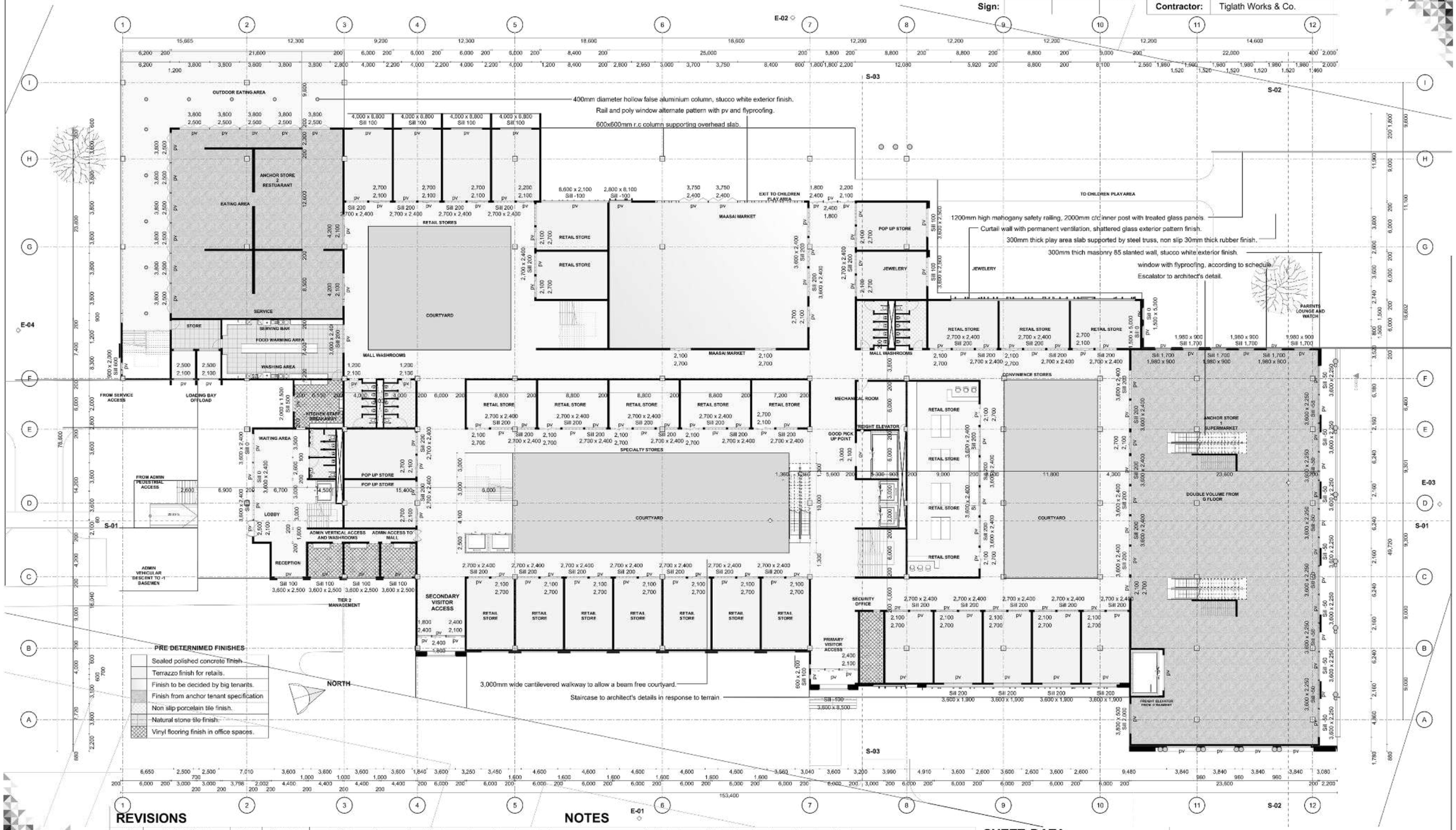

PRE DETERMINED FINISHES

- Sealed polished concrete finish
- Terrazzo finish for retails.
- Finish to be decided by big tenants.
- Finish from anchor tenant specification
- Non slip porcelain tile finish.
- Natural stone tile finish.
- Vinyl flooring finish in office spaces.

REVISIONS

No.	Proffessional	Date	Remarks

NOTES

1. All dimensions are in milimetres unless otherwise stated.
2. Read only figured dimensions.
3. P.v denotes permanent ventilation and must be provided above all openings where indicated.
4. All walls to be reinforced with hoop iron after every alternating course.
5. All r.c works to structural engineer's details.
6. All levels are finished levels unless otherwise stated.
7. Depth of foundations trenches determined on site must be atleast 600mm below ground level.
8. D. p. c denotes dump proof course and must be of bituminous felt placed under every wall and must be atleast 150mm above ground.
9. Scales used are 1:200 & 1:10, indicated to the respective drawings..

SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	W/01	RDNA SHAMALA

MALL DESIGN: TIGONI

FIRST FLOOR PLAN 1:200

WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	Client:	Actis Capital.
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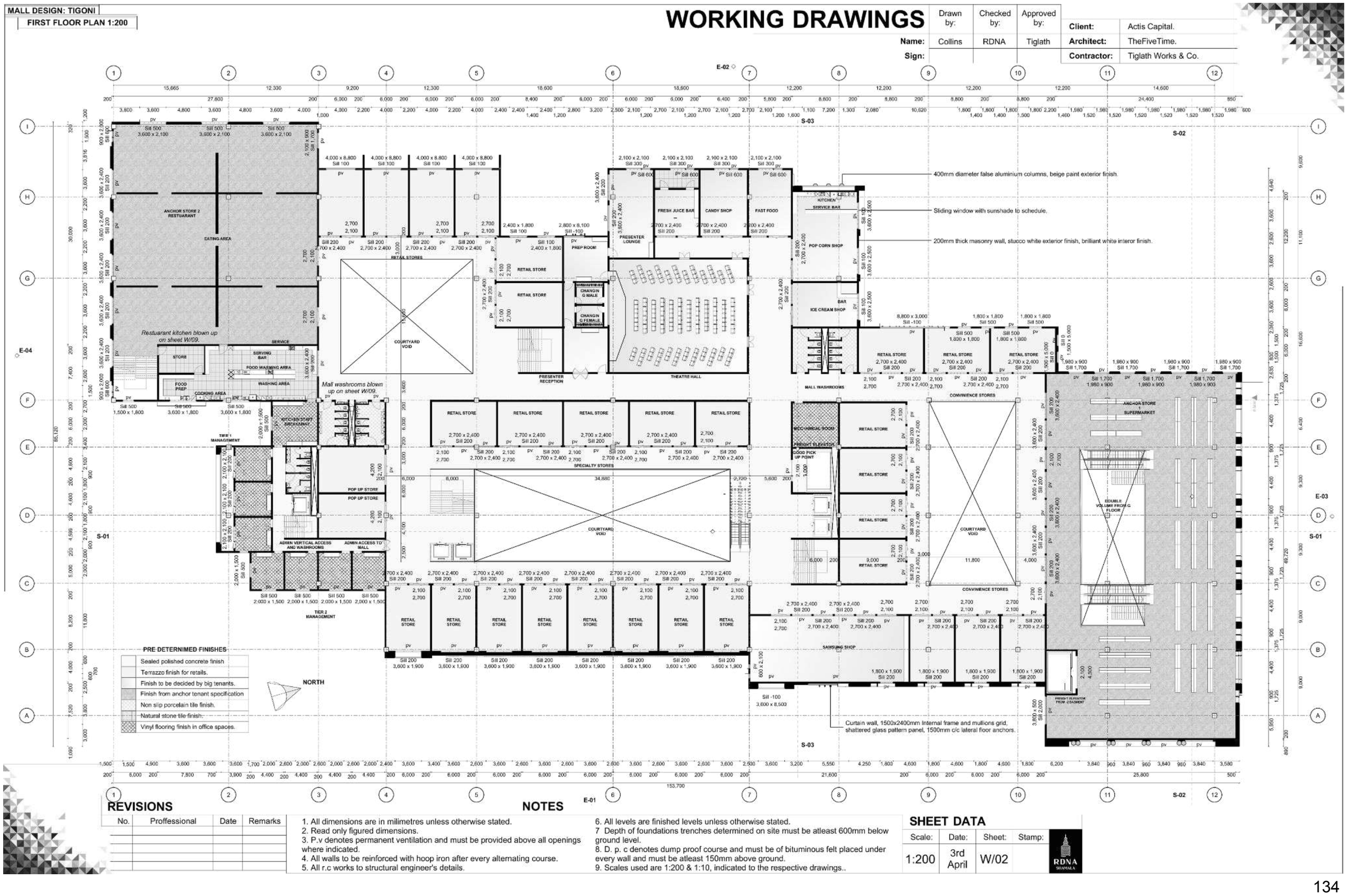

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SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	W/02	RDNA SEMAKALA

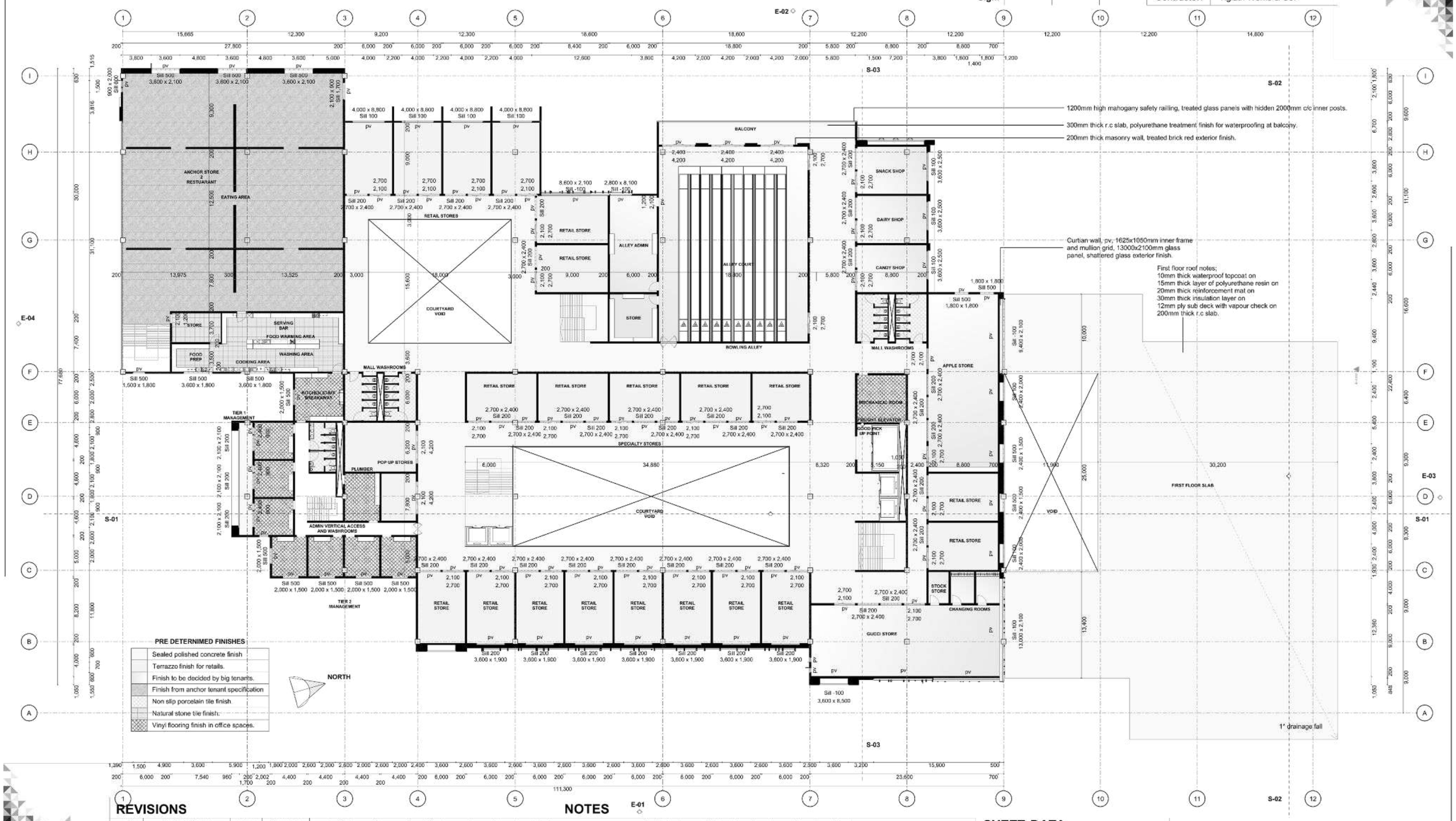
MALL DESIGN: TIGONI

SECOND FLOOR PLAN 1:200

WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.



PRE DETERNIMED FINISHES

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	Terrazzo finish for retails.
	Finish to be decided by big tenants.
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	Non slip porcelain tile finish.
	Natural stone tile finish.
	Vinyl flooring finish in office spaces.

REVISIONS

No.	Proffessional	Date	Remarks

NOTES

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9. Scales used are 1:200 & 1:10, indicated to the respective drawings..

SHEET DATA

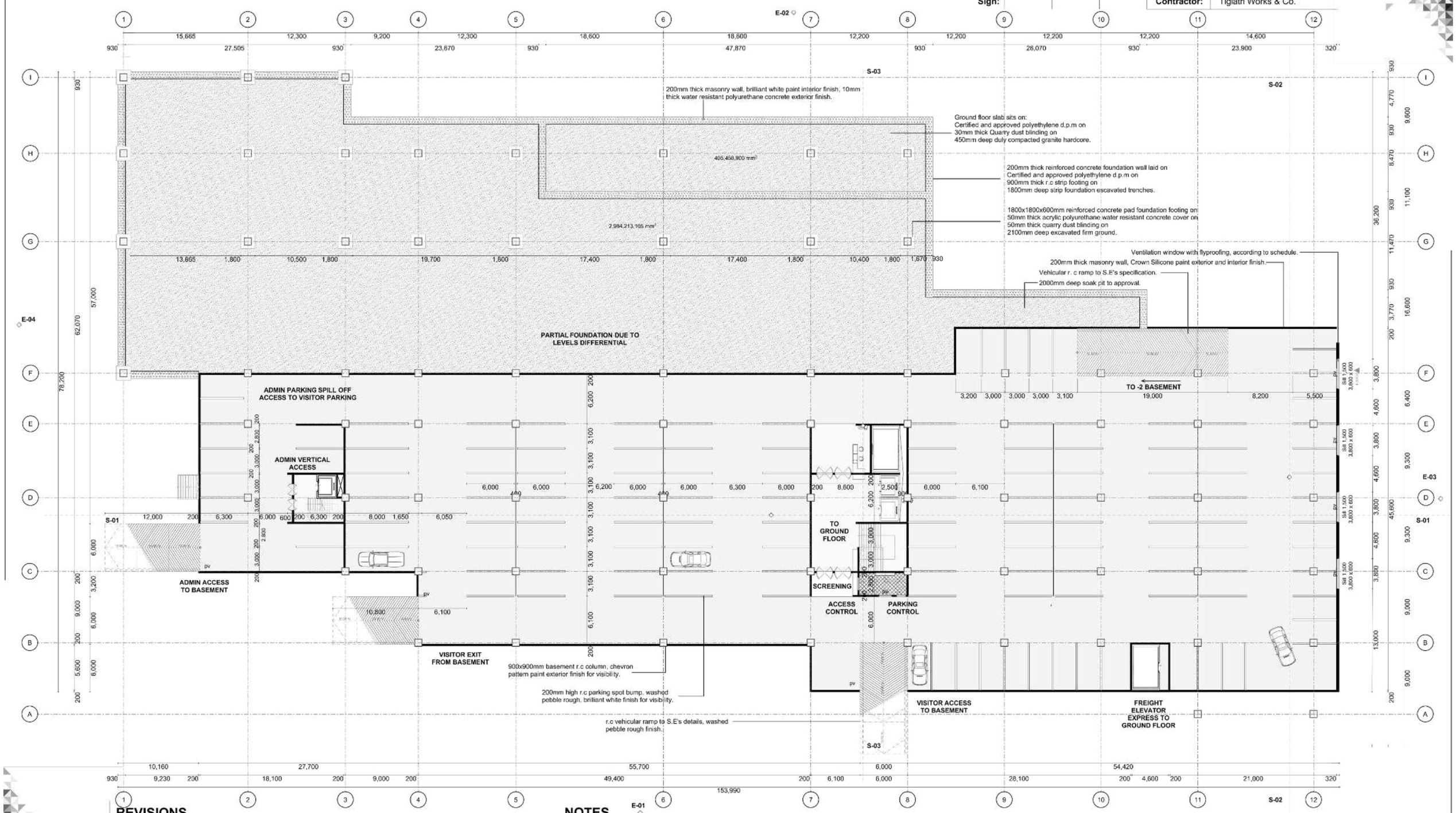
Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	W/03	RDNA SEAMALA

MALL DESIGN: TIGONI

-1 BASEMENT PLAN 1:200

WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	Client:	Actis Capital.
Sign:				Architect:	TheFiveTime.
				Contractor:	Tiglath Works & Co.



REVISIONS

No.	Proffessional	Date	Remarks

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SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	W/04	RDNA SHAMALA

MALL DESIGN: TIGONI

-2 BASEMENT PLAN 1:200

WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.

Door Schedule

Library Part Name	Door 25	Door 25	Door 25	Door 25	Double Door 25	Exterior Sliding Doo...	Revolving Door 25	Revolving Door 25	Revolving Door 25	Sliding Door with 2 ...	Sliding Door with 2 ...	Sliding Door with 2 ...	Sliding Door with 2 ...	Sliding Door with 2 ...	Sliding Door with Tr...	Sliding Folding Mult...	Sliding Folding Mult...	Vertical Sliding Gar...	Vertical Sliding Gar...
Quantity	1	6	82	61	4	6	2	3	10	1	2	3	6	106	6	2	11	1	3
W x H Size	700×2,100	900×2,100	800×2,100	1,200×2,100	1,600×2,100	900×2,400	1,800×2,400	1,600×2,100	2,100×2,500	2,200×2,100	2,400×2,100	4,200×2,400	4,200×2,100	2,700×2,100	1,800×2,400	3,700×2,400	3,600×2,500	5,600×2,100	4,500×2,100
Head height	2,100	2,100	2,100	2,100	2,100	2,400	2,400	2,100	2,500	2,100	2,100	2,400	2,100	2,100	2,400	2,400	2,500	2,100	2,100
2D Symbol																			
3D Back View																			
Fire Resistance Ratin...	<Undefined>	<Undefined>	45 minutes	<Undefined>	30 minutes	45 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	1 hour	1 hour	1 hour	45 minutes	1 hour

Window Schedule

Opening Name	3-Sash Sliding Win...	3-Sash Sliding Win...	3-Sash Sliding Win...	4-Sash Sliding Win...	4-Sash Sliding Win...	4-Sash Sliding Win...	4-Sash Sliding Win...	4-Sash Sliding Win...	4-Sash Sliding Win...	6-Sash Sliding Win...	6-Sash Sliding Win...	6-Sash Sliding Win...	6-Sash Sliding Win...	6-Sash Sliding Win...	6-Sash Sliding Win...	5-Sash Sliding Win...	6-Sash Sliding Win...	Vertical Multi-Sash	Vertical Multi-Sash	Vertical Multi-Sash	Vertical Multi-Sash	Vertical Multi-Sash	Window 25	Window 25	Window 25	Window 25	Window 25	Window 25	Window 25	Window 25
Quantity	4	6	18	2	2	4	6	13	1	3	4	6	12	13	28	112	2	2	3	4	4	1	1	1	1	1	1	1	1
W x H Size	1,800×1,800	1,800×1,800	3,600×1,800	2,400×1,500	2,400×1,800	2,100×2,100	2,100×2,100	2,000×1,500	2,200×2,400	3,600×2,400	3,600×2,400	3,600×2,100	3,600×2,500	3,600×2,250	3,600×2,400	2,700×2,400	1,200×2,000	1,500×1,800	2,400×2,000	1,200×2,000	900×2,100	13,000×2,100	2,600×8,100	23,220×3,000	24,000×2,400	39,494×2,500	600×2,100	7,200×5,100	7,600×8,100
Sill height	300	600	300	600	200	400	300	600	300	600	600	600	200	50	300	300	200	600	200	700	200	0	0	0	0	0	600	-200	0
Head height	2,200	2,400	2,200	2,100	2,000	2,500	2,400	2,100	2,700	2,500	2,400	2,700	2,700	2,300	2,700	2,700	2,200	2,400	2,200	2,700	2,300	2,100	8,100	3,000	2,400	2,500	2,700	4,800	8,100
2D Symbol																													
3D Back View																													
Fire Resistance Rating	<Undefined>	<Undefined>	<Undefined>	45 minutes	45 minutes	45 minutes	30 minutes	45 minutes	30 minutes	30 minutes	45 minutes	30 minutes	45 minutes	45 minutes	30 minutes	30 minutes	20 minutes	45 minutes	20 minutes	20 minutes	<Undefined>	30 minutes	30 minutes	30 minutes	30 minutes	30 minutes	<Undefined>	45 minutes	45 minutes

930 | 12,300 | 9,200 | 12,300 | 18,600 | 18,600 | 12,200 | 12,200 | 12,200 | 12,200 | 14,600 — 76,850 | 200 | 4,400 | 200 | 7,400 | 200 | 5,800 | 200 | 48,320

E-04

200mm thick masonry wall, brilliant white paint interior finish, 10mm thick water resistant polyurethane concrete exterior finish.

2,267,532.144 m²

RETAIL STORES STORAGE | RETAIL STORES GOODS DROP POINT | FORKLIFT PARKING | FREIGHT ELEVAT... | GOODS DISBURSEMEN T PREP AND PATCH | Main core blown up on sheet W/08. | TO GROUND FLOOR | SCREENING | ACCESS CONTROL | PARKING CONTROL | FROM -1 BASEMENT

930 | 26,650 | 930 | 49,180 — 41,430 — 24,070

200mm thick reinforced concrete foundation wall laid on Certified and approved polyethylene d.p.m on 900mm thick r.c strip footing on 1800mm deep strip foundation escavated trenches.

1800x1800x600mm reinforced concrete pad foundation footing on 50mm thick acrylic polyurethane water resistant concrete cover on 50mm thick quarry dust blinding on 2100mm deep excavated firm ground.

-1 Basement slab sits on: Certified and approved polyethylene d.p.m on 30mm thick Quarry dust blinding on 450mm deep duly compacted granite hardcore.

900x900mm r.c column, chevron pattern exterior paint finish for visibility.

S-03

SUPERMARKET GOODS ELEVATOR | RETAILS STORES GOODS FORKLIFT PICKUP | GOODS TRANSIT PREP AND PATCH | FREIGHT OFFLOAD | SUPERMARKET STORAGE | TRUCK CLEARANCE | TRUCK ACCESS

40,190 — 51,640 — 66,720

S-01 | S-02 | E-01 | E-03

REVISIONS

No.	Proffessional	Date	Remarks

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SHEET DATA

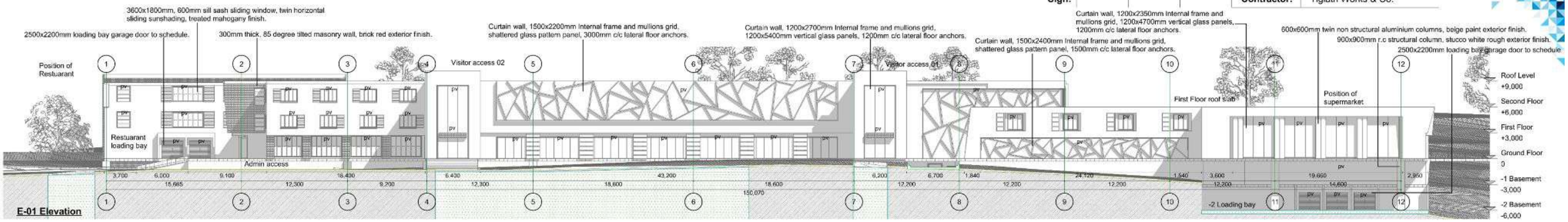
Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	W/05	RDNA SHAMALA

MALL DESIGN: TIGONI

ELEVATIONS 1:200

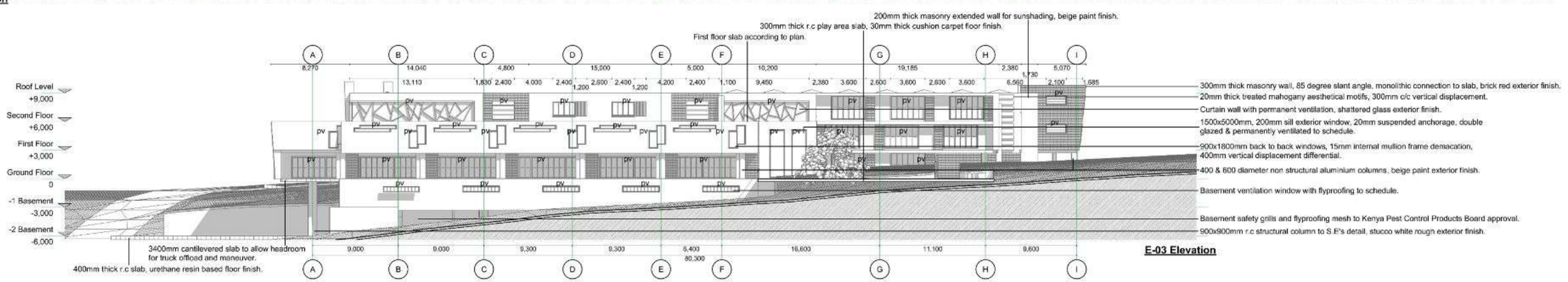
WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	**Client:**	Actis Capital.
Sign:				**Architect:**	TheFiveTime.
				Contractor:	Tiglath Works & Co.



E-01 Elevation

E-02 Elevation



E-03 Elevation

E-04 Elevation

REVISIONS

No.	Proffessional	Date	Remarks

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SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	3rd April	W/06	RDNA SHAMBA

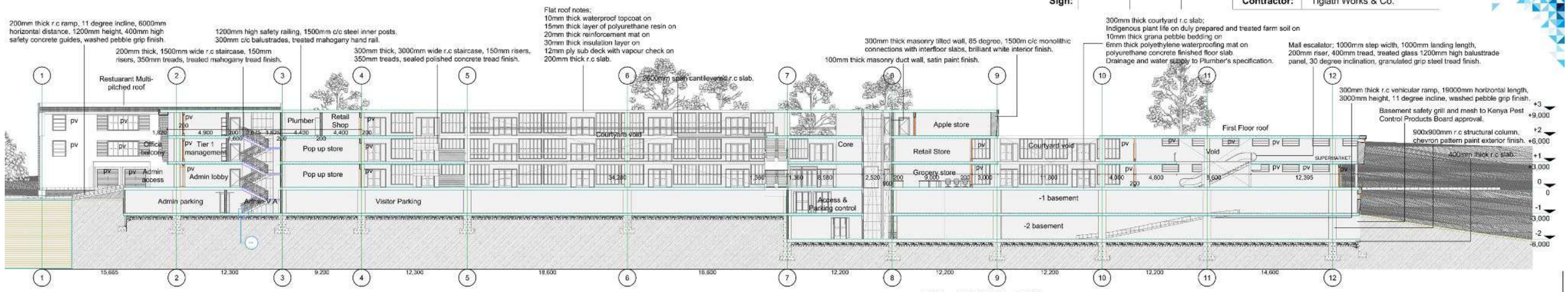
MALL DESIGN: TIGONI

SECTIONS 1:200 DETAILS 1:20

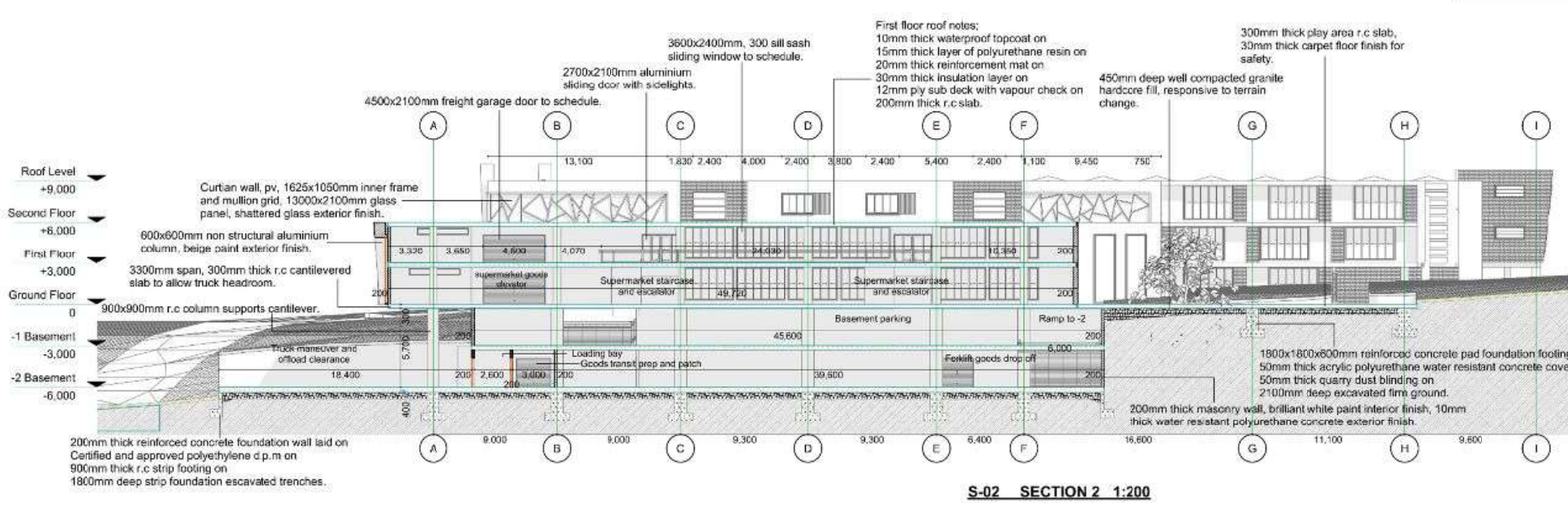
WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

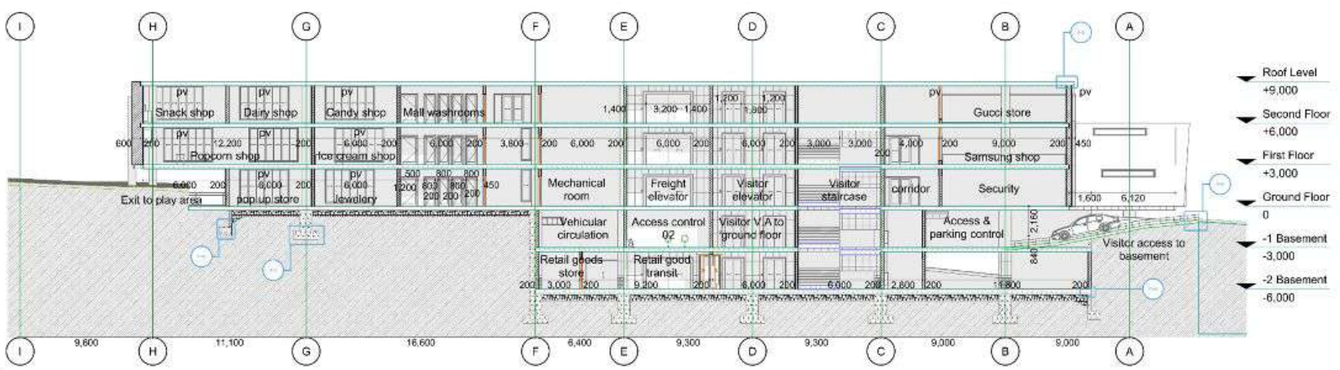
Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.



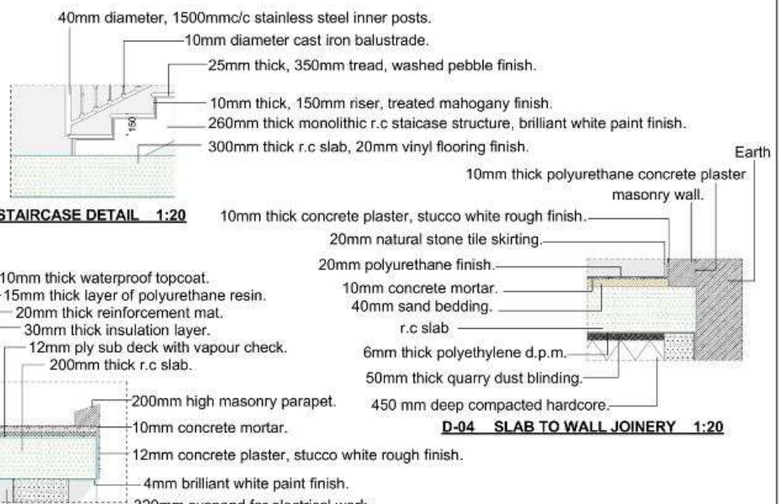
S-01 SECTION 1 1:200



S-02 SECTION 2 1:200



S-03 SECTION 3 1:200



D-01 STAIRCASE DETAIL 1:20

D-04 SLAB TO WALL JOINERY 1:20

D-02 FLAT ROOF DETAIL 1:20

D-05 PAD FOUNDATION DETAIL 1:20

D-03 STRIP FOUNDATION DETAIL 1:20

D-06 VEHICULAR RAMP DETAIL 1:20

REVISIONS

No.	Proffessional	Date	Remarks

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SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:200	6th April	W/07	RDNA SHAMALA

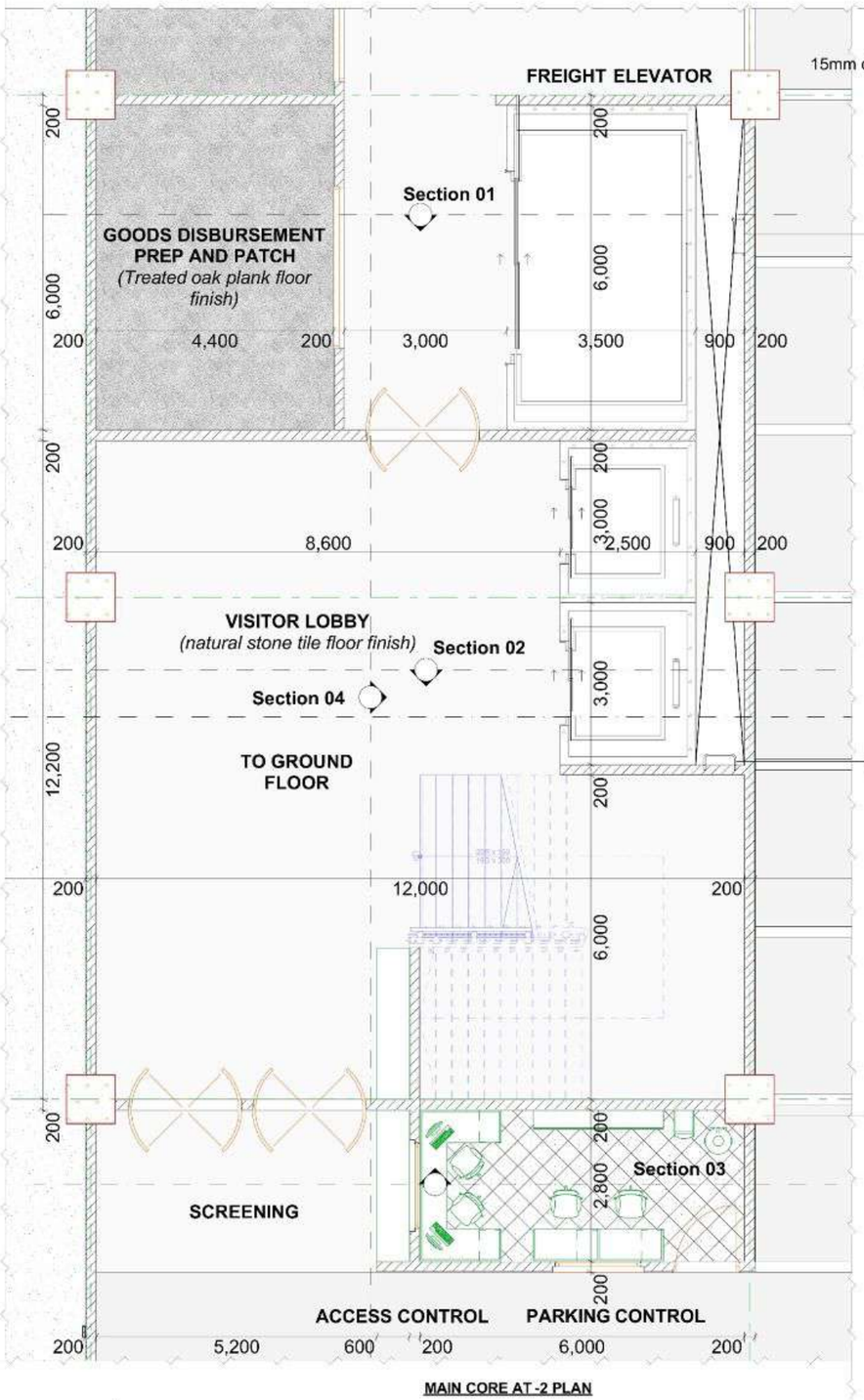
MALL DESIGN: TIGONI

MAIN CORE AT -2 BLOW UP

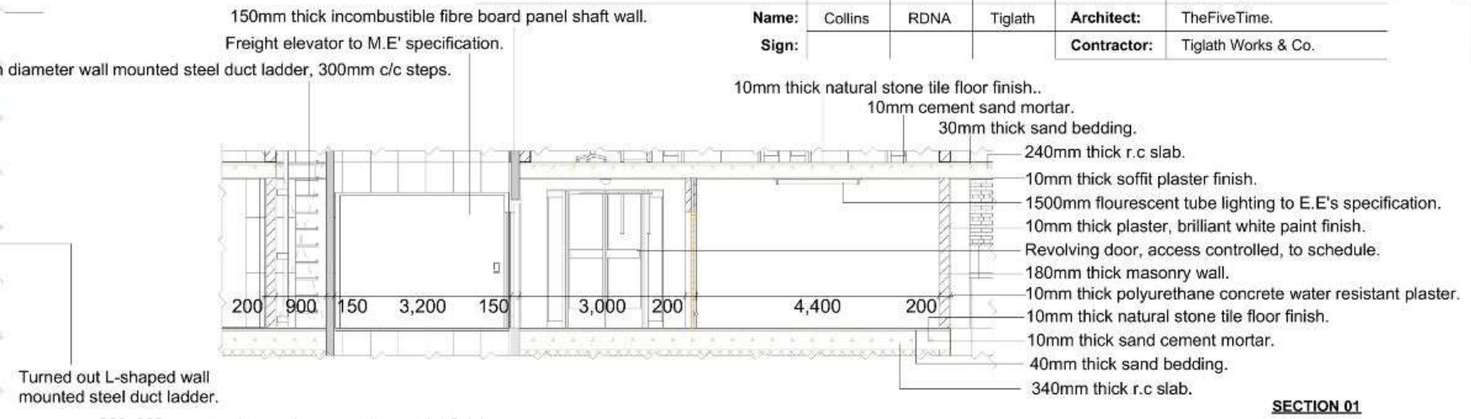
WORKING DRAWINGS

	Drawn by:	Checked by:	Approved by:
Name:	Collins	RDNA	Tiglath
Sign:			

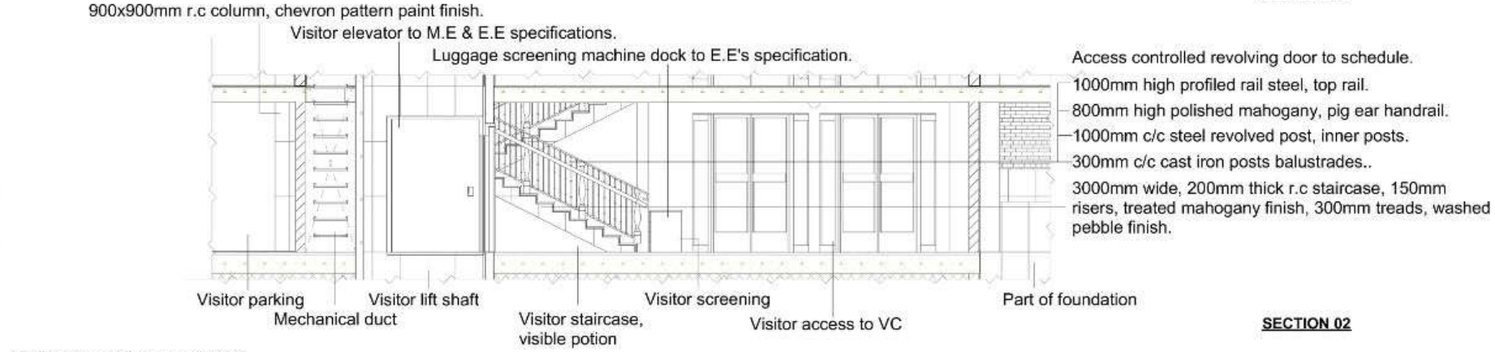
Client:	Actis Capital.
Architect:	TheFiveTime.
Contractor:	Tiglath Works & Co.



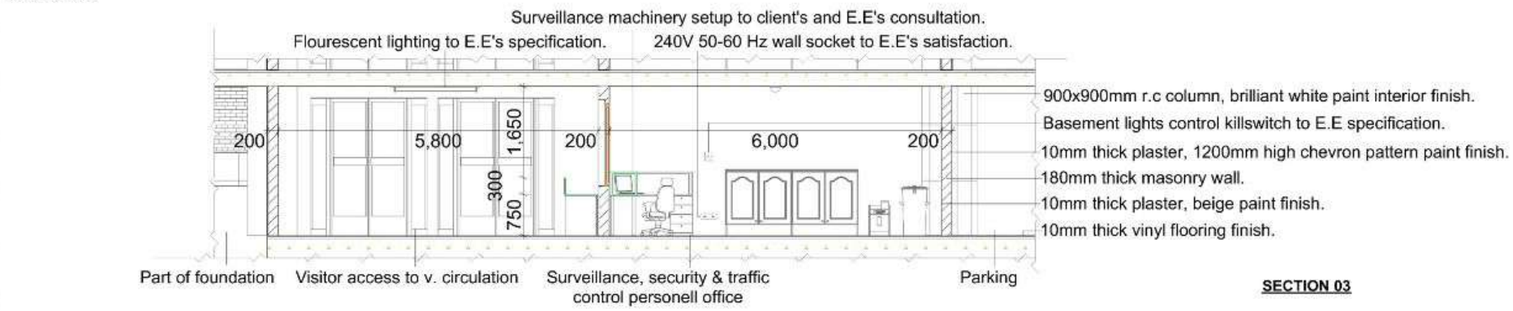
MAIN CORE AT -2 PLAN



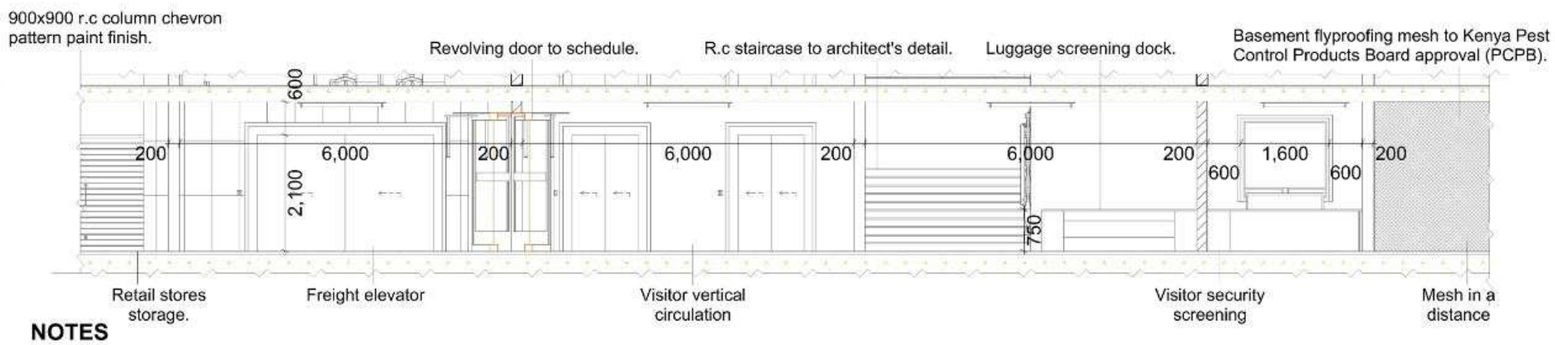
SECTION 01



SECTION 02



SECTION 03



SECTION 04

REVISIONS

No.	Proffessional	Date	Remarks

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9. Scale used is 1:50, indicated to the respective drawings..

SHEET DATA

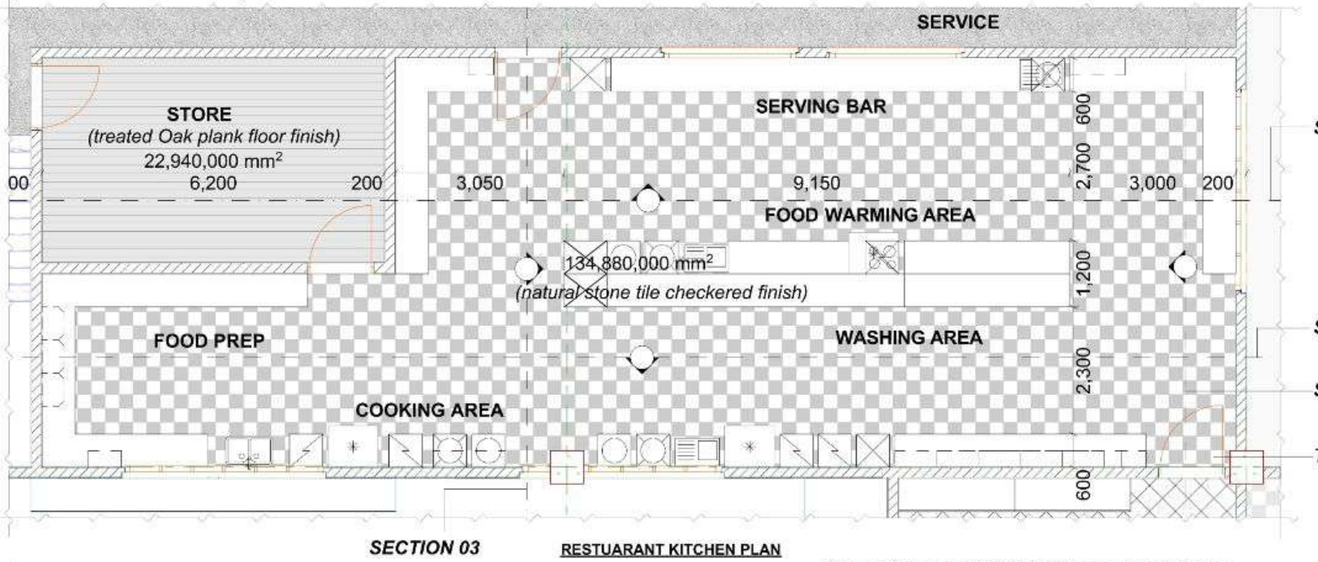
Scale:	Date:	Sheet:	Stamp:
1:50	7th April	W/08	RDNA SHAMSILA

MALL DESIGN: TIGONI

KITCHEN & WCs BLOW UPS

WORKING DRAWINGS

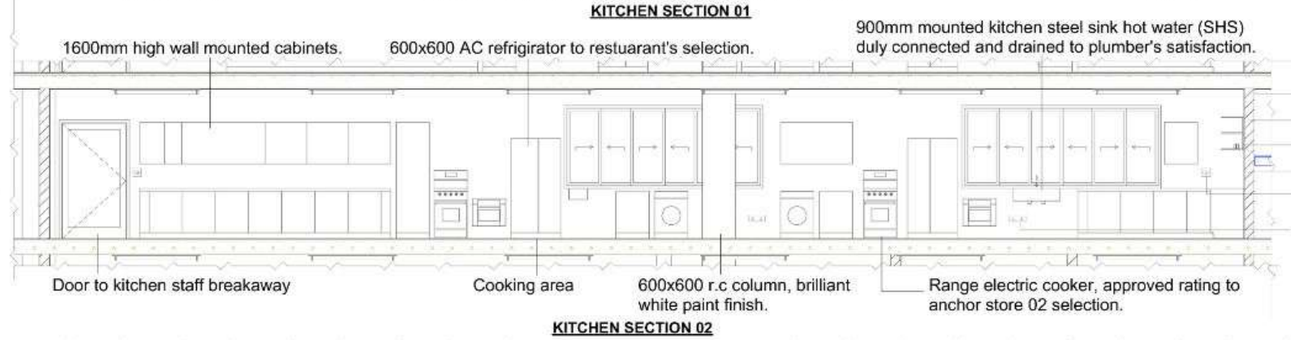
	Drawn by:	Checked by:	Approved by:		
Name:	Collins	RDNA	Tiglath	Client:	Actis Capital.
Sign:				Architect:	TheFiveTime.
				Contractor:	Tiglath Works & Co.



SECTION 03

RESTUARANT KITCHEN PLAN

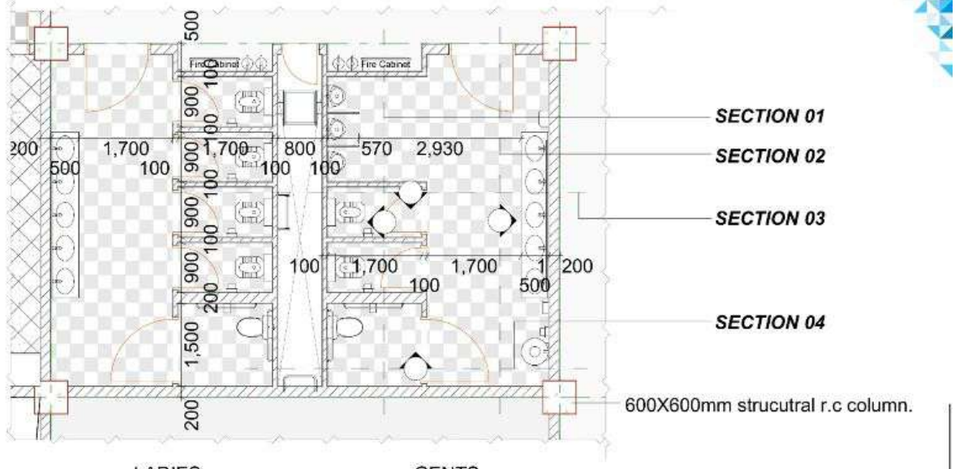
KITCHEN SECTION 01



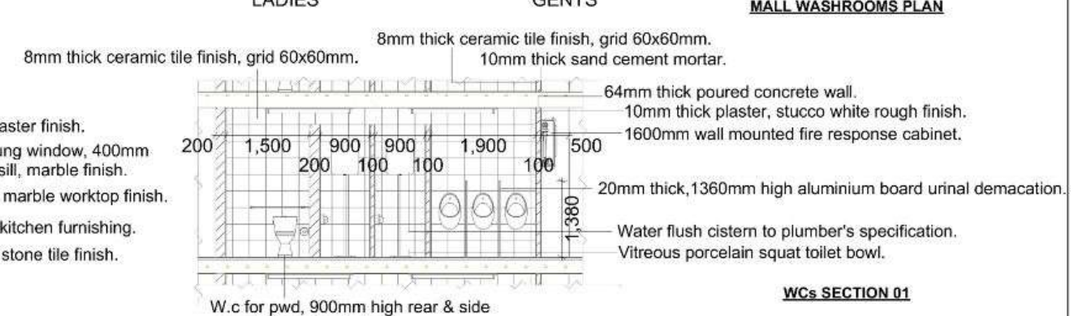
KITCHEN SECTION 02

KITCHEN SECTION 03

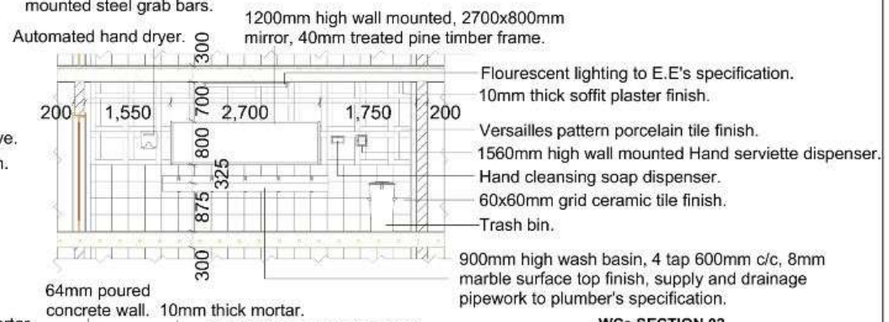
KITCHEN SECTION 04



MALL WASHROOMS PLAN



WCs SECTION 01



WCs SECTION 02

WCs SECTION 03

WCs SECTION 04

REVISIONS

No.	Proffessional	Date	Remarks

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SHEET DATA

Scale:	Date:	Sheet:	Stamp:
1:50	7th April	W/09	RDNA SHAMALA

HIGHRISE OFFICE BUILDING DESIGNS

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2023/24

Benson Kobia
Mshindi Matara
Prudence Neema
Simon Mwendwa

BENSON GITIYE KOBIA

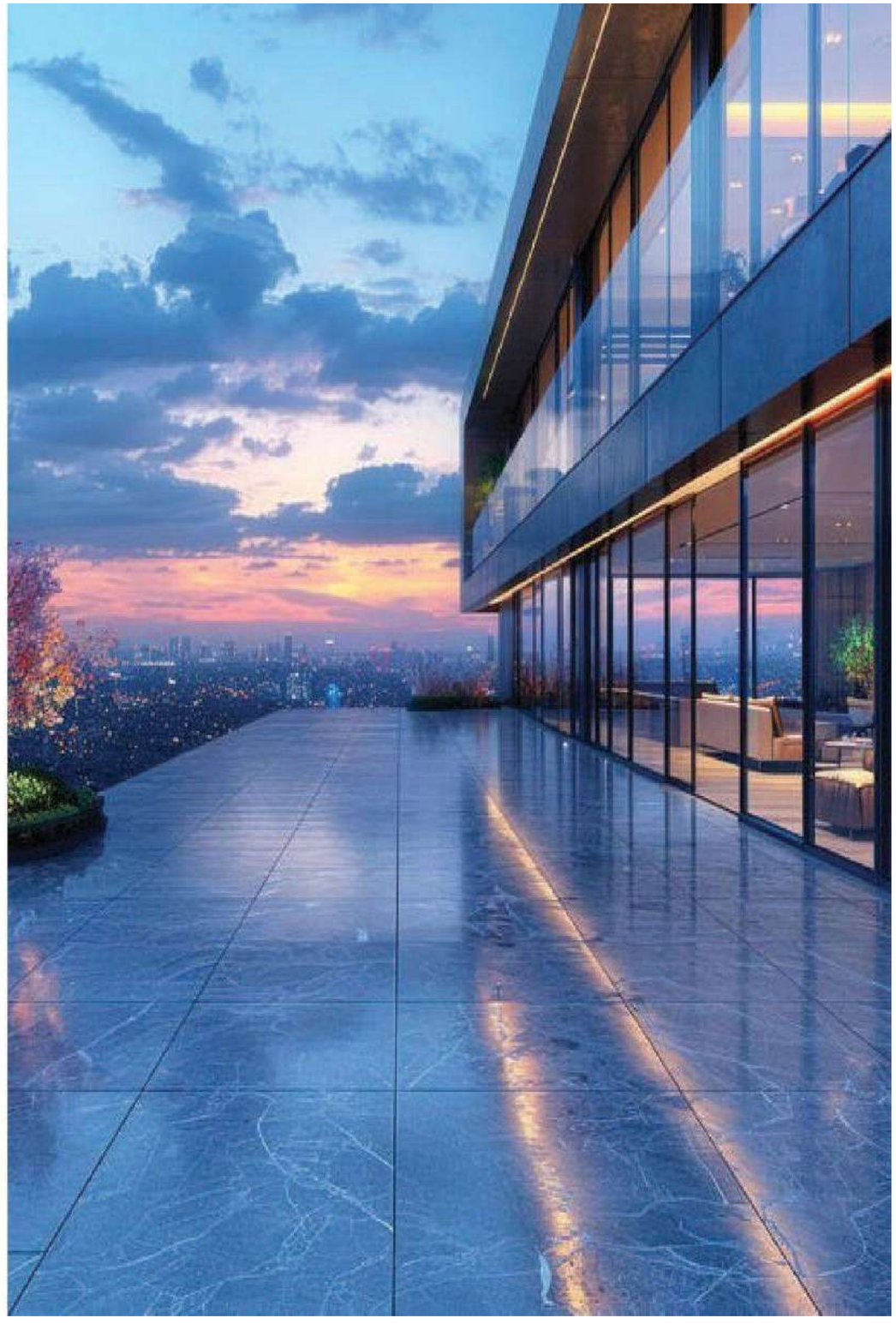
STUDENT AT KENYATTA UNIVERSITY,
SCHOOL OF ARCHITECTURE-BIOGRAPHY

As a dedicated fourth-year architectural student at Kenyatta University, I have cultivated a deep passion for innovative and sustainable design solutions. My academic journey has been marked by a keen interest in creating spaces that are not only functional but also aesthetically pleasing and environmentally conscious. With a strong foundation in architectural principles and a creative mindset, I am poised to contribute meaningful and impactful designs to the built environment.

As I continue my journey in architecture, I am eager to bring fresh ideas and innovative solutions to the field. My aspiration is to become a licensed architect who not only designs beautiful and functional spaces but also contributes to the betterment of the community and the environment. The office complex project is a significant step towards achieving this goal, showcasing my ability to think critically, solve complex problems, and deliver high-quality design solutions.

I am excited to present my vision for the office complex and look forward to the opportunity to bring this concept to life

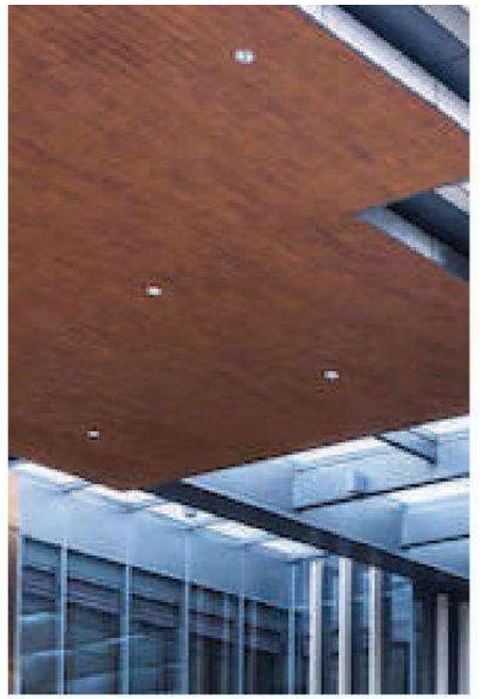
Tel:0742946710
Email:bensongitiye2000@gmail.com
REG NO. B11S/13703/2019
B. ARCH(2019-2024)
KENYATTA UNIVERSITY

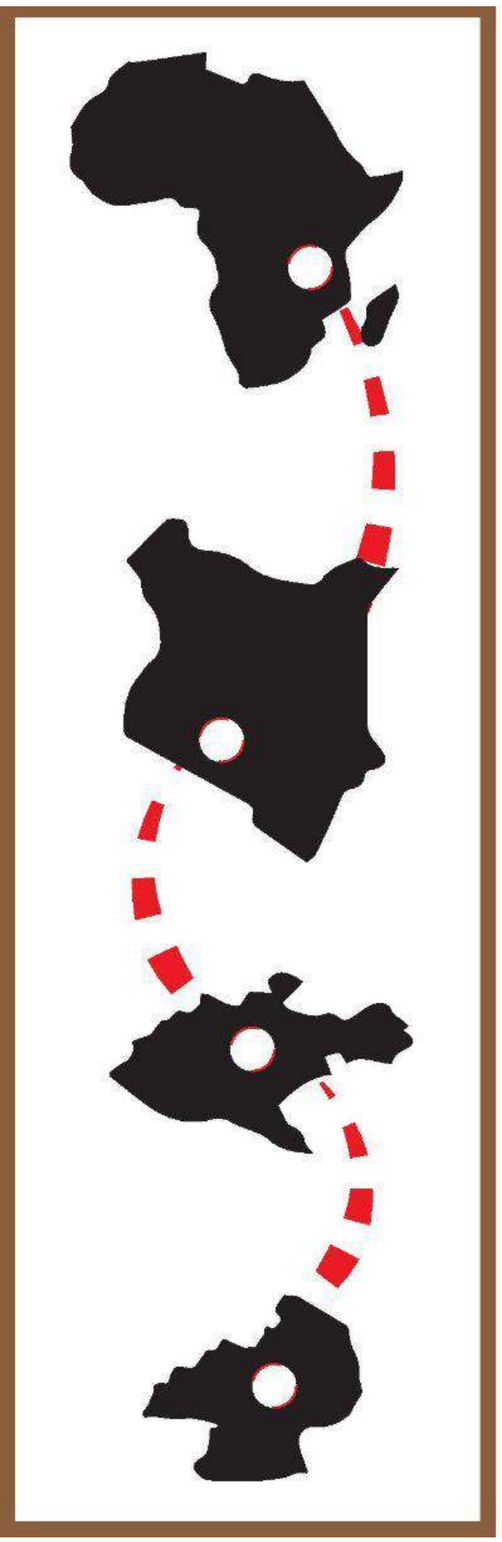


PROPOSED OFFICE COMPLEX DESIGN

NAIROBI,KENYA

This proposal presents a visionary design for an executive office complex, blending modern architecture with functional elegance. The design features a state-of-the-art helipad on the rooftop, ensuring seamless connectivity for high-level executives. The complex offers a luxurious and sophisticated atmosphere, enhanced by thoughtfully curated exterior living spaces that promote relaxation and collaboration. Spanning a plot area of 3,500.50 square meters, this project aims to redefine the working environment by combining cutting-edge amenities with a refined aesthetic, tailored to meet the needs of a dynamic and executive office design firm in Kenya.





LOCATION

Site is located at Westlands Sub County, Nairobi County,Kenya. Westlands is an economic hub that houses a number of office buildings(GTC, OneAfrica, Safaricom etc), two large scale commercial projects(Westgate and Sarit Centre Malls) and one notable sports facility. The site is approx 3km from the CBD and is accessible via the westlands road.

PROJECT OVERVIEW

The main objective of this design is to create a structure that will act as a center for work excellence while at the same time making it enjoyable for the workers. Thus the complex will be a conducive working environment for all its users and encourage cohesion and interaction . This will improve the productivity of the workers.

PROJECT OBJECTIVES

Functional Enhancement: Create a more versatile and adaptable space that can cater to various office needs, from large presentations to intimate workshops.

Sustainability: Incorporate sustainable design principles and energy efficient technologies to minimize the environmental impact of the office complex.

User Experience : Prioritize the comfort and convenience of the office users by optimizing seating arrangements, circulation and amenit

CLIENT DETAILS

Client:Kikwetu Stationery Corporation
Type of Organization:Stationery Supplies Company
Location:Westlands, Nairobi
Category:Corporate Office Design

Client Overview:
Kikwetu Stationery Corporation stands as a prominent and well-established player in the stationery supplies industry within Kenya. The company has carved out a niche for itself as a reliable provider of high-quality stationery products and office supplies, catering to a diverse range of clients that include educational institutions, corporate offices, and individual consumers. The company prides itself on its commitment to excellence, offering a comprehensive range of products that meet the varied needs of its customers.

JUSTIFICATIONS

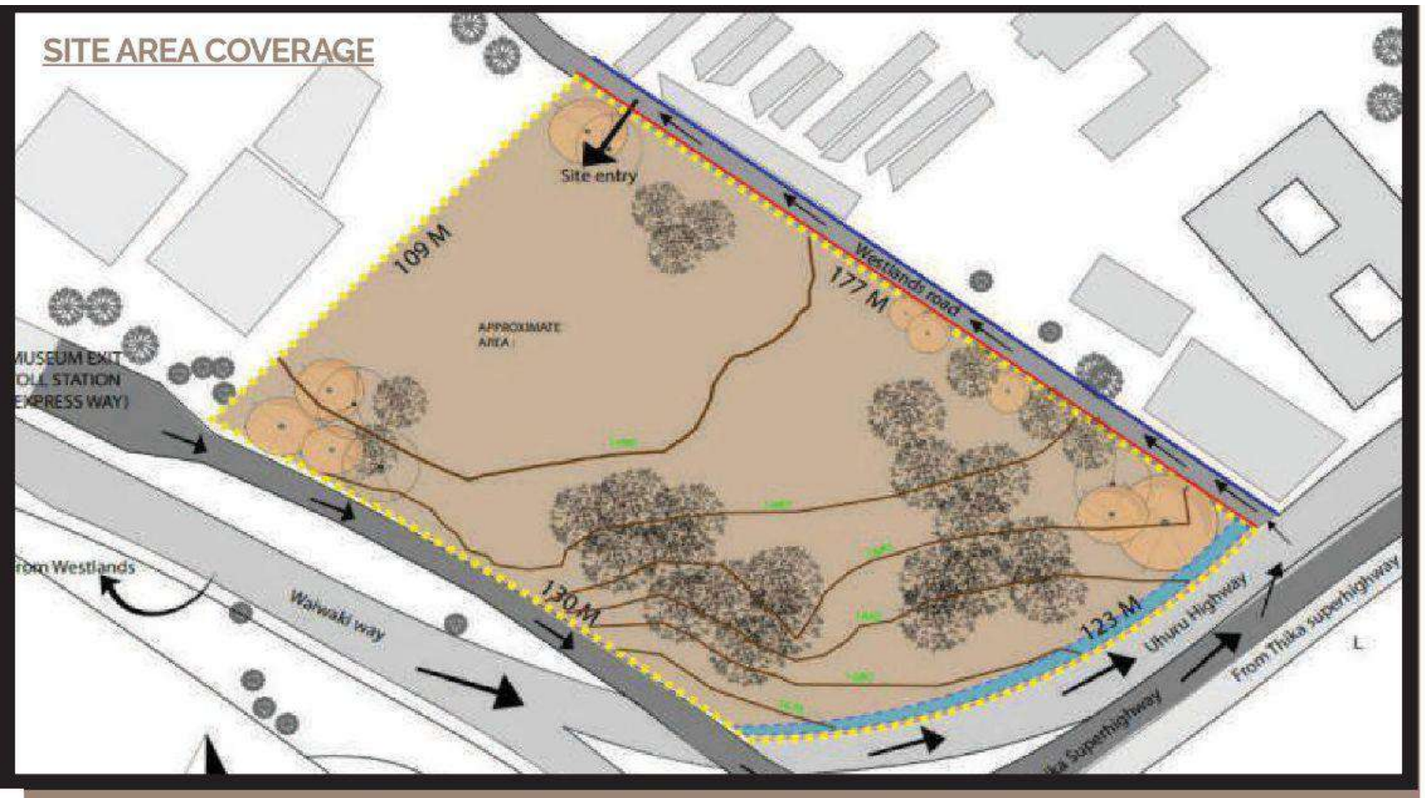
Thriving business locality : Westlands is a home to numerous established companies that foster potential partnerships and networking opportunities for the office complex

Developed infrastructure : Westlands is well equipped with the necessary utilities such as fiber optic internet , electricity and sewer lines plus a rich neighborhood with modern designed commercial build

Prime Location :The site location offers an easy access to major business districts thus is a prime place for thriving business ventures with the easy accessibility.

Upscale residential areas : This attracts a skilled and educated workface that resides in close proximity.

SITE AREA COVERAGE



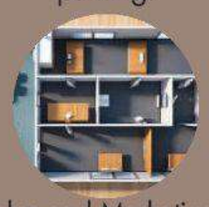
PROPOSED FACILITIES -AREA : 19.293m2 (4.76 acres)

Basement– Provide additional parking spaces supplementing the surface parking.

Security department ,Procurement department and recreational spaces

ICT department and staff work offices (open and closed office layouts)

Human resource department , Project Unit department and planning department

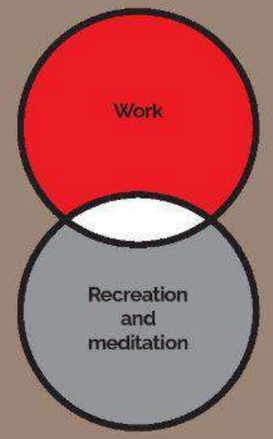


Sales and Marketing and Finance department

Internal Audit department and Meeting & conference room

Executive offices

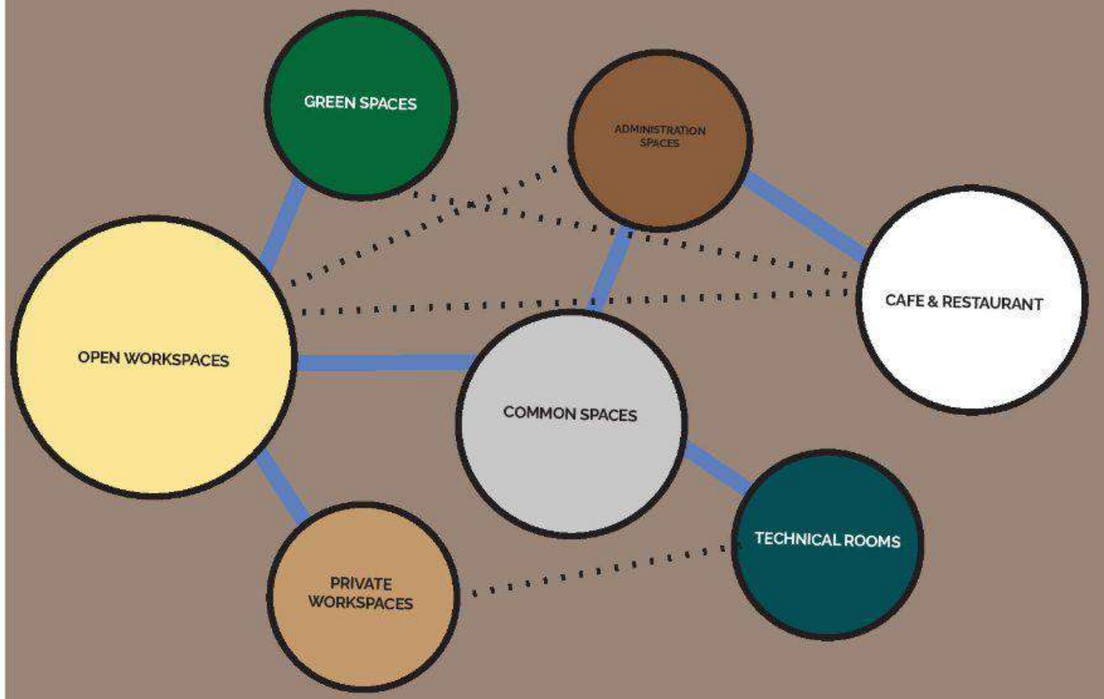
Helipad and water tank spaces



PHISOLOPHICAL CONCEPT

This is a philosophical Concept of Balance. The meaning is that the universe is governed by sets of two opposing and complementing principles or cosmic energies that can be observed in nature . Being an office complex , a balance between work and nourishment is essential for improved productivity of the workers.

BUBBLE DIAGRAM



LEGEND

DIRECT CONNECTION

INDIRECT CONNECTION

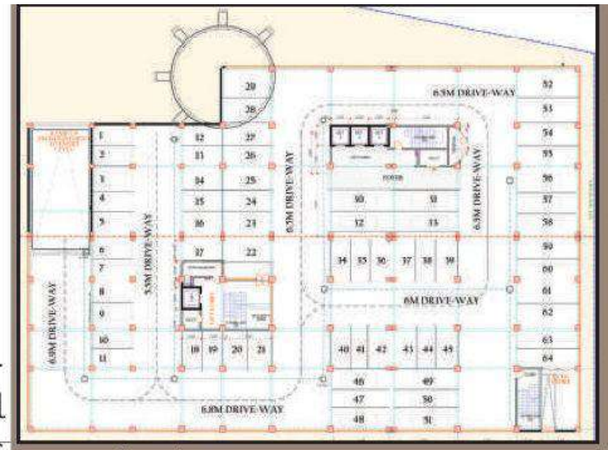
' Architecture should speak of its time and place ,while yearning for timelessness '
by Frank Gehry

Floor plans (Basement - Heli-pad roof plan.

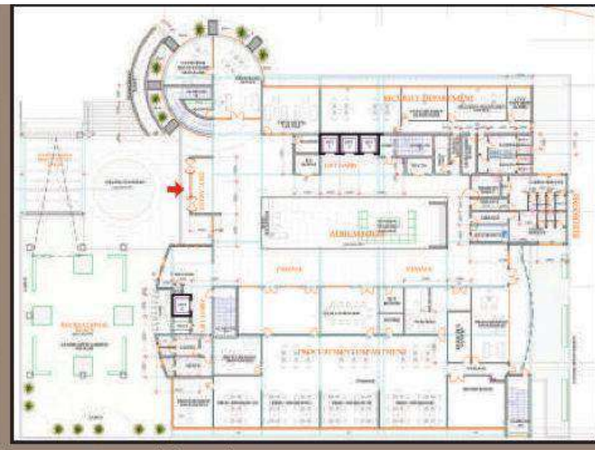
Design Floor Plans

The architectural office complex is thoughtfully designed to optimize functionality and provide a comfortable working environment. The basement level offers additional parking spaces, including electric vehicle charging stations and bicycle storage, enhancing convenience for staff and visitors. The ground floor houses key operational areas such as the Security Department, which ensures comprehensive surveillance and safety, and the Procurement Department, which features open workstations and a conference room to facilitate efficient resource management. This floor also includes recreational spaces, with a lounge, cafeteria, and outdoor terrace to promote relaxation and social interaction.

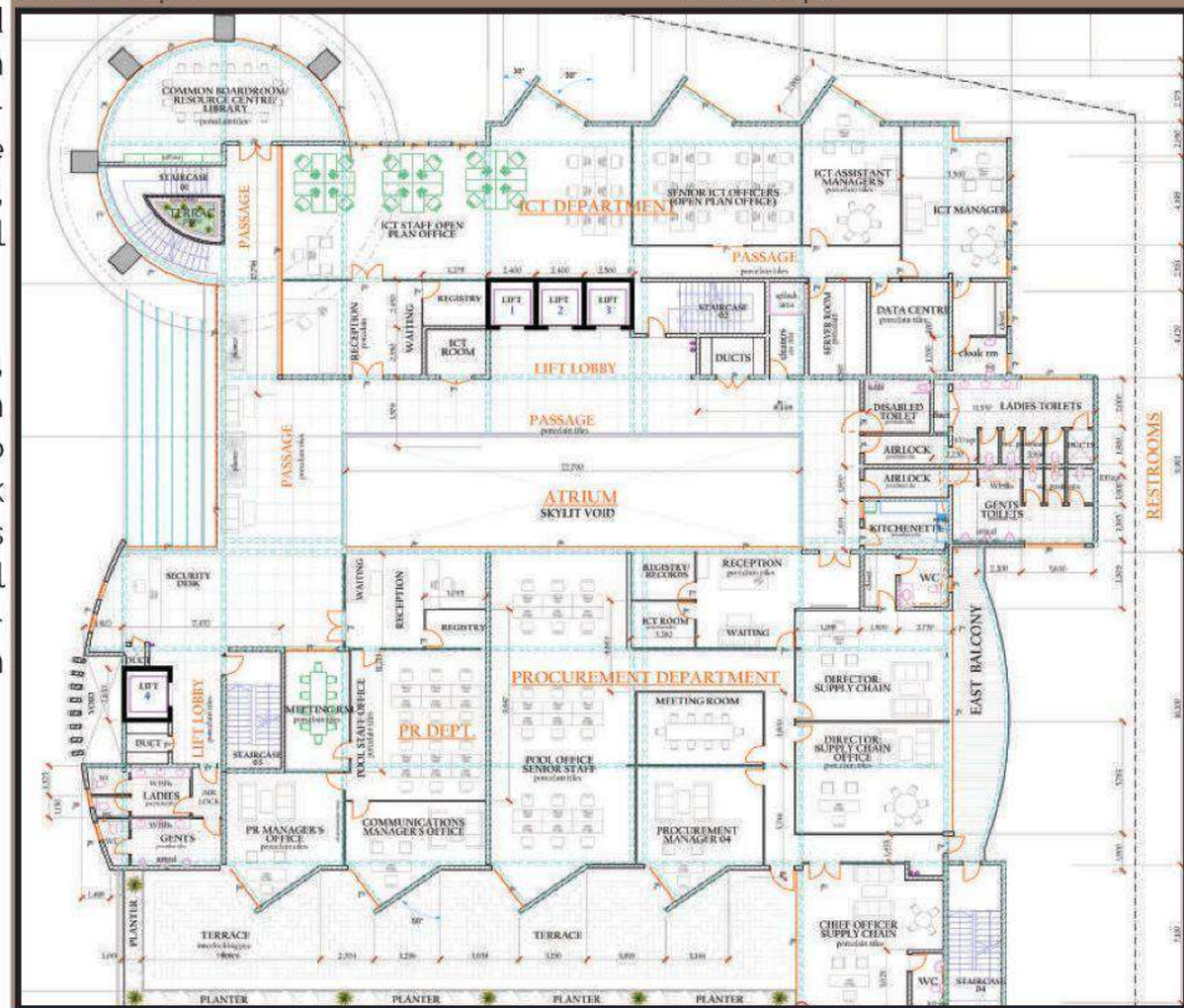
On the first floor, the ICT Department is strategically located for easy access, supporting the complex's technological infrastructure with a server room, tech support stations, and secure data management systems. The floor also features a mix of open and closed office layouts, catering to different work styles. Open-plan workspaces encourage collaboration, while private offices provide quiet areas for focused tasks and confidential meetings. Additional amenities include meeting rooms equipped with video conferencing capabilities and a break room. The design balances operational efficiency with employee well-being, creating a modern and inviting workspace.



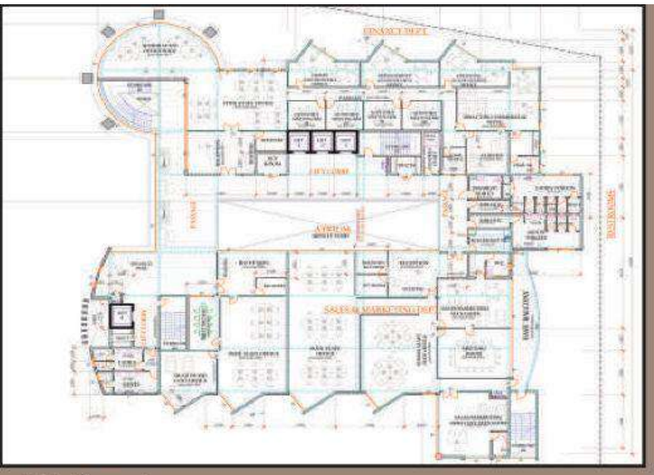
Bazement floor plan



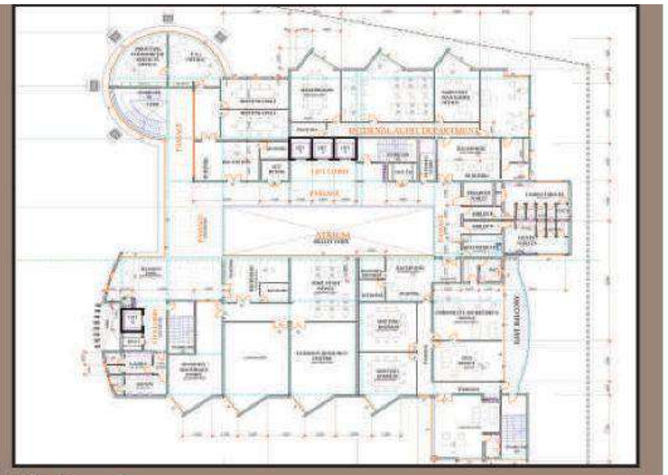
Ground floor plan



First floor plan



Third floor plan



Fifth floor plan

Executive section Floor Plans

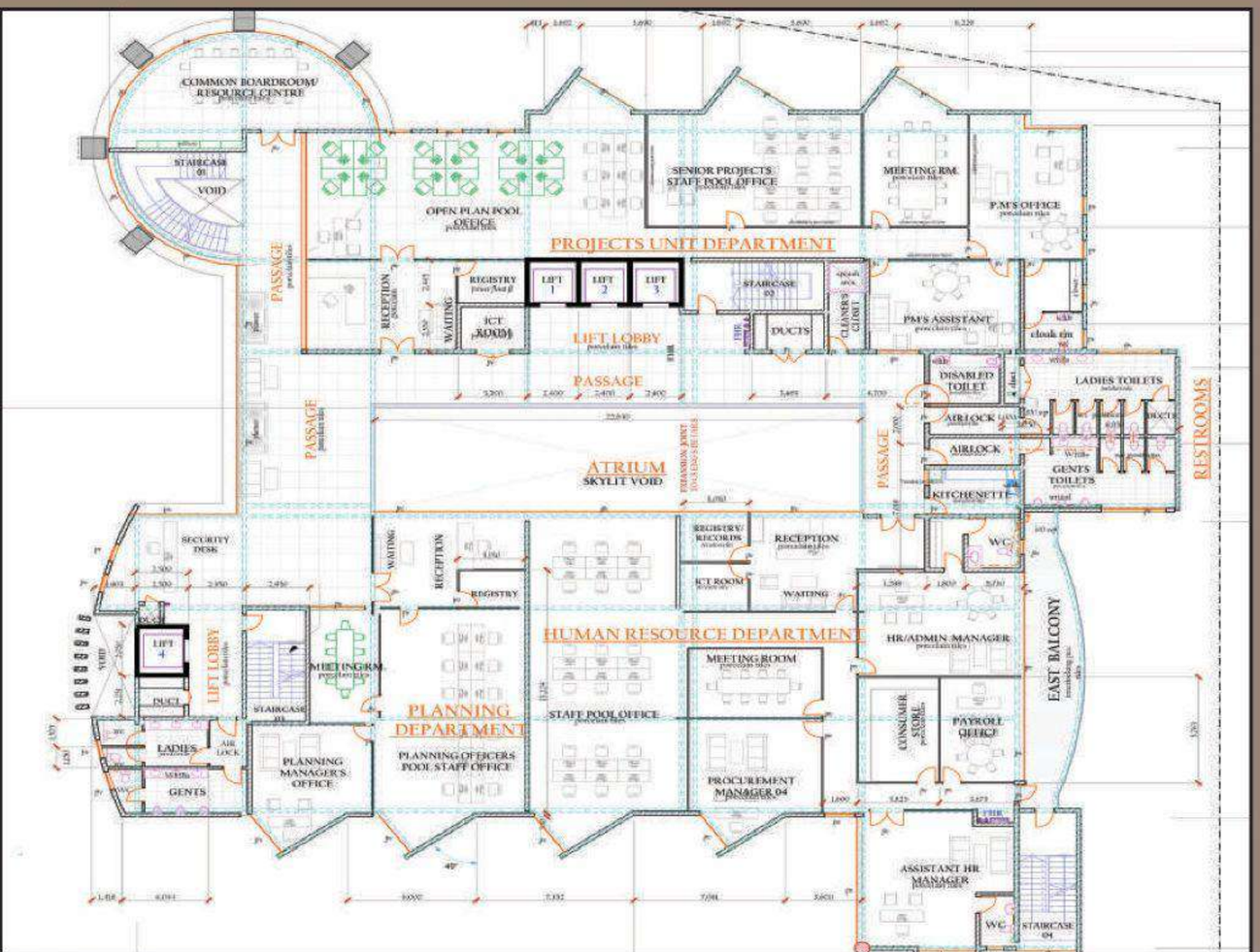
Second Floor: Houses the Human Resource Department, Project Unit, and Planning Department. The HR area features a welcoming reception, interview rooms, and a training center. The Project Unit has open workspaces for collaboration, while the Planning Department offers quiet workstations and meeting rooms.

Third Floor:*Dedicated to Sales and Marketing and Finance Departments. Sales and Marketing have creative workspaces and a presentation area. Finance includes secure offices and conference rooms, with a central lounge for informal interactions.

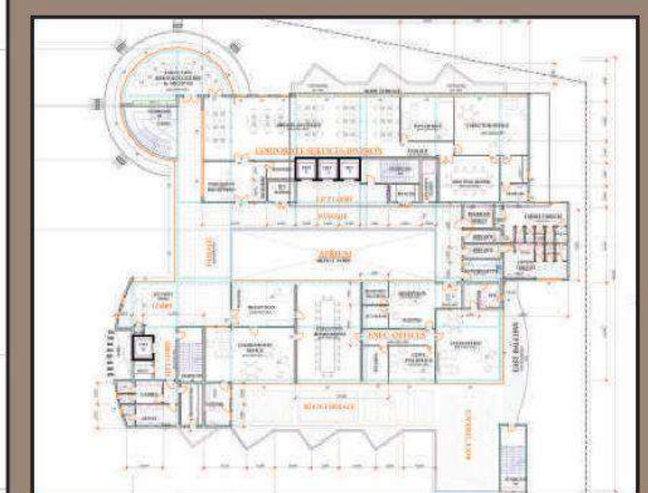
Fourth Floor: Includes the Internal Audit Department, designed for privacy and security, and multiple Meeting & Conference Rooms with advanced audiovisual facilities for various meeting sizes.

Fifth Floor:Reserved for Executive Offices, each with a private lounge, meeting rooms, and scenic views. A shared executive lounge and boardroom are also provided.

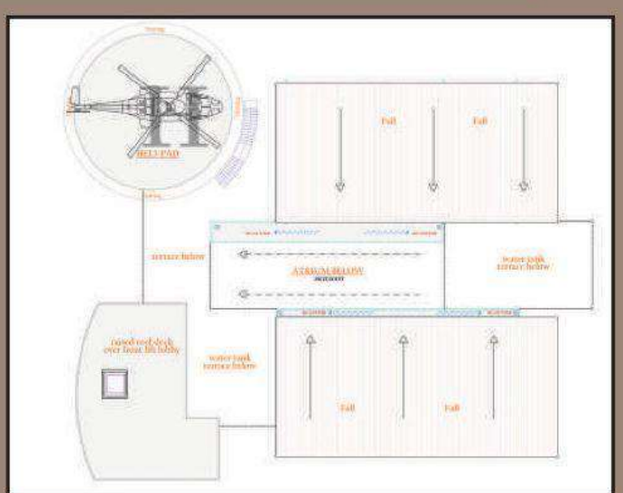
Roof:Features a Helipad for executive travel and water tank spaces for reliable water supply.



Fourth floor plan



Sixth floor plan



Roofing plan

Concept Ideology

The elevations of the proposed office complex exhibits a contemporary and dynamic design, characterized by a combination of glass, steel, and concrete elements. The structure rises gracefully, with a distinct curvature on the left side, enhancing the building's aesthetic appeal and providing a sense of movement and modernity.

Facade Design: The facade prominently features large, floor-to-ceiling glass panels, maximizing natural light penetration into the interior spaces. This extensive use of glass not only offers panoramic views of the surrounding urban landscape but also fosters a visually open and inviting atmosphere.

Curved Elements: The building's left side showcases a bold, curved architectural feature, creating a striking visual contrast with the more linear elements on the right. This design choice adds a unique identity to the structure and contributes to its modern aesthetic.

Helipad and Rooftop: At the top, the elevation includes a clearly visible helipad, signifying the building's functionality for executive travel. The rooftop is also equipped with essential infrastructure, including water tanks, seamlessly integrated into the design to maintain a clean silhouette.

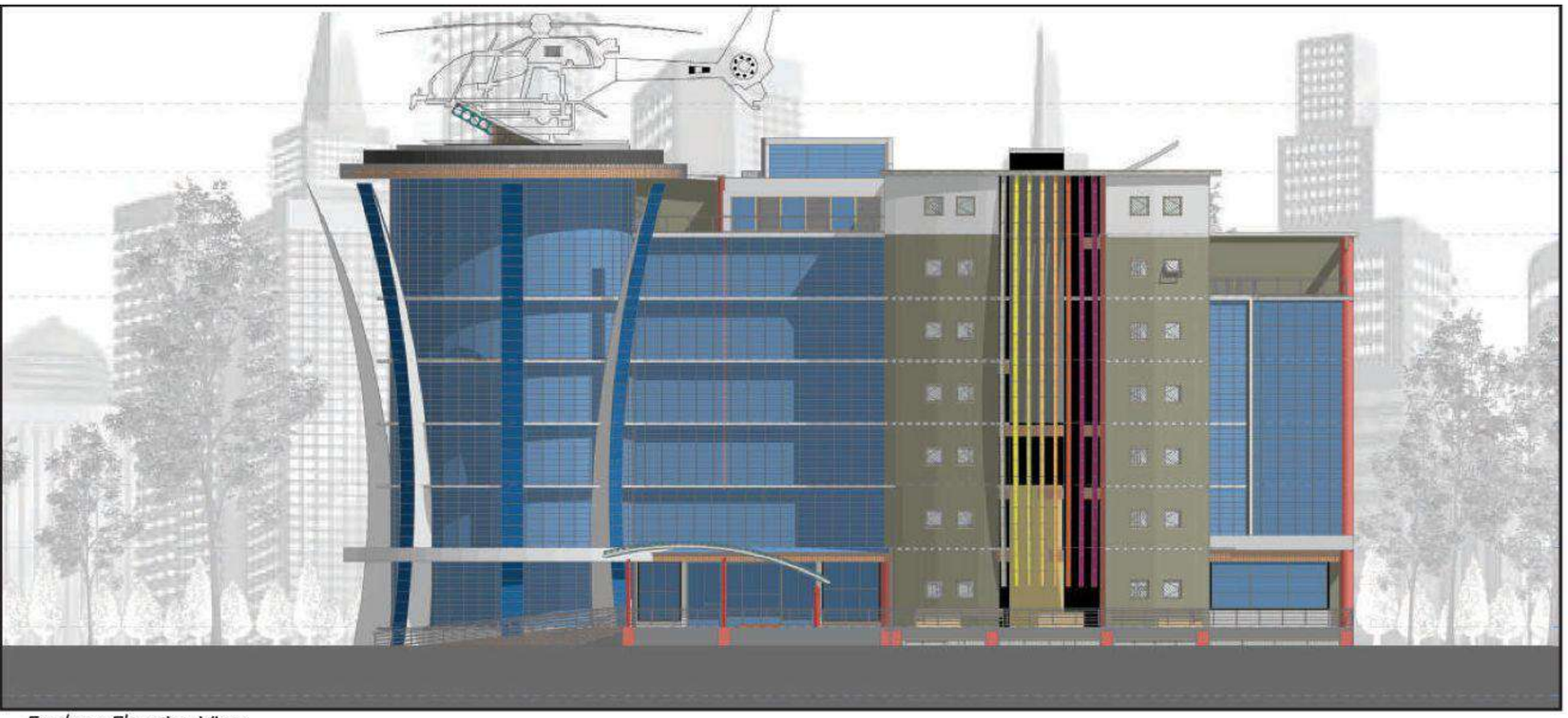
Southern Elevation.

Southern Elevation View

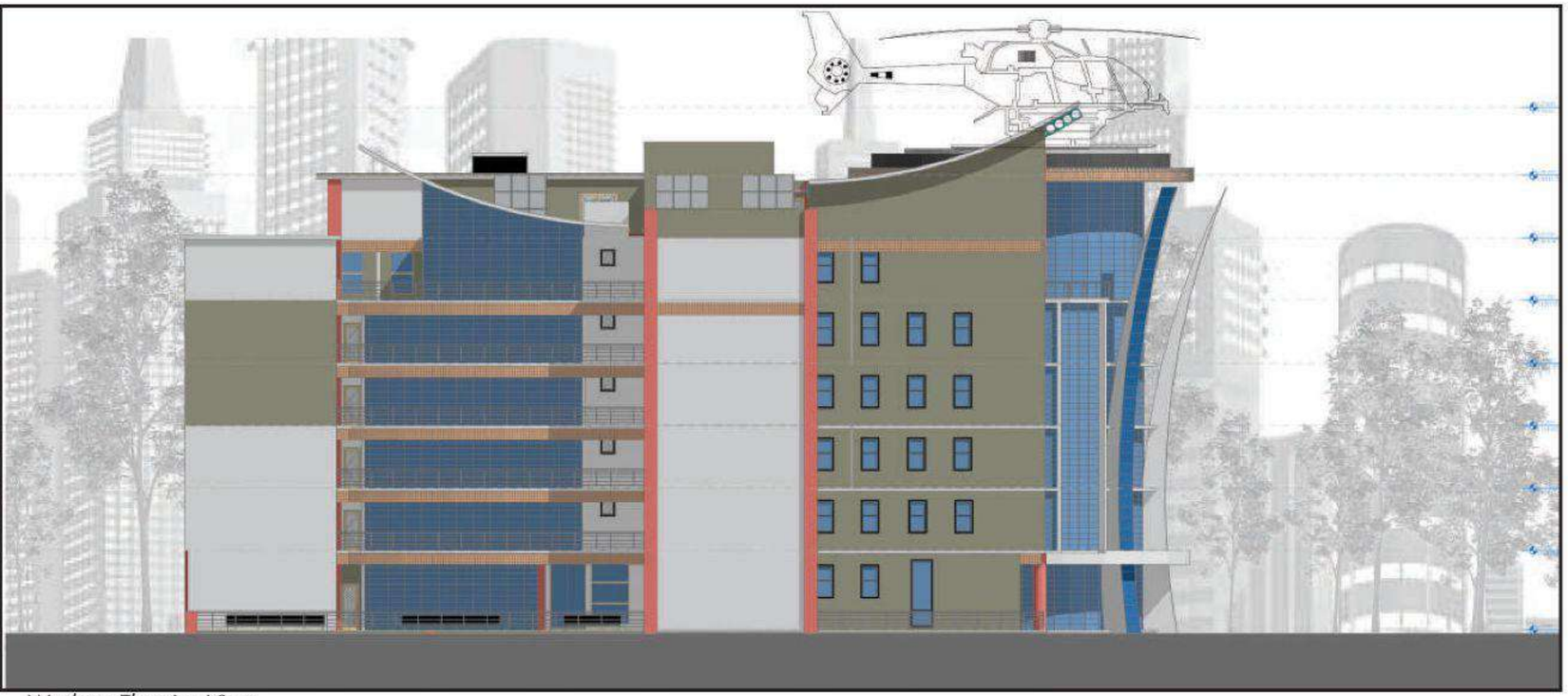
Northern Elevation.

Northern Elevation View

Eastern Elevation.



Easthern Elevation View



Westhern Elevation View

Western Elevation.

Sustainability Considerations: in the elevations

Energy Efficiency: The extensive use of high-performance glazing helps in reducing solar heat gain, thereby minimizing the building's cooling loads. This contributes to energy efficiency, reducing the overall carbon footprint.

Natural Ventilation: The design allows for effective cross-ventilation, particularly in the central core and open spaces, which helps in maintaining indoor air quality and reducing the reliance on mechanical ventilation systems.

Solar Shading: The building's orientation and facade design incorporate passive solar shading elements, such as overhangs and louvers, that help to control glare and reduce heat gain, further enhancing energy efficiency.

Green Integration: The inclusion of rooftop greenery and potential for vertical gardens within the curved architectural elements promotes biodiversity, improves air quality, and contributes to the overall ecological footprint of the building.

Site planning $ Zoning

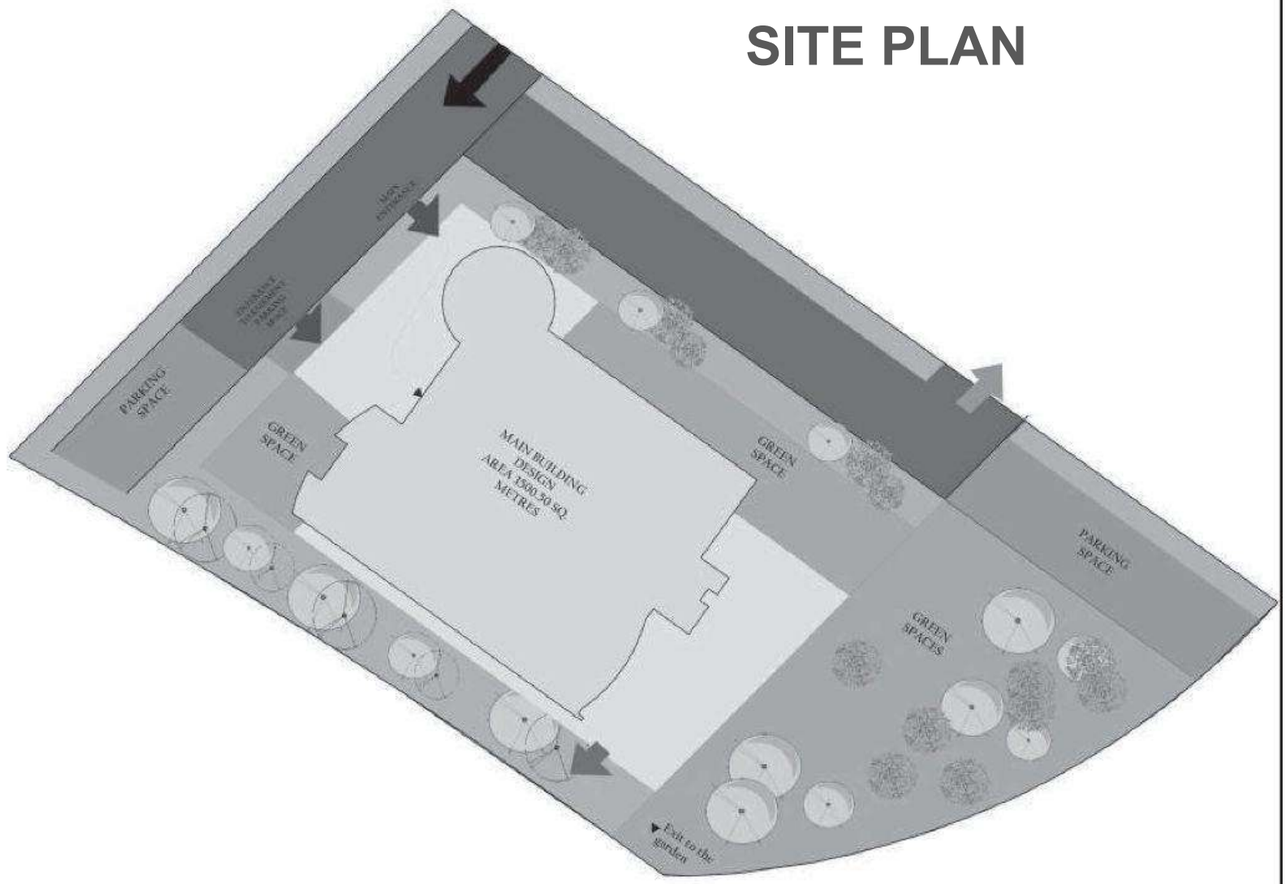
Exterior Elements:
The Main Building, covering 3,585 square meters, is the centerpiece of the site. The building is flanked by Parking Spaces on the left and top-right sides, ensuring convenient access for staff and visitors. These spaces are strategically positioned to minimize congestion and allow for easy entry and exit.

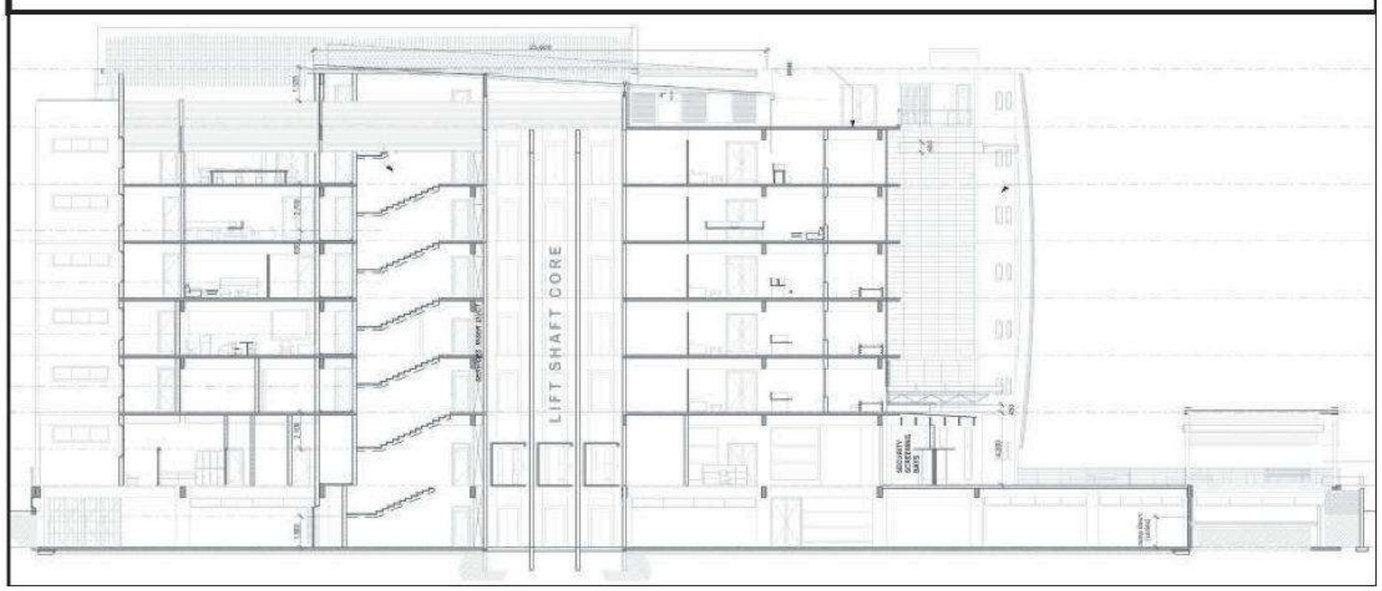
Green Spaces surround the building, enhancing the site's visual appeal and providing outdoor areas for relaxation and informal gatherings. The landscaped zones are carefully placed to create natural buffers between the parking areas and the main building, fostering a serene atmosphere. The Exit to the Garden on the lower side offers a tranquil escape, connecting the interior spaces to the outdoor environment.

The Main Entrance is prominently located at the top, providing a welcoming approach from the adjacent road. This entrance leads directly into the building's reception area, ensuring smooth flow and easy access.

This section view illustrates the functional zoning and vertical organization, ensuring efficient movement, privacy, and accessibility throughout the complex.

SITE PLAN





SECTION

3D VIEWS

Render/visuals 01

3D VIEWS

Render/visuals 02

MSHINDI MATARA

NAME: Isaac Mshindi Matara, BAS IV.

INSTITUTION: Department of Architecture & Interior Design (DAID), Faculty of Engineering and Architecture (SEA), Kenyatta University (KU).

EMAIL ADDRESS: mshindisaac@gmail.com

BIOGRAPHY:

Mshindi Matara has completed his fourth-year of Architecture at the Kenyatta University, where he is pursuing a Bachelor's degree in Architecture. The guiding principle, 'From Simple to Complex,' is exemplified in his recent project, 'The Interchange Haven: Mixed Urban-Use Development,' which utilizes streamlined forms and lines to achieve a sophisticated, sustainable architectural design. Alongside his academic endeavors, Mshindi has worked with various architectural and construction firms, contributing to the design of numerous primary and secondary schools under the MPesa Foundation programme. He has gained valuable industry insights during his internship under the mentorship of seasoned professionals. Mshindi is also actively engaged in voluntary STEM mentorship programmes, guiding aspiring students in Kenyan schools.

SITE AND PROJECT SELECTION

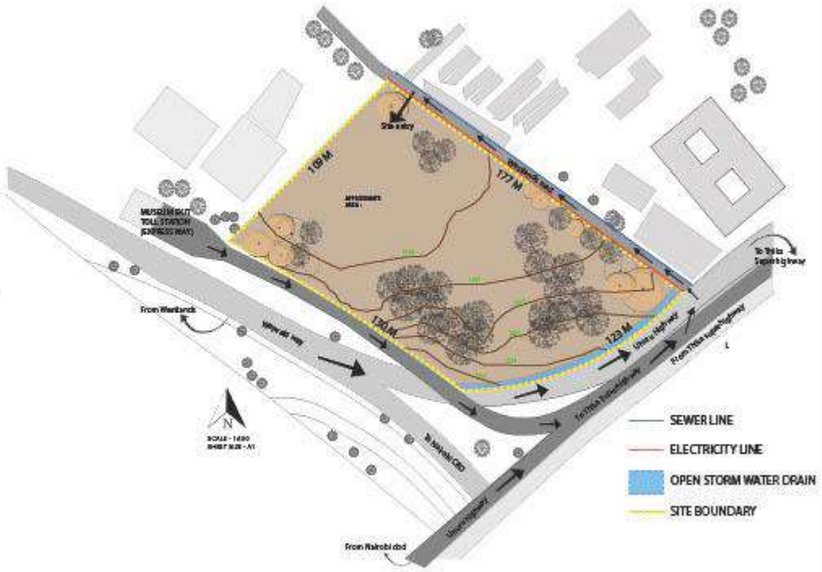
THE SITE

Introduction to site

Location: Westlands area in Nairobi
Size:
Context: Urban
Project name: Mixed Urban Development

Site justification

Dense population: The availability of a huge population of people within the dense urban fabric of the area ensures a ready market for the proposed project.
Well to do Inhabitants: Westlands area is one of the major places in Nairobi inhabited by rich people. This factor makes the site more viable for a high-end project of this magnitude.
Convenience: The site is more convenient to the office users all around the larger neighborhood as other malls are a bit distant from the site.



BRIEF ANALYSIS

PROJECT OVERVIEW

TITLE: A PROPOSED COMMERCIAL CENTER
CLIENT: KENYATTA UNIVERSITY
LOCATION: WESTLANDS IN NAIROBI
CONTEXT: URBAN
PLOT SIZE: 4.
PROJECT TYPE: A MIXED-URBAN DEVELOPMENT
USERS: DIVERSE SET OF USERS

PROJECT BRIEF

OBJECTIJES:

1. SUSTAINABILITY
2. TECHNOLOGY AND CULTURE
3. ENVIRONMENTAL (DAYLIGHTING, VENTILATION AND ORIENTATION)
4. FUNCTIONALITY AND DESIGN EFFICIENCY.

PROJECT JUSTIFICATION:

Viability: The site is in a prime location that costs a lot. A mixed Urban Development project just proves to be the most viable option to justify the development of the site.
Ready Market: Provision of Office spaces and Residential units provides an internal market to ensure the project is functional throughout its lifetime.

SPATIAL REQUIREMENTS

RETAIL

KIOSKS
ANCHOR STORE
SPECIALTY STORES:
ELECTRONIC STORE
BOOKSTORES
DEPARTMENTAL STORES
ART GALLERY
PET STORE
BOUTIQUE
SPA
BANKS

FOOD

FOOD COURTS
RESTAURANTS
FOOD OUTLETS

BEVERAGE

CAFES
COFFEE SHOPS
PUBS
ICE CREAM

RECREATION SPACES

GAME ZONES
KIDS ZONE
GYM
CINEMA HALLS
PLAY GROUND

ADMINISTRATION SPACES

OFFICES:
a. MANAGERS OFFICE
b. ASSISTANT MANAGERS OFFICE
c. SECRETARY
d. SHARED OFFICE SPACES
e. BREAK ROOMS
f. CONFERENCE ROOM
RECEPTION AREA
LOCKER ROOMS

SUPPORT

WASHROOMS
LOUNGES
HEALTH UNIT
BAGGAGE COUNTER
ATMS
SMOKING AREA
SECURITY

OFFICES

SHARED OFFICE SPACES
BREAK AWAY ROOMS
CONFERENCE ROOMS
PRIVATE OFFICE SPACES
OPEN LAYOUTS

RESIDENTIAL AREA

STUDIOS
1 BEDROOM APARTMENTS
2 BEDROOM APARTMENTS
3 BEDROOM APARTMENTS
LOUNGES
LIBRARY
PLAY AREA
GYM

PARKING AREA

BUSES
4 WHEELERS
2 WHEELERS
DISABILITY
SERVICE PARKING

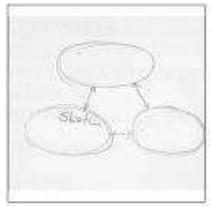
CONCEPT DEVELOPMENT

DESIGN CONCEPTS

Being a mixed urban development project looking forward to serving the diverse communities of people and within an urban setting that is rich in diversity, the sources of design concepts should come from a diverse source.

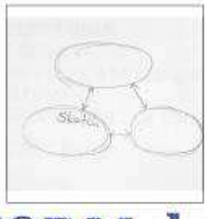
PLANNING CONCEPT: ZONING OF FUNCTIONS

ANALOGY: THE INTERCHANGE
The interchange connects three different directions from a point, South of the site.
It creates a flawless connection, allowing for allowing for cars to move from one direction to the other, with clearly defined lanes for fast track transportation.
Conclusion: Separate the functions of the building into three distinct functions, and arrange them to have an intricate and clear connection from one to the other.

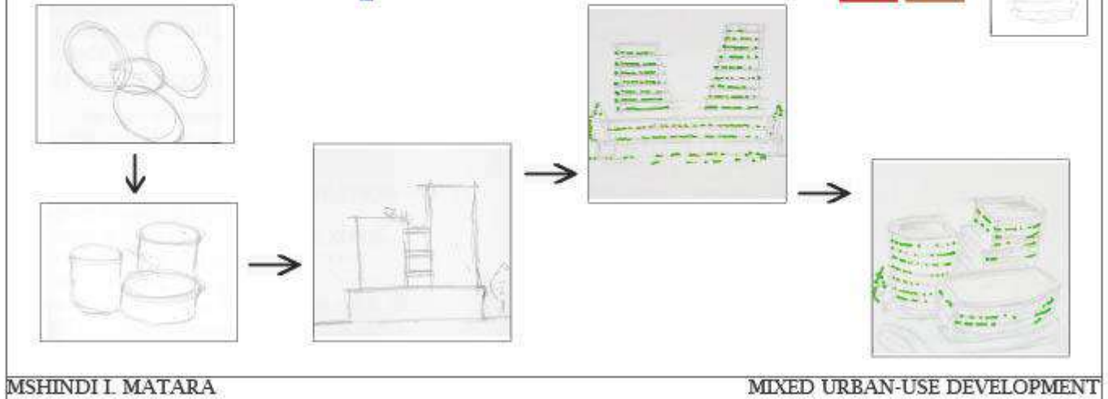


HIERARCHICAL ARRANGEMENT OF THE FUNCTIONS

ANALOGY: THE INTERCHANGE
The Intercgange exhibits a hierarchical arrangement whwereby, from the outermost lanes, there is a service lane for exit and entrance into and out of the main carrier lanes.
From the sevice lanes we have the main carriers and finally, elevated higher up is the express way serving the elite in the town with ease to avoid the traffic jams on the main carriers.
Conclusion: Arrange the three functions of the project from public to semi private to private spaces in relation to the main entrance.

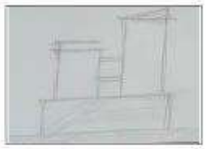


FORM development



TECHNOLOGICAL CONCEPT: FOSTER INTERCONNECTEDNESS

ANALOGY: SKYBRIDGE
Incorporate the use of bridges to connect the three masses to foster the idea of interconnectedness.

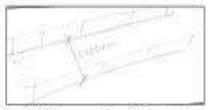


ANALOGY: INTERCHANGE
Use of Cantilevers: Incorporate the use of long spans of slabs and beams as seen on the express way. Make the skybridge long to make use of the technology.

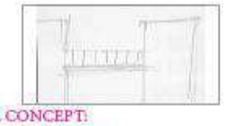
Prestressed Concrete: Employ the use of prestressed concrete especially in the parking area to achieve longer spans.

ANALOGY: INTERCHANGE
Interconnectedness: Crisscross the skybridges to mimic the interchange and how the lanes intertwine over different levels.

Traffic Flow: Provide wide bridges and walkways to allow for easy flow of traffic within the building.



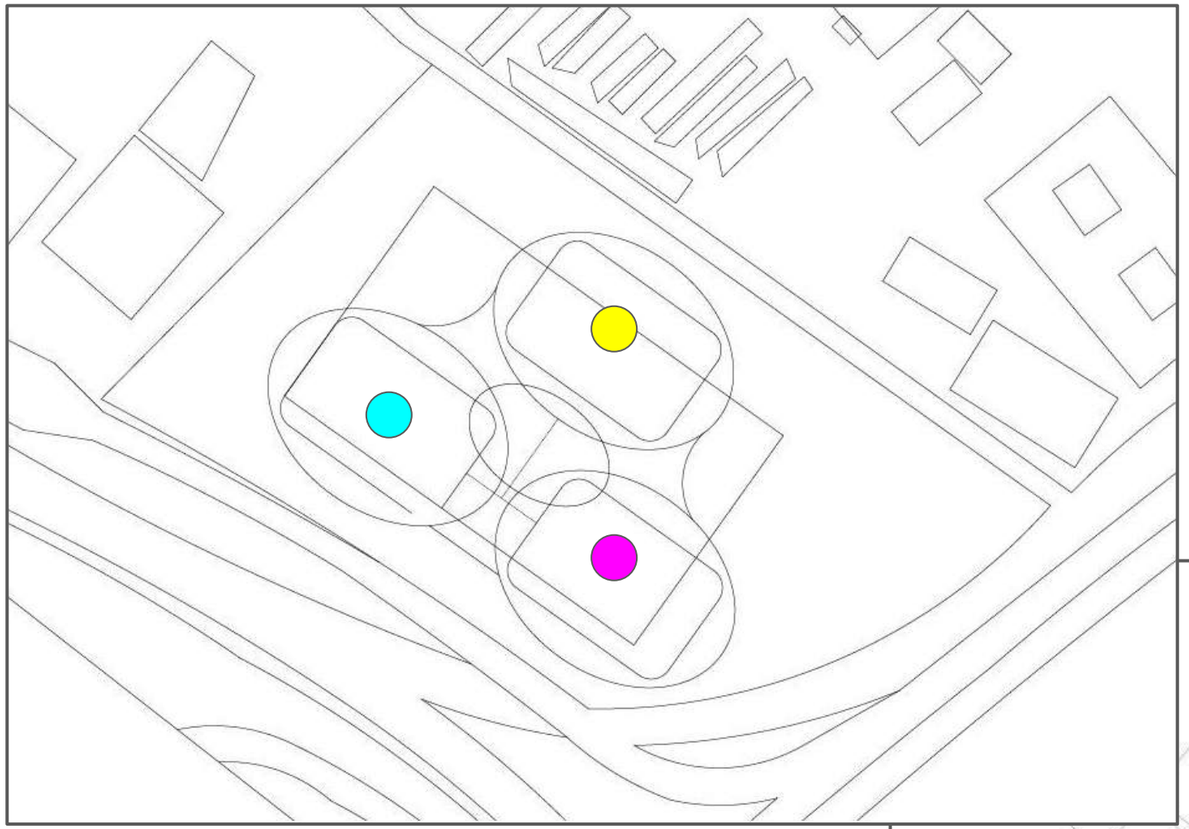
Guard Rails: Use guard rails along cantilevers, bridges and walkways to protect the users



SOCIO-CULTURAL CONCEPT:

ANALOGY: KENYAN BRACELET
The Kenyan flag bracelet is one of the current generation's most accepted artefact. It is used by most youths and even people of older generation, and is currently used as on of the identities of Kenya internationally.

Colour and The Layering



CONCEPTUAL SITE PLAN

LEGEND

- Commercial use
- Residential tower
- Office tower
- Proposed building coverage

In this phase the conceptual proposed building footprint is been fit to site.
The rectangular bottom represents the preferred building coverage leaving the rest of the site for:
1)Landscaping
2)Circulation pathways.This is inclusive for both vehicular access and pedestal access.
3) Kids play area.
4)Outdoor parking areas
All with the allowance for set setbacks as per the building regulations.
As of the spatial planning for the three main building functions commercial.residential and office they are to be arranged around a central courtyard which serves as a connecting point for all.This is as dictated by the selected planning concept,The Interchange which helps fulfill the overall design goal to efficient interrelationship of the diverse spatial uses of the design.

CONCEPTUAL GROUND FLOOR

The main spatial privisions that were to be provided for are:

- Retail stores.
- Restaurants and food outlets
- Centralized courtyard with planters and seating spots.This was to serve as the main connecting point between the three main volumes of the building.
- An ample service access and loading bay.The key point in designing this was to ensure that a freight elevator was to be provided for and ample storage for bulk items.It was also to be located close to the anchor tenant as they would be main users of the space and also was to be hidden from the main entrances of the premises.
- An outdoor restaurant space

At the main entrance,the design approach was such that it would allow for easy drop off and pick up of the users that enough clearance was to be provided for.In accessing the basement floors various ramps were to be provided.The ramps will be user specific where one is for the residential basement,the other for office user basements and the last for the commercial zone.
Dividing the basements in this main would be crucial in matters of security and also in aiding with the way finding as much vehicular traffic is expected in the premises.

AN INTERIOR RENDER OF THE CINEMA HALL ON THE 1ST FLOOR

CONCEPTUAL 1ST FLOOR PLAN

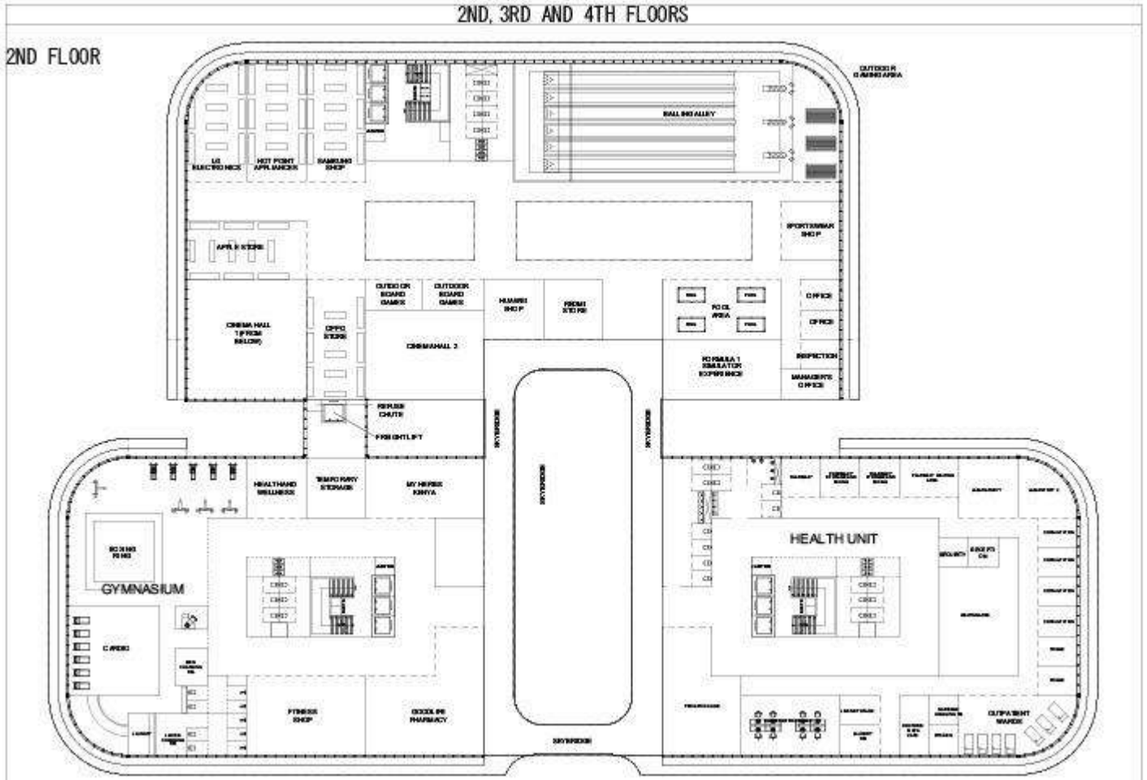
Main spatial provisions:

- Retail stores
- Fashion and beauty stores
- Restaurant and food outlets
- Anchor tenants: Supermarket and banks
- Cinema hall(2)
- Sanitation spaces.

As for the cinema hall,inclusivity is key whilst ensuring that the layout adopted ensures accommodation of the maximum number of users with much comfort to ensure that there is increased dwell time of the users.

To achieve this main access to the facility is to be placed on the ground floor and some rows left out for wheelchair users.This helps ensure that even the differently abled would easily access and use the space comfortably as the other individuals.

The retail stores are also to be arranged such that those selling same products are placed close together which will aid with ensuring competition thus enhancing provison of high quality services and also ensure that they are easily located by the new users of the space.



CONCEPTUAL 2ND FLOOR

Spatial provisions:

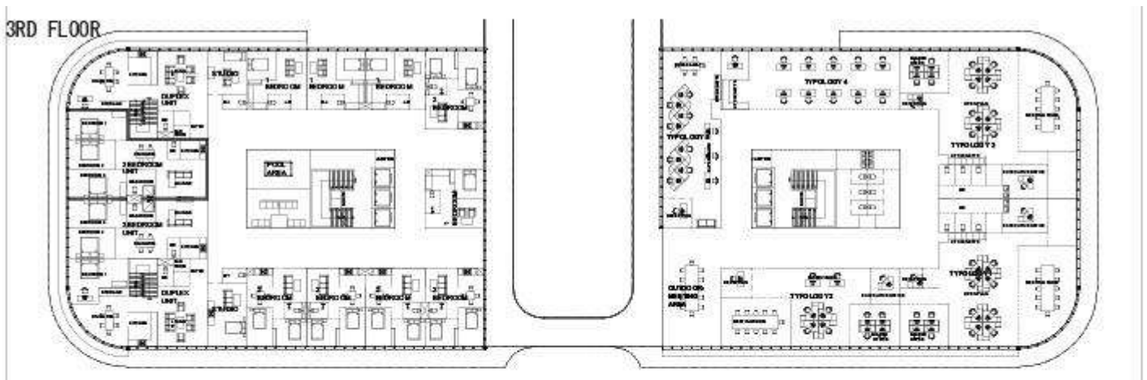
- Gaming and fitness zones
- Anchor tenant:Health unit
- Retail stores
- Restaurant/dining spots.

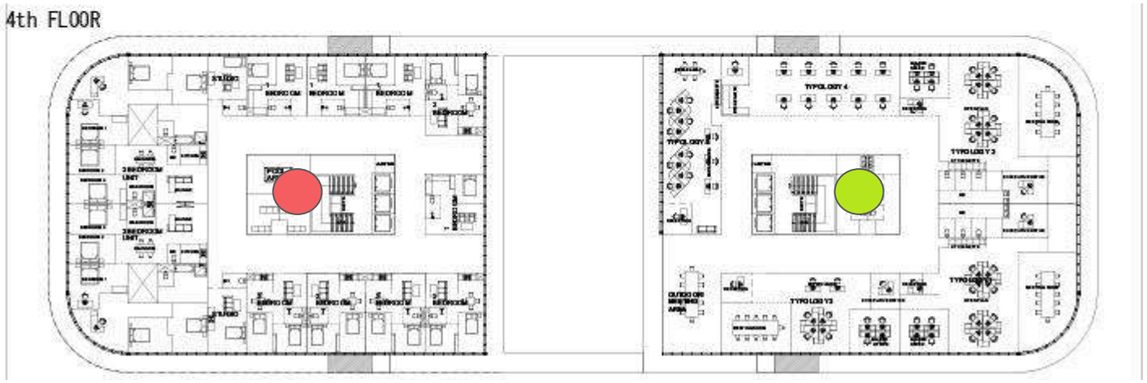
The gaming zone is to serve both kids and adults.Some of the games to be included:
-Bowling alley
-Pool tables
-VR gaming
-Gym area
With all the inddor games included its guaranteed that the building has a good inflow of customers daily as most f the games are those played by the elite who are the main population in the area.
Locating the health unit on the top most commercial floor aids in ensuring maximum exposure of the users to the various services provided.The unit however is to be designed to deal with minor illnesses lab testing and maternal care whilst the major health complications will be referred to major hospitals in the main country.

CONCEPTUAL 3RD FLOOR

This floor serves as the transitional floor from the commercial zone to the more private zones the office and residential areas.
A void is to be left in between to avoid covering up the courtyard on the bottom floors and the roof slab built with a 2500mm high paraquet wall that helps

- Cover the plainness on the roof slab.
- Create a decent finishing on the last floor of the commercial zone.
- The decent finishing also helps in minimizing exposure of the curved glass atrium that may not be too pleasing to the eye.





CONCEPTUAL 4TH AND 5TH TYPICAL FLOOR PLANS

RESIDENTIAL TOWER

Provisions:

- Studios

Two per floor.

- 1 Bedrooms

Four per floor.

- 2 Bedrooms

Five per floor

- 3 Bedrooms

Two per floor.

- Duplex units

Two per floor.

OFFICE TOWER

Provisions:
For the office tower 5 different office layouts were adopted in every floor creating variety aiding in faster renting of the spaces .
The tower has a total of 8 floors running from 3rd floor to 10th floor.

PRESENTATION PLANS

SITE PLAN
SCALE 1:500

KEY:
1. OUTSIDE PARKING AREA - FOR FAST USE
2. KIDS PLAY GROUND(INCLUDING A PARENTS' WATCH
3. OUTSIDE SITTING AREA
4. OUTSIDE EATING AREA
5. GREEN SPACE
6. RAMP TO 1ST BASEMENT
7. RAMP TO 2ND AND 3RD BASEMENTS
8. SERVICE YARD
9. SERVICE PARK
10. SERVICE CHUTE(WITH FREIGHT LIFT)
11. ATRIUM GLASS COVER
12. WATER FEATURE(S)
13. COMMERCIAL SPACE PODIUM
14. RESIDENTIAL TOWER
15. OFFICE TOWER
16. MAIN ENTRANCE(GATE)
17. SECONDARY ENTRANCE(FOR SERVICE, RESIDENTIAL AND OFFICE SPACE USSERS)
18. MAIN BUILDING ENTRANCE

36M long curved glass atrium to aid in enhancing natural lighting in the commercial spaces in the floors below.

1M deep water feature with dancing fountains included in an aim to enhance the landscaping of the site and create an attraction spot for the users.

7M wide setback as per building regulations of the area used to allow for landscaping of the site.

6M wide dark asphalt vehicular road leading from the open parking to the main gate of the premises.

Reinforced concrete entrance canopy furnished with accent lighting which together with name on it helps highlight the main entrance .

Entrance area furnished with light asphalt finish with an allowance for drop off points for the chauffeured users of the premises.

Non-slip ceramic tile finished corridors allowing for circulation throughout the building.

Outdoor dining outdoor deck area where customers could sit and enjoy various delicacies from the various food outlets within the building.

Courtyard area with planters and seating spaces.Helps increase the dwell time of the users as they relax whilst interacting with other individuals nurturing diverse community interactions.

GROUND FLOOR SPATIAL PROVISIONS

Main spaces provided in the floor are:

- Retail stores inclusive of the anchor tenant.
- Food outlets, restaurants and outdoor dining.
- Courtyard.
- Service spaces: Loading bays and sanitation provisions

With the diversification of the spaces within the same floor, the design would achieve maximum usability by the users due to maximum exposure to other services as they walk around to the their preferred outlets.

Curved shades over the open parking that serve two main purposes
.Minimizes sun effect on the parked vehicles.
.Serves as aesthetic appeal to the parking areas breaking the monotony of vehicle views.

Narrow landscaped areas are left out in various areas to help define the various pathways as well as enhance the aesthetic appeal of the site minimizing the hardscape within the site.

FIRST FLOOR PLAN
SCALE 1:200

Main spaces provided in the floor:

- Retail stores.
- Anchor tenants
- Entertainment spots:Cinema hall
- Fashion and beauty outlets
- Dining spots
- Sanitation spaces

The main anchor tenants for the mall is the bank,health unit and the supermarket running through to first floor.

The reason behind allocating two main anchor tenants was to ensure that the mall remains afloat financially should the outlets not be rented out as hoped.

Also by placing the bank on upper floors it helps ensure maximum exposure of the users to other provided services as they head in search of such crucial services.

It is important to note that as of the cinema hall its design such that it comfortably accommodates even the differently abled users who might be off for a movie date.

Inclusivity was also emphasized in inclusion of vegan restaurants to cater for users who do not go for meat based diets.

VIEW OF THE INDOOR FOOD OUTLETS

VIEW OF THE OUTDOOR RESTAURANT.

Neon lit advertisement boards are used at the entrance of the stores to ease the circulation and location of various stores for the new users.

Floorboard floors are used in the eatery areas as they tend to have a more natural feel enhancing comfort.

SECOND FLOOR PLAN
SCALE 1:200

Main spaces on the second floor can be categorized as:

- Retail stores
- Gaming and fitness amenities
- Fashion and beauty outlets
- Anchor tenant:Health unit

The health unit provided in the building was to serve as a kind of dispensary for the community around with the serious cases being referred to major hospitals around the country.
The fitness amenities were majorly provided to cater for residents who would pay a lesser fee to use which would be included in the rent payments.It would however be open even for non residents but for a bit higher membership fee.
Acoustical insulation was also a key aspect in this floor as it was the last floor of the commercial zone this was in aim to ensure that the residential and offices above operated comfortably with minimal noise disturbance from below.

VIEW OF THE BATHROOM AND WASHROOMS

Modern bathroom facilities adopted giving the spaces an elegant and luxurious feel.

VIEW OF THE KITCHEN AREA PROVIDED

In the provided residential units,the kitchen provided would be fully furnished with all the essential kitchen appliances with an ample storage space provided for the bulk items.
Marble countertops are used for the countertops, kitchen islands and the back splashes which helps achieve elegant look in the spaces.

OFFICE TOWER

Main spaces provided

- Offices spaces to let

This are of 5 typologies each with different furniture arrangement and different included spaces that best serve the layout adopted in each.

- Sanitation and utility spaces.

Five different typologies were provided to cater for the potential diverse client needs that exist when it comes to modern office spaces.

RESIDENTIAL TOWER

Main units provided:

- Studio units
- 1 Bedrooms
- 2 Bedrooms
- 3 Bedrooms
- Duplex units

All are fully equipped and are with a modern touch seen through the choice of furniture, the material selection and finishing selection of the spaces included.

Decorations to be done on the interior walls to minimize the monotony of clean plain walls and instead provide an aesthetic touch.The grooves formed will also play a major role in providing ambient lighting creating very elegant interiors

Furniture selected is of high quality materials such as leather,cotton or linen with glass tables made of hardwood and carpeted marble tiling floors all over.

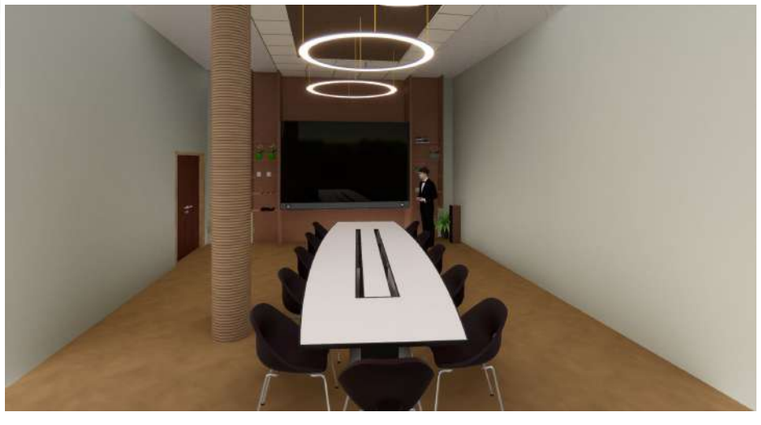
VIEW OF THE DESIGNED BEDROOM UNITS

Custom-made lighting fixtures to be used in the various spaces to give a unique feel instead of the normally used artificial lighting bulbs.Recessed lighting is also to be used on the elegantly designed ceilings

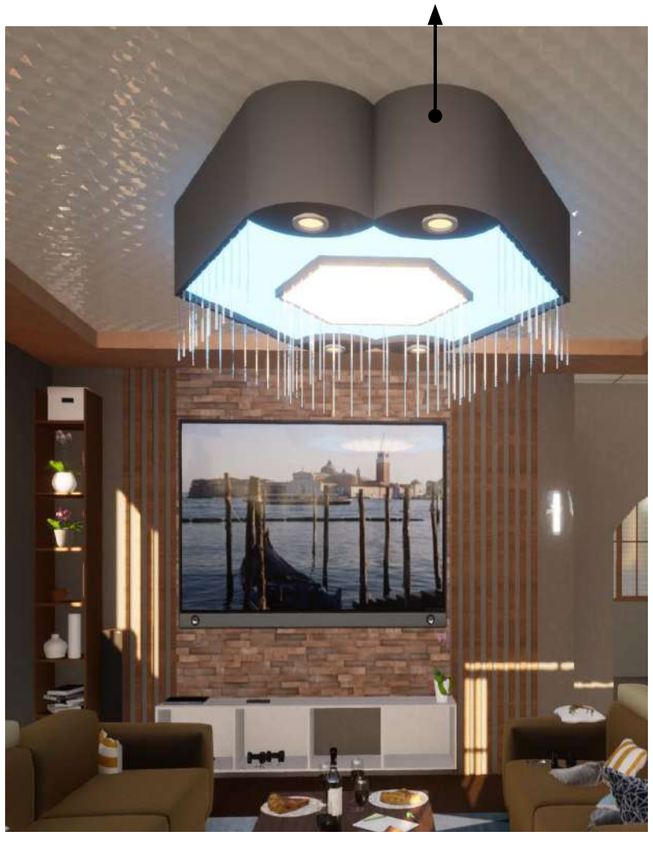
VIEW OF THE SHARED WORKSTATIONS

Kitchenettes and meeting rooms will be provided in this typology to ensure that the team in occupancy of the office is well catered for at all times
Washrooms however and other sanitation spaces will be shared among the floor members.This helps create a chance to form new connections among people sharing the same floor.

VIEW OF THE MANAGERIAL OFFICE.



GLIMPSE OF THE DESIGNED BOARD/MEETING ROOMS



PRESENTATION DRAWING / ELEVATIONS AND 3DS

NORTH ELEVATION
SCALE 1:100

SOUTH ELEVATION
SCALE 1:200

A GLIMPSE OF THE RESTAURANT AREA.

ABOUT THE ELEVATION DESIGNS

Guided by the simplicity concept, the designed aimed at achieving aesthetically pleasing facades with minimal design additions and equally with minimal compromisation of the indoor elements:lighting and ventilation.
To achieve this ,the floor slabs were extended with 100mm and a vegetation allowance of 250mm created in between two 100mm thick masonry wall that would then be used as part of landscaping..A sigmoid was then added on the North and South elevations which mimicked the interchange which neighbours the site to add an aesthetic touch to the facades.
Having done this the design was able to achieve 3 main things:

- **Lighting,ventilation and views**

With the curtain walls running from floor to ceiling with minimal additions on the exterior wall the lighting and views from interior were not interfered with and as of the ventilation allowance for it on the ceiling level of the curtain wall was equally uninterferred.

- **Aesthetic appeal.**

The use of greenery and the sigmoid curve on the facade helped achieve an aesthetic look on the building having not lost the guiding design principle which is simplicity in design.

- **Sustainability**

The inclusion of greenery on the building facade,courtyards in the building and an atrium heavily contributes to the sustainability goals which are being aimed at in the ongoing climate changes

- **Uniqueness in form**

The project site was westlands which is known for curtain walled towers such as the BMW building and the GTC building.The approach however in this design was quite different as unlike the BMW the design managed to hide the curtain walls and instead give landscaped exterior wall facades.This unique makes the building stand out as one of the main landmarks in the area.

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EAST ELEVATION
SCALE 1:200

WEST ELEVATION
SCALE 1:200

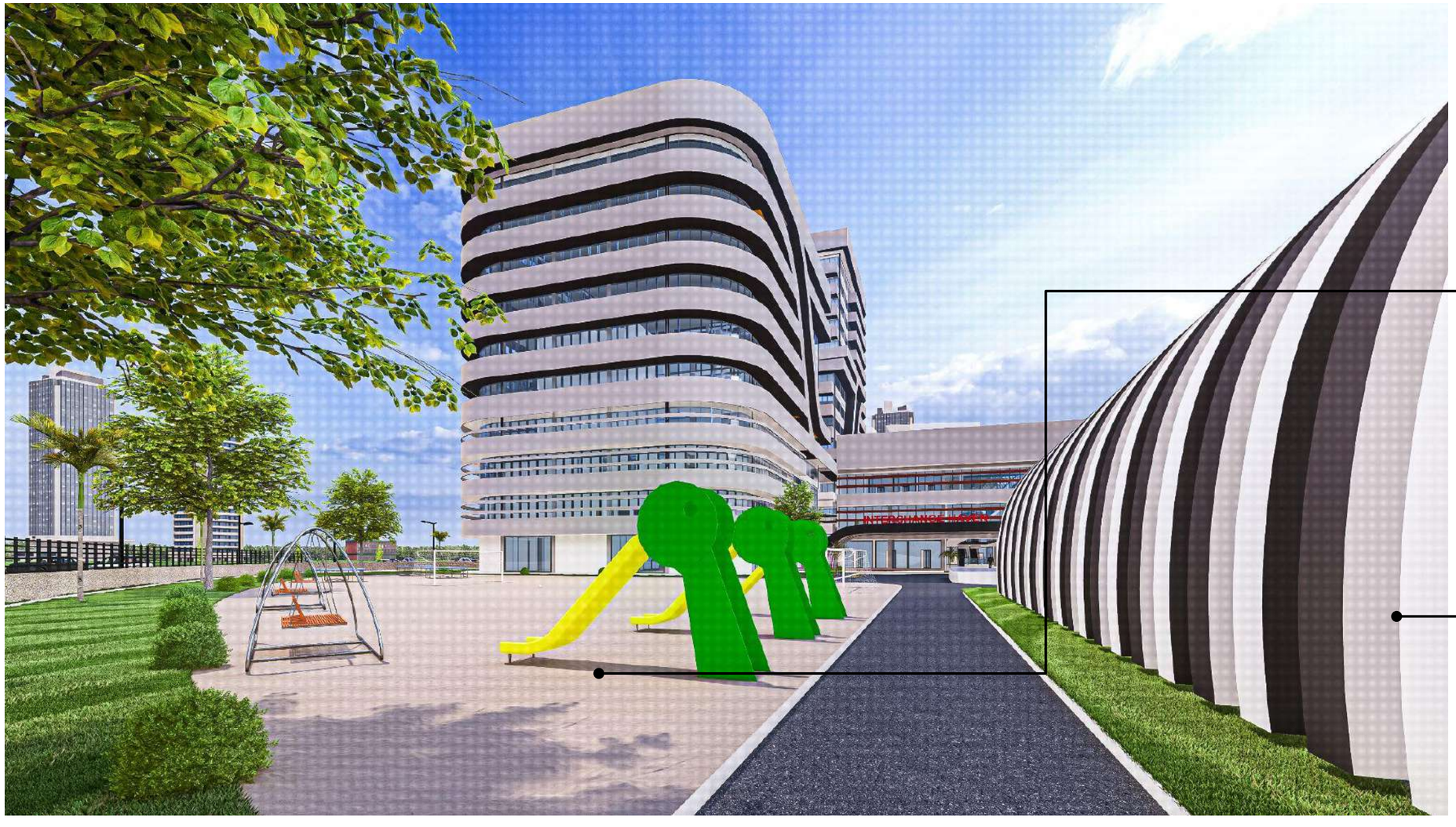
3D MODEL

A rendered computer simulated frame model of the project at the conceptual level.The aim in generating the model was to help better understand the handsketched conceptual 3d that had been done on paper enabling early detection of flaws at an early stage before much progress had been made.This way major correction were done in an aim of making a final design that conformed to the conceptual design proposal

VIEW OF THE PROJECT FROM UHURU HIGHWAY(South side view)

Perspective view of the project from the Uhuru highway-Westlands Rd junction

A VIEW OF OFFICE LOUNGE.



Kids play area which is equipped with slides, swings, trampolines and and bouncing castles .The amenities are to be paid for and a seating area will be provided to allow the parents to comfortably monitor their kids as they play. The area will have rubber flooring to miniminize chances of injuries to the kids as they play.

The site is to be well fenced with a 1500mm high perimeter wall topped with 3000mm high steel bars to clearly demarcate the site boundary, enhance security and also help ensure that the kids playing at the southern side of the site do not stray off to the road

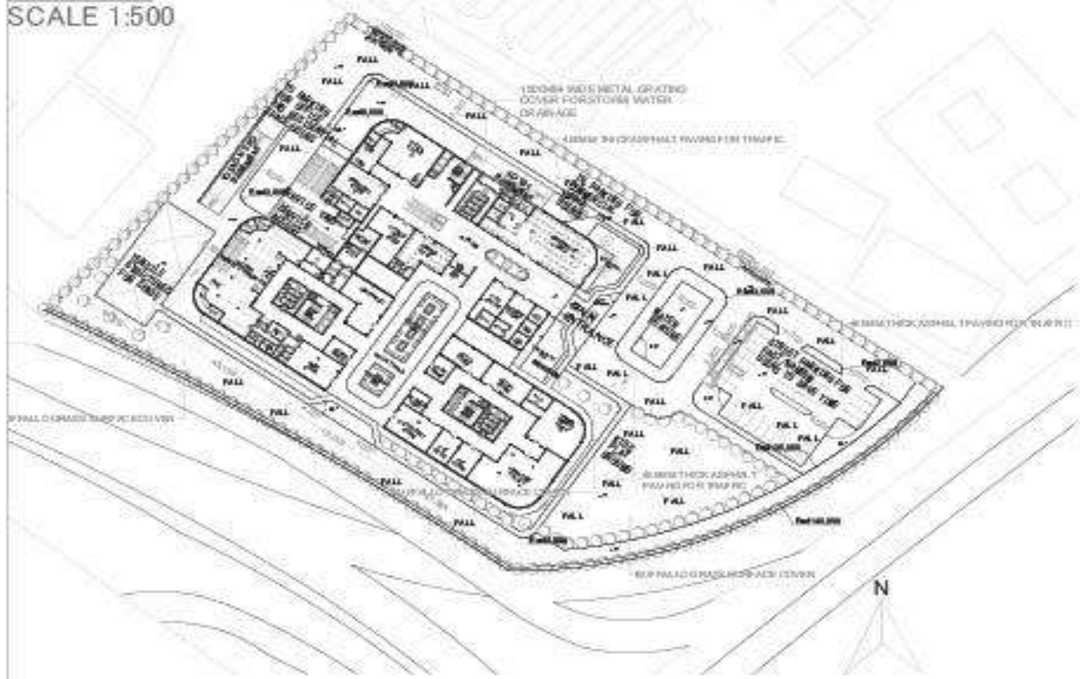
Rear view of the curved canopies shading the open parking areas.

VIEW OF THE PROJECT ENTRANCE FROM THE OPEN PARKING AREA

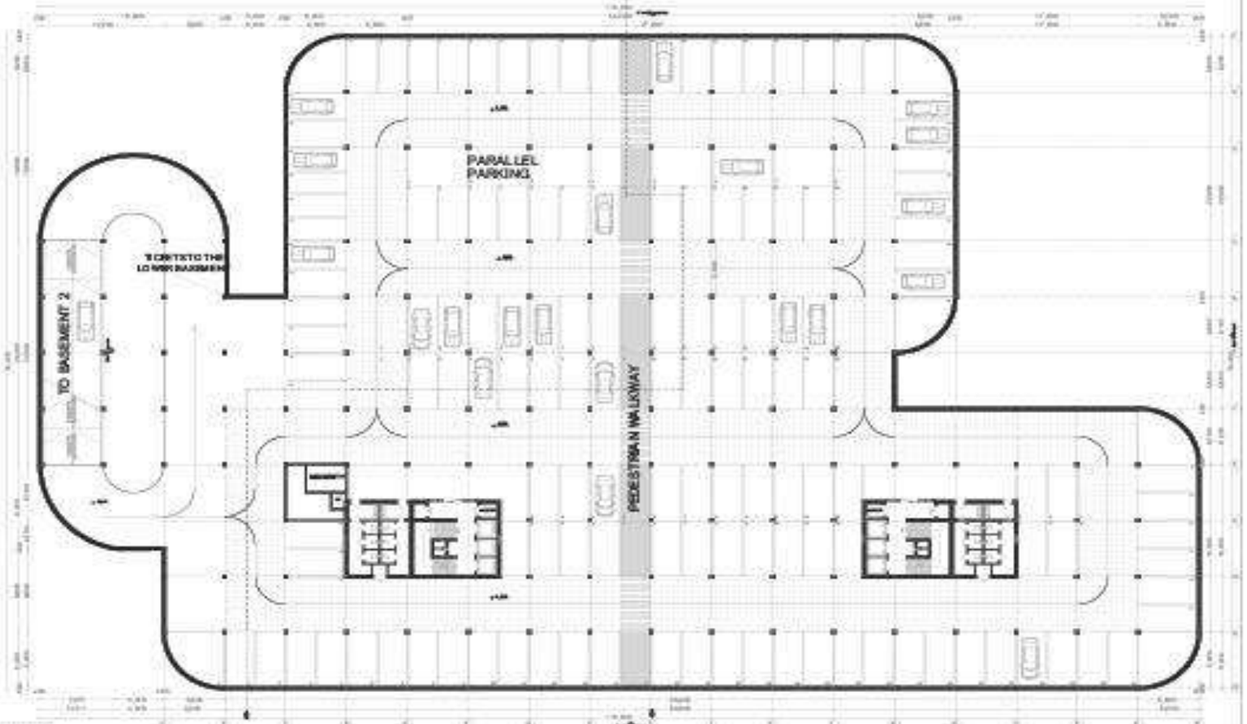
WORKING DRAWING

SITE AND BASEMENT PLANS

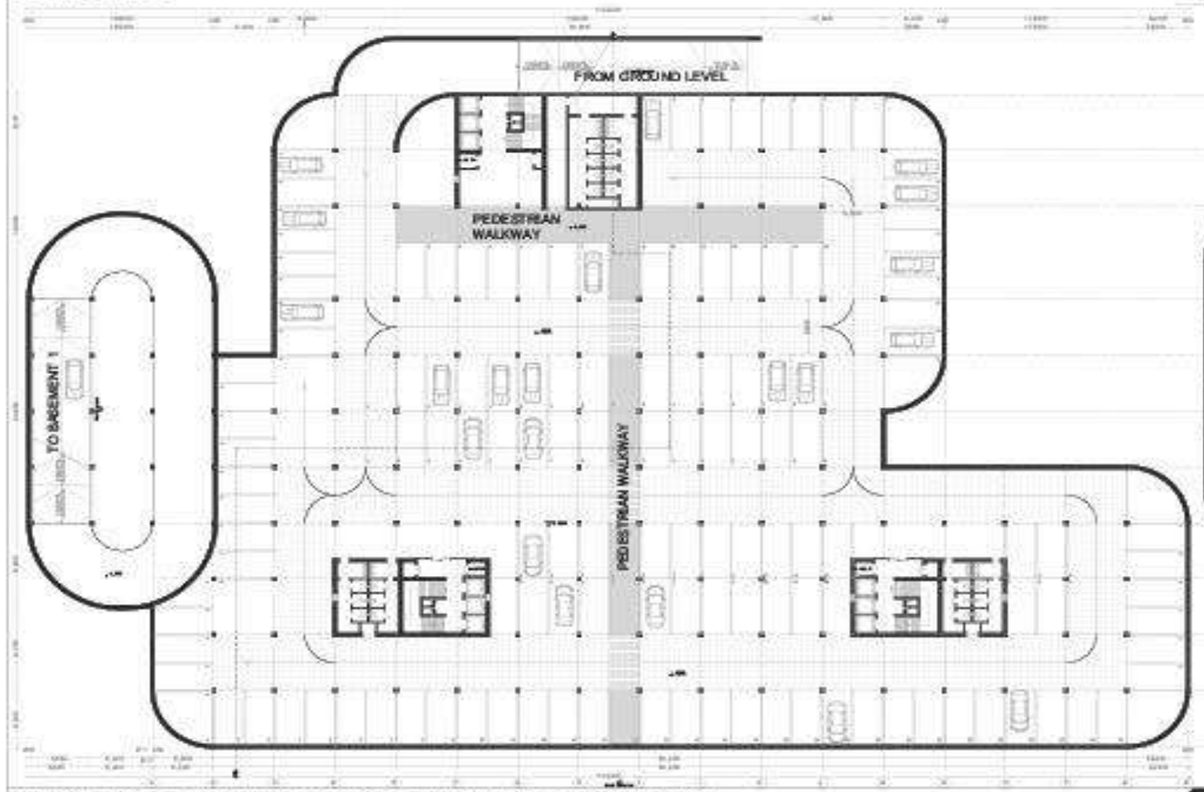
SITE PLAN
SCALE 1:500



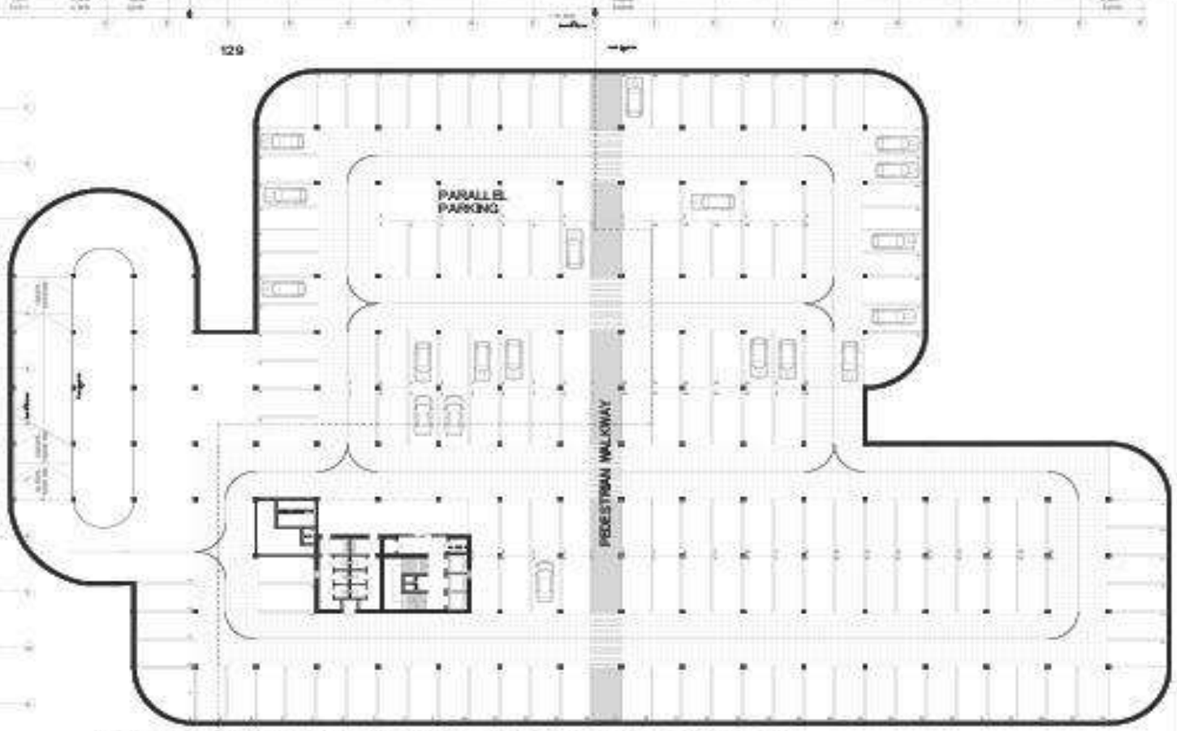
2ND BASEMENT PARKING FLOOR PLAN(Office)
SCALE 1:200



1ST BASEMENT PARKING FLOOR PLAN(Commercial)
SCALE 1:200



3RD BASEMENT PARKING FLOOR PLAN(Residential)
SCALE 1:200



MIXED URBAN-USE DEVELOPMENT

MSHINDI MATARA

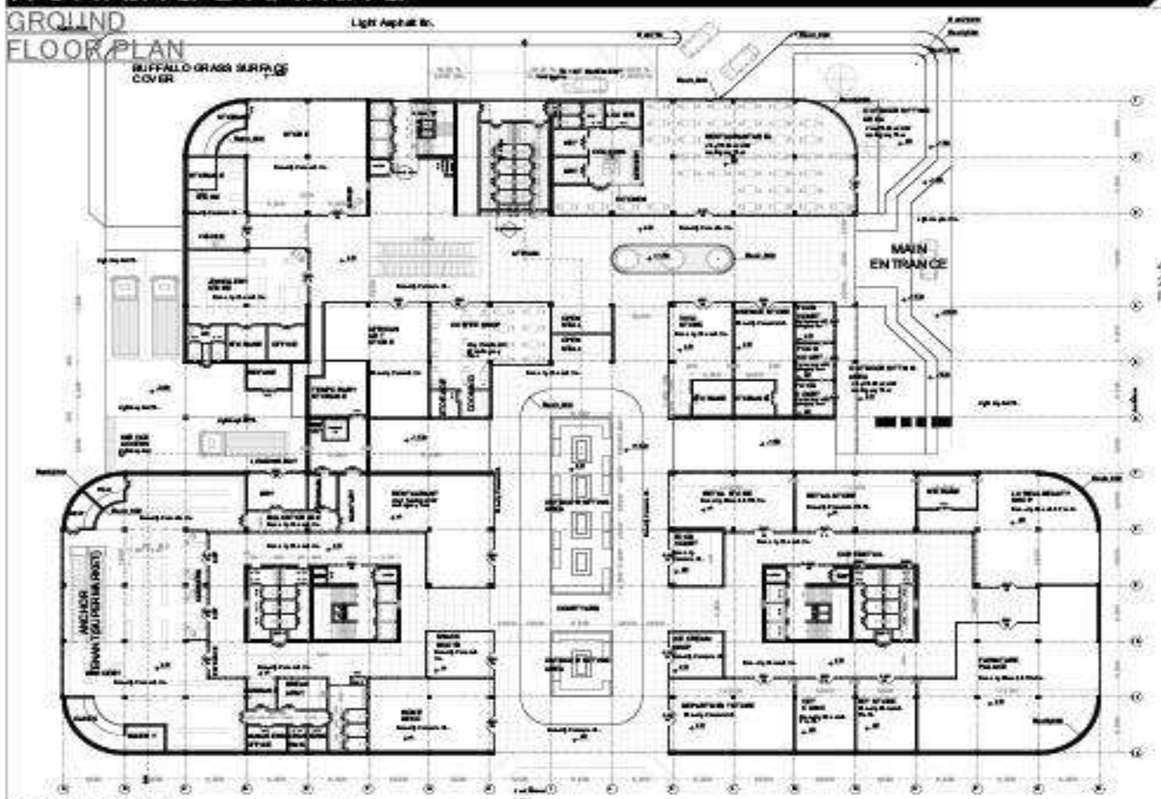
B11/0607/2019

DRAWN BY:
JOB NUMBER:
CHECKED BY:
DATE:

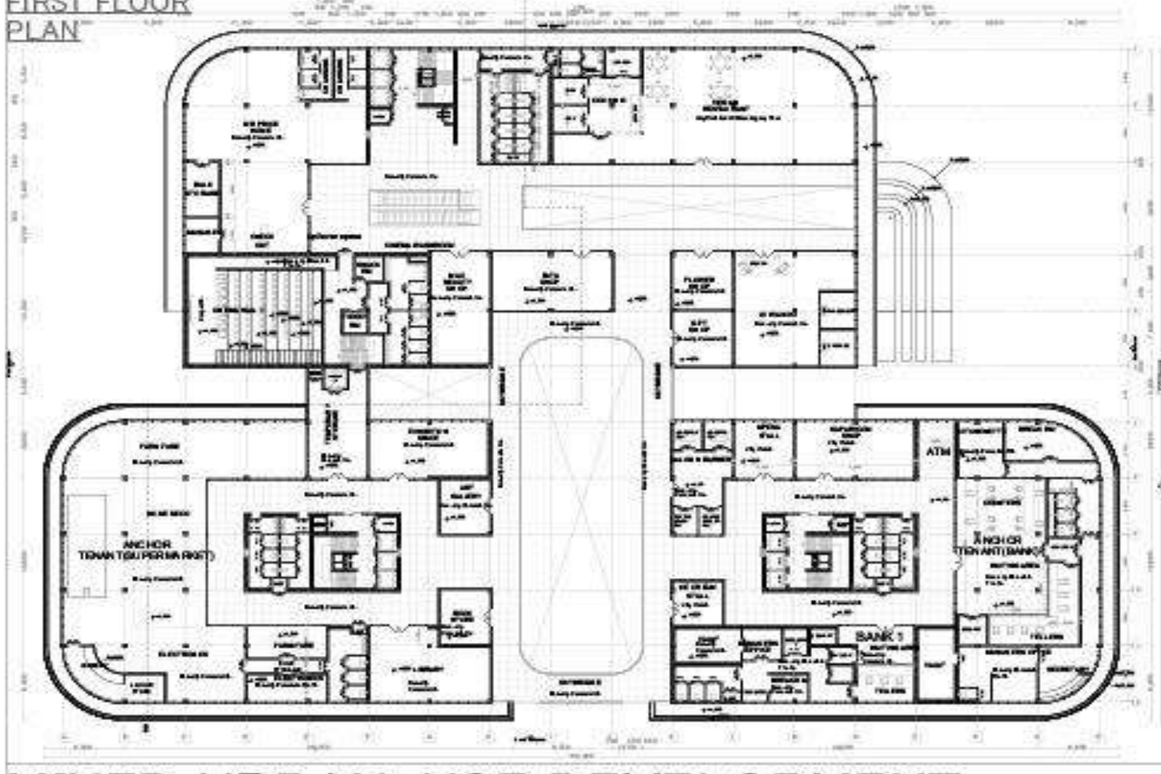
WORKING DRAWING

GROUND AND FIRST FLOOR PLANS

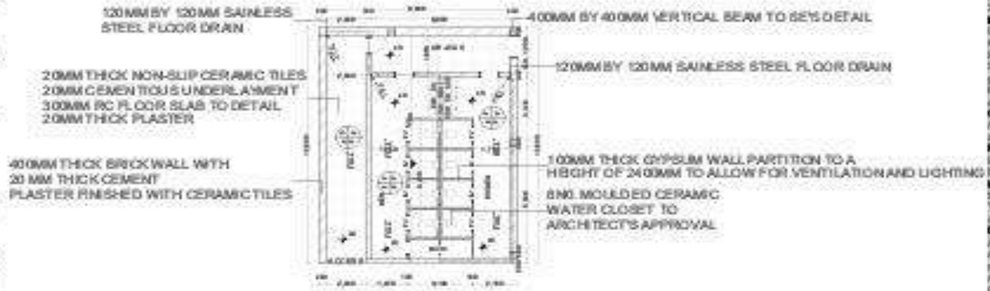
GROUND FLOOR PLAN



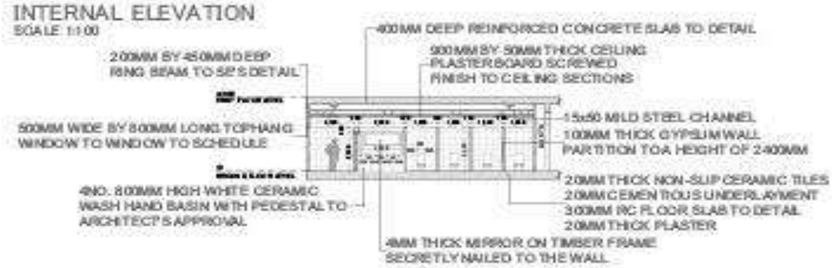
FIRST FLOOR PLAN



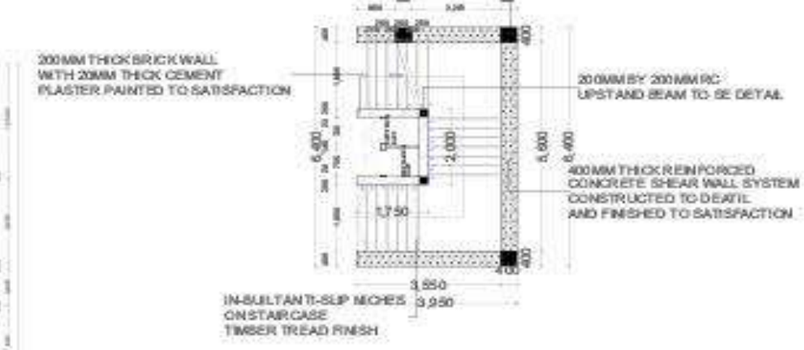
BLOW-UP
MAIN CORE WASHROOMS
SCALE 1:100



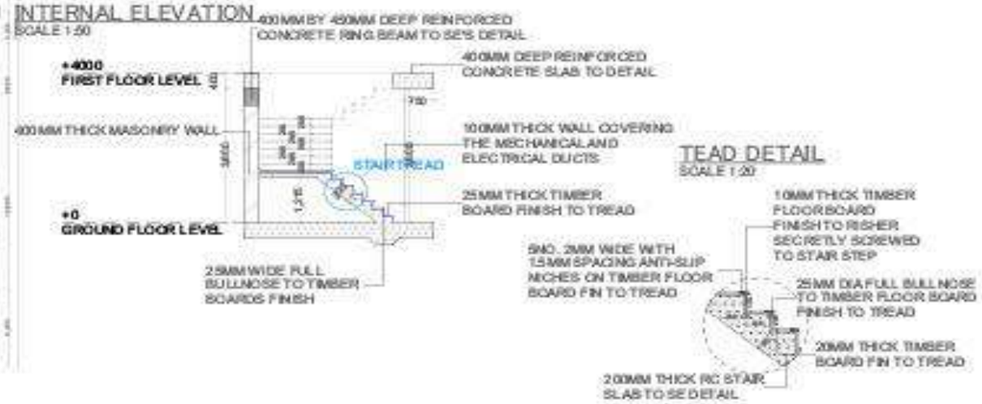
INTERNAL ELEVATION
SCALE 1:100



BLOW-UP
STAIRCASE
SCALE 1:50

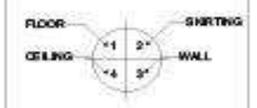


INTERNAL ELEVATION
SCALE 1:50



TEAD DETAIL
SCALE 1:20

GENERAL NOTES
All dimensions to be approved on site and setting out approved by the architect.
Foundation
Stone as per structural drawings.
Depth to be determined on site.
Termidor or equal and approved for anti-termite treatment.
3 layers bituminous felt for DPC
Mortar
Cement and sand mix to structural engineers specifications.
Reinforced Concrete
Structural work shown on architectural drawing is given purely as an indication and will in all cases be superseded by the structural engineer's drawings.
Columns
All columns to be plastered and finished to approval.
Pavement Veins
Be provided over all doors and windows except bathroom doors.
Windows
Metal casement windows to approval.
Tobare 10x10mm cement bother all around to detail.
Drainage and Sanitation
All to the requirements of M.O.H.
All inspection plates to be fitted with gun metal nuts and bolts
All soil and waste pipes laid under walls to be cast iron, encased in 150mm thick concrete surround.
All bends in the system to have accessible inspection eyes.



FINISHES SCHEDULE
Floor Finish:
1a. 100x600x15mm thick HW Mahogany timber floorboards with varnish finish secretly nailed to RC Floor slab.
1b. 300x600x15mm thick vitrified polished non-slip ceramic floor tiles on 15mm thick sand and cement screed.
1c. 600x600x15mm thick non-slip polished porcelain floor tiles on 15mm thick lime, sand and cement screed.
1d. 100 by 600by 15mm thick Polished Engineered wood floor finish on 50 by 100mm timber battens nailed to floor slab.
1e. 600 by 600mm Granite tiles floor finish
1f. 600 by 600mm polished Matt Granite tiles on 30mm cement binding on 150mm RC slab to SE approval.
Skirting Finish:
2a. 600mm long by 100mm high by 15mm deep HW Mahogany timber skirting with varnish finish secretly nailed to brick wall.
2b. 100mm high by 15mm deep vitrified polished ceramic tiles skirting on 15mm thick lime plaster.
2c. 100mm high by 15mm deep polished porcelain tiles skirting on 10mm thick sand and cement plaster.
2d. 100mm high 600mm long and 15mm thick polished engineered wood skirting with glossy vinyl finish.
Wall Finish:
3a. 3mm thick 3 coat layer beige silk vinyl emulsion waterproof paint on 15mm thick wall plaster finish.
3b. 100x600x 10mm thick machine cut Marwari stone wall finish on 15mm thick sand and cement screed finish.
3c. 3mm thick 3 layer coated oak grey wall paint on 15mm thick sand and cement plaster finish.
3d. 250x600x15mm thick vitrified non-slip coloured ceramic wall tiles finish on sand and cement plaster finish.
Ceiling Finish:
4a. 100mm deep by 50mm wide HW oak timber ceiling slats suspended from slab soffit.
4b. 12mm thick gypsum ceiling board suspended from slab soffit at 2315mm above FFL.
4c. 100x600x15mm thick HW oak timber ceiling boards secretly nailed to timber battens on slab soffit
4d. 3mm 3 coated layer white paint finish on 15mm thick plaster finish on slab soffit

PROJECT TITLE: A PROPOSED MIXED URBAN USE DEVELOPMENT A TING'ARUM HILL IN WESTLANDS AREA IN NAIROBI

DRAWING TITLE: GROUND AND FIRST FLOOR PLANS

DRAWING SCALE: SCALE 1:500, 50, 20

DRAWN BY:
JOB NUMBER:
CHECKED BY:
DATE:

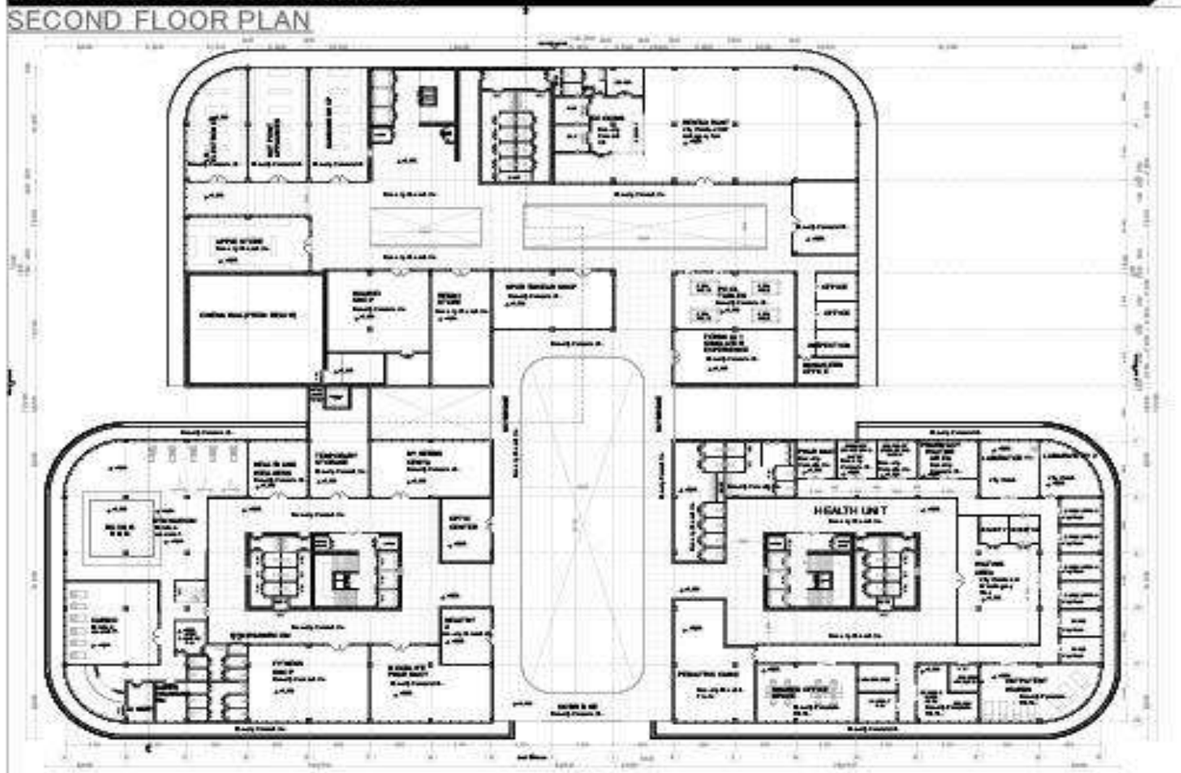
MIXED URBAN-USE DEVELOPMENT

MSHINDI MATARA

B11/0607/2019

WORKING DRAWING

SECOND FLOOR PLAN



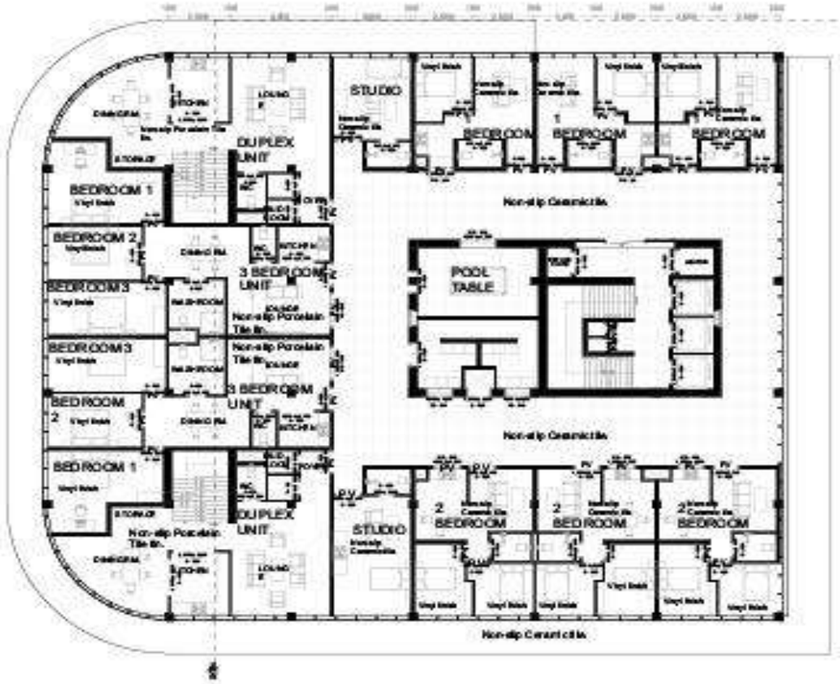
THIRD, FIFTH AND SEVENTH FLOOR PLANS

FORTH, SIXTH AND EIGHTH FLOOR PLANS

2ND THROUGH 14TH FLOORS

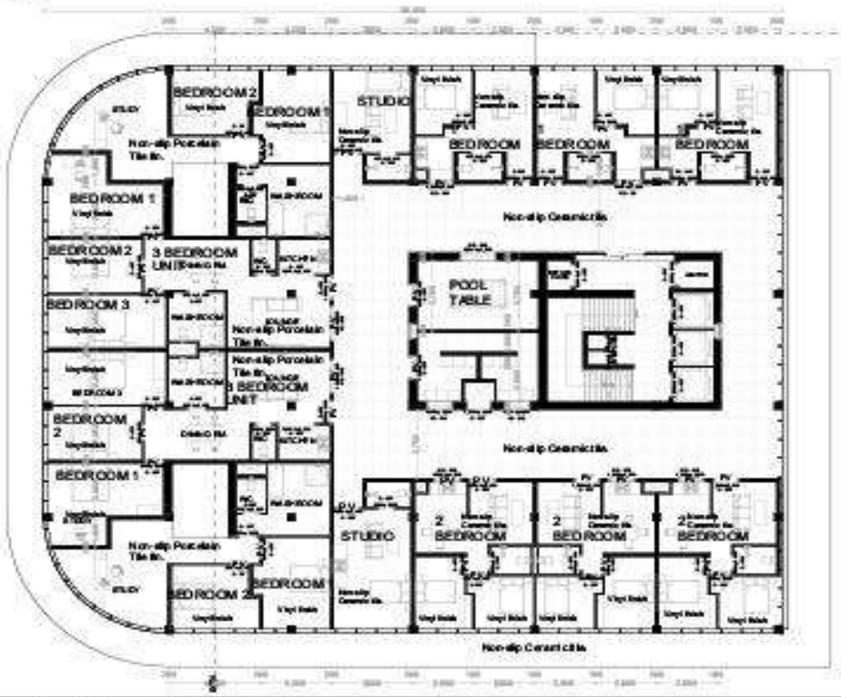
NINETH, ELEVENTH AND THIRTEENTH FLOORS

SCALE 1:100



TENTH, TWELVETH AND FORTEENTH FLOORS

SCALE 1:100



GENERAL NOTES

All dimensions to be approved on site and setting out approved by the architect.

Foundation

Stone as per structural drawings.
Depth to be determined on site.
Termicor or equal and approved for anti-termite treatment.
3 layers bituminous felt for DPC

Mortar

Cement and sand mix to structural engineers specifications.

Reinforced Concrete

Structural work shown on architectural drawing is given purely as an indication and will in all cases be superseded by the structural engineer's drawings.

Columns

All columns to be plastered and finished to approval.

Pest and Vents

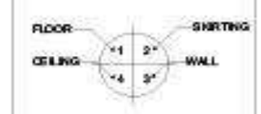
Be provided over all doors and windows except bathroom doors.

Windows

Metal casement windows to approval.
Tobare 30x15mm cement bother all around to detail.

Drainage and Sanitation

All to the requirements of M.O.H.
All inspection plates to be fitted with gun metal nuts and bolts
All soil and waste pipes laid under walls to be cast iron, encased in 150mm thick concrete surround.
All service in the cistern to have accessible inspection eye.



FINISHES SCHEDULE

Floor Finish:

1a. 100x600x15mm thick HW Mahogany timber floorboards with varnish finish secretly nailed to RC Floor slab.
1b. 300x600x15mm thick vitrified polished non-slip ceramic floor tiles on 15mm thick sand and cement screed.
1c. 600x600x15mm thick non-slip polished porcelain floor tiles on 15mm thick fine, sand and cement screed.
1d. 100 by 600by 15mm thick Polished Engineered wood floor finish on 30 by 100mm timber battens nailed to floor slab.
1e. 600 by 600mm Granite tiles floor finish
1f. 600 by 600mm polished Mahl Granite tiles on 30mm cement binding on 150mm R.C slab to SE approval.

Skirting Finish:

2a. 600mm long by 100mm high by 15mm deep HW Mahogany timber skirting with varnish finish secretly nailed to brick wall.
2b. 100mm high by 15mm deep vitrified polished ceramic tiles skirting on 10mm thick fine plaster.
2c. 100mm high by 15mm deep polished porcelain tiles skirting on 10mm thick sand and cement plaster.
2d. 100mm high 600mm long and 15mm thick polished engineered wood skirting with glossy vinyl finish.

Wall Finish:

3a. 3mm thick 3 coat layer beige silk vinyl emulsion waterproof paint on 15mm thick wall plaster finish.
3b. 100x50x10mm thick machine cut Marsabit stone wall finish on 15mm thick sand and cement screed finish.
3c. 3mm thick 3 layer coated dark grey wall paint on 10mm thick sand and cement plaster finish.
3d. 250x600x15mm thick vitrified non-slip polished ceramic wall tiles finish on sand and cement plaster finish.

Ceiling Finish

4a. 100mm deep by 50mm wide HW oak timber ceiling slats suspended from slab soffit.
4b. 12mm thick gypsum ceiling board suspended from slab soffit at 2.15mm above FFL.
4c. 100x600x15mm thick HW oak timber ceiling boards secretly nailed to timber battens on slab soffit
4d. 3mm 3 coated layer white paint finish on 10mm thick plaster finish on slab soffit

PROJECT TITLE: A PROPOSED MIXED URBAN USE DEVELOPMENT AT KILIMANI HILL IN WESTLANDS AREA IN NAIROBI

DRAWING TITLE: 2ND THROUGH 14TH FLOORS

DRAWING SCALE: SCALE 1:200, 100

DRAWN BY:

JOB NUMBER:

CHECKED BY:

DATE:

MIXED URBAN-USE DEVELOPMENT

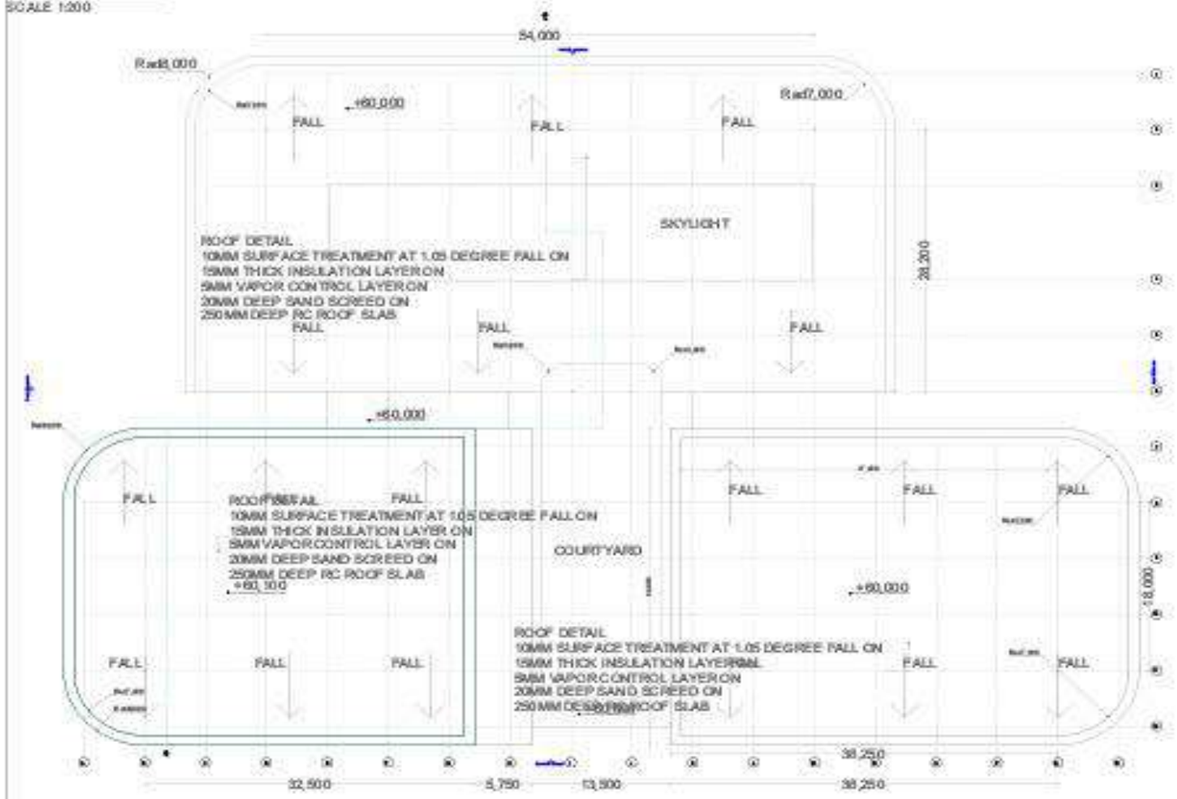
MSHINDI MATARA

B11/0607/2019

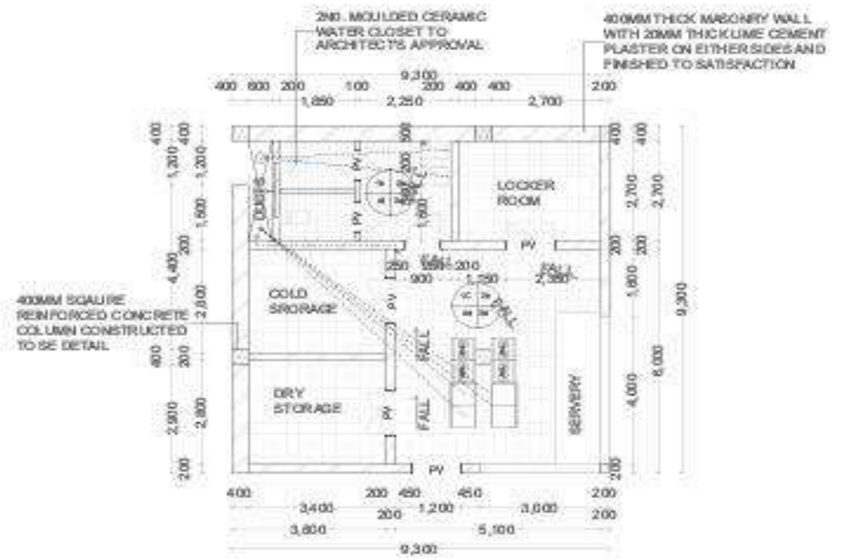
WORKING DRAWING

ROOF PLAN, BLOW-UP AND DETAIL

ROOF PLAN
SCALE 1:200

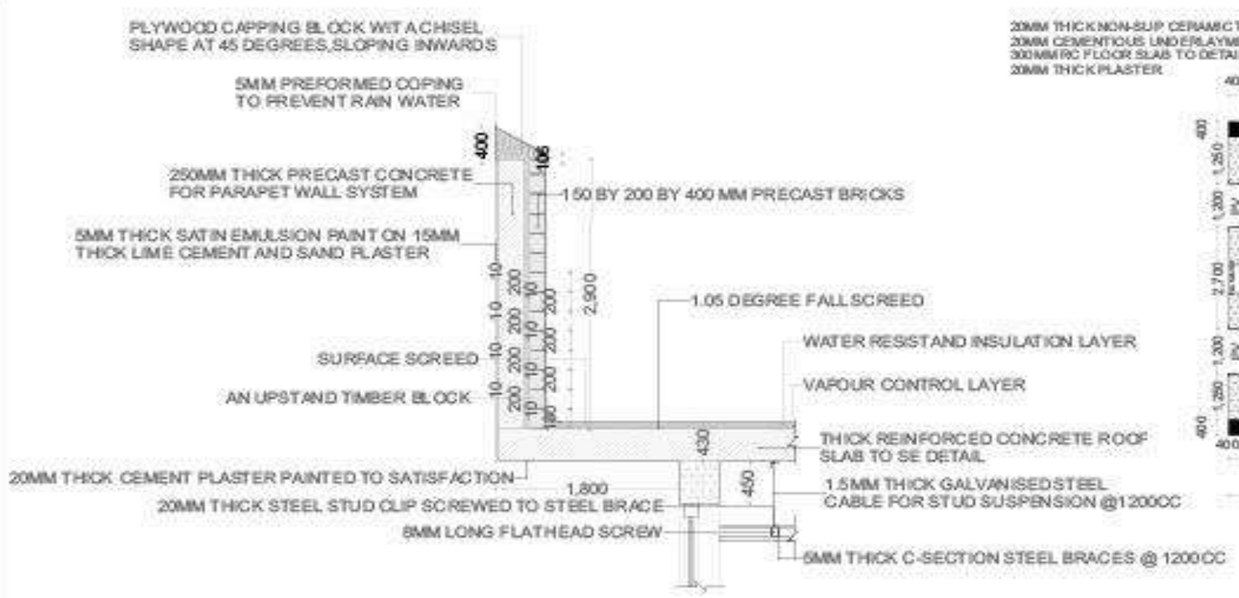


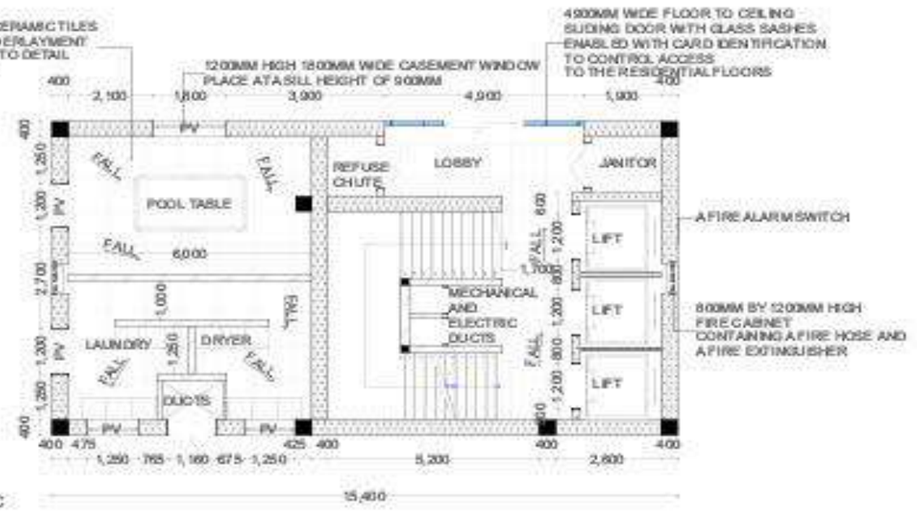
BLOW-UP
RESTAURANT KITCHEN
SCALE 1:50



BLOW-UP
RESIDENTIAL TOWER CORE
SCALE 1:50

FLAT ROOF DETAIL
SCALE 1:20





GENERAL NOTES
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Drainage and Ventilation
All to the requirements of M.O.H.
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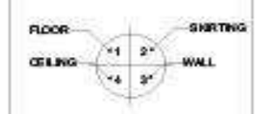
All soil and waste pipes laid under walls to be cast iron, encased in 150mm thick concrete surround.
All bends in the system to have accessible inspection eye.



FINISHES SCHEDULE
Floor Finish:
1a. 100x600x15mm thick HW Mahogany timber floorboards with varnish finish secretly nailed to RC Floor slab.
1b. 300x600x15mm thick vitrified polished non-slip ceramic floor tiles on 15mm thick sand and cement screed.
1c. 600x600x15mm thick non-slip polished porcelain floor tiles on 15mm thick lime, sand and cement screed.
1d. 100 by 600by 15mm thick Polished Engineered wood floor finish on 38 by 100mm timber battens nailed to floor slab.
1e. 600 by 600mm Granite tiles floor finish
1f 600 by 600mm polished Mat Granite tiles on 30mm cement binding on 150mm RC slab to SE approved.
Skirting Finish:
2a. 600mm long by 100mm high by 15mm deep HW Mahogany timber skirting with varnish finish secretly nailed to brick wall.
2b. 100mm high by 15mm deep vitrified polished ceramic tiles skirting on 15cm thick lime plaster.
2c. 100mm high by 15mm deep polished porcelain tiles skirting on 15cm thick sand and cement plaster.
2d. 100mm high 600mm long and 15mm thick polished engineered wood skirting with glossy vinyl finish.
Wall Finish:
3a. 3mm thick 3 coat layer beige silk vinyl emulsion waterproof paint on 15mm thick wall plaster finish.
3b. 100x60x 10mm thick machine cut Marmari stone wall finish on 15mm thick sand and cement screed finish.
3c. 3mm thick 3 layer coated oak grey wall paint on 15mm thick sand and cement plaster finish.
3d. 250x600x15mm thick vitrified non-slip colored ceramic wall tiles finish on sand and cement plaster finish.
Ceiling Finish:
4a. 100mm deep by 50mm wide HW oak timber ceiling slats suspended from slab soffit.
4b. 12mm thick gypsum ceiling board suspended from slab soffit at 2315mm above FFL.
4c. 100x600x15mm thick HW oak timber ceiling boards secretly nailed to timber battens on slab soffit.
4d. 3mm 3 coated layer white paint fixed on 15mm thick plaster finish on slab soffit

PROJECT TITLE: A PROPOSED MIXED URBAN USE DEVELOPMENT AT MUSHINDI HILL IN WESTLANDS AREA IN NAIROBI

DRAWING TITLE: ROOF PLAN, BLOW UP AND DETAIL

DRAWING SCALE:
SCALE 1:100, 50, 20

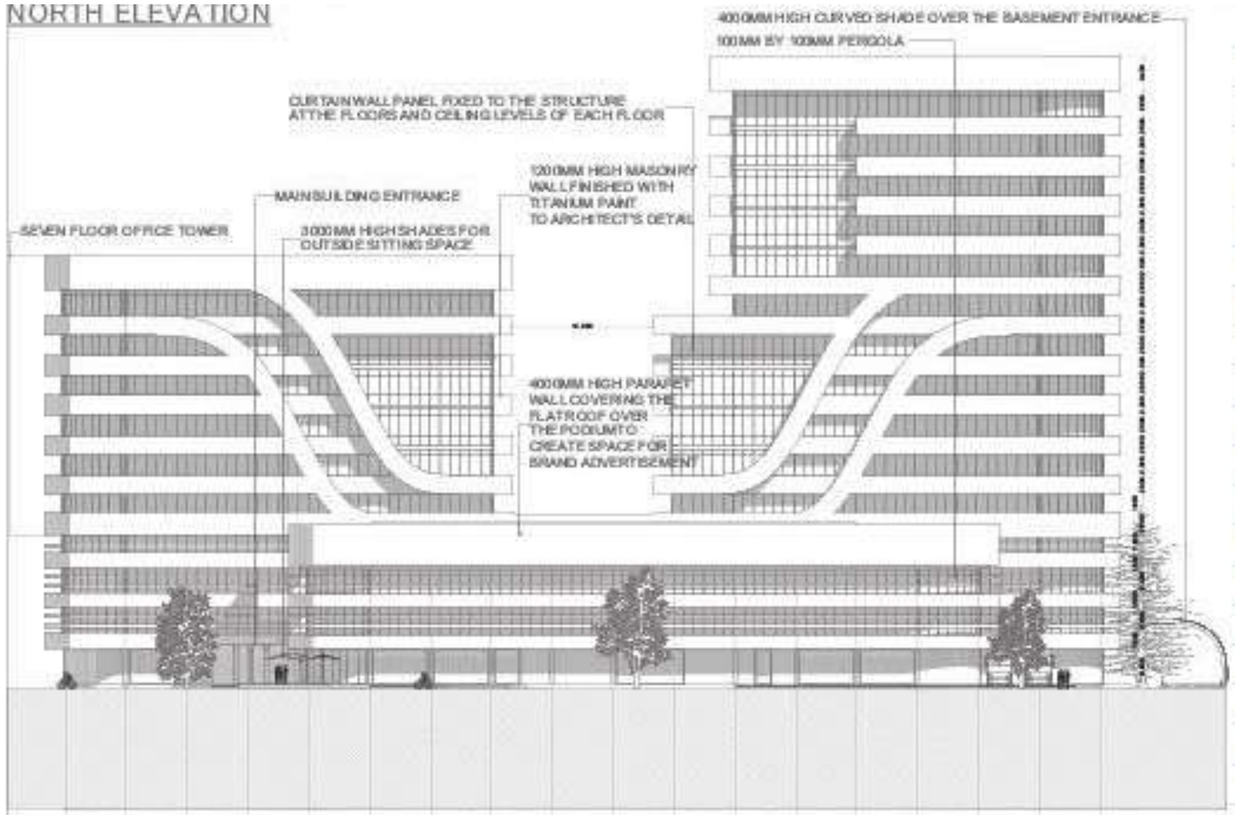
DRAWN BY:
JOB NUMBER:
CHECKED BY:
DATE:

MIXED URBAN-USE DEVELOPMENT

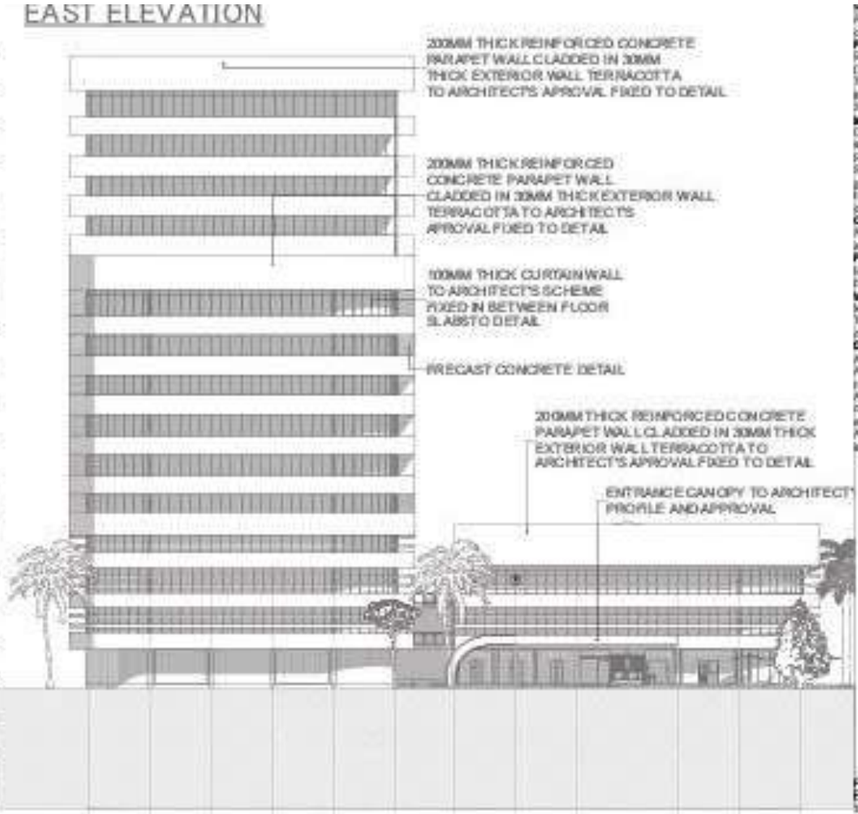
MSHINDI MATARA

B11/0607/2019

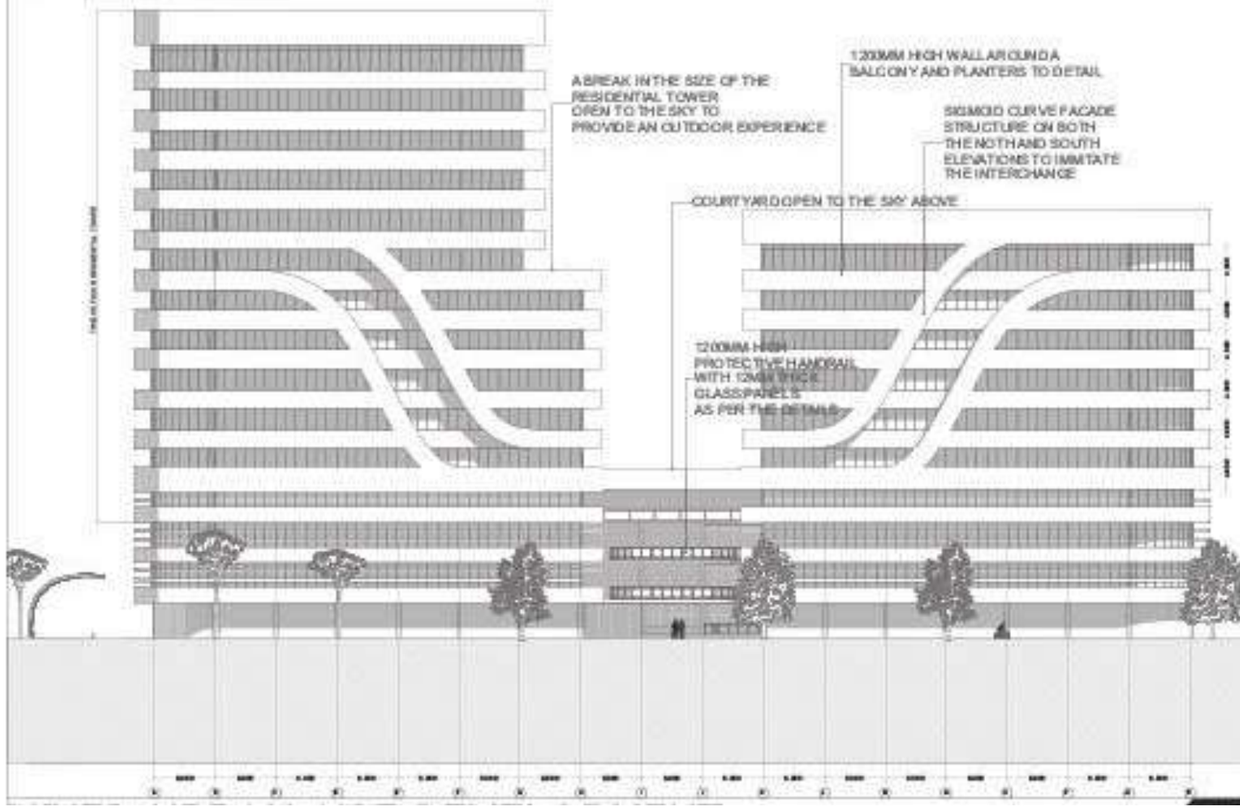
NORTH ELEVATION



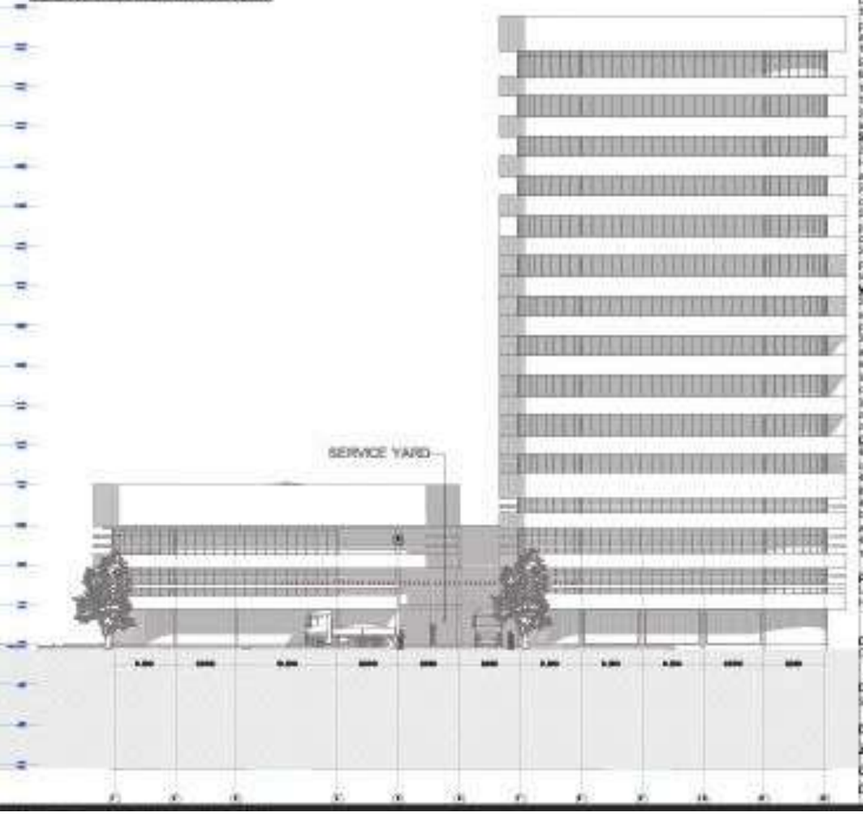
EAST ELEVATION



SOUTH ELEVATION



WEST ELEVATION



Site Clearance Works
All excavations to be approved on site and setting out approved by the architect.
Foundation
Stone as on structural drawings.
Depth to be determined on site.
Termidor or equal and approved for anti-termite treatment.
3 layers bituminous felt for DPC
Mortar
Cement and sand mix to structural engineers specifications.
Reinforced Concrete
Structural work shown on architectural drawing is given purely as an indication and all to all cases be superseded by the structural engineer's drawings.
Columns
All columns to be plastered and finished to approval.
Pavement Vents
Be provided over all doors and windows except bathroom doors.
Windows
Metal casement windows to approval.
Tobare Rustform cement bonder all around to detail.
Drainage and Sanitation
All to the requirements of M.O.H
All inspection plates to be fitted with gun metal nuts and bolts
All sink and waste pipes laid under walls to be cast iron encased in 150mm thick concrete surround.
All bends in the system to have accessible inspection eyes.

FLOOR			SKIRTING
CEILING	1	2	WALL
	4	3	

FINISHES SCHEDULE
Floor Finish:
1a. 300x600x15mm thick HW Mahogany timber floorboards with wax/oil finish secretly nailed to RC Floor slab.
1b. 300x600x15mm thick vitrified polished non-slip ceramic floor tiles on 15mm thick sand and cement screed.
1c. 600x600x15mm thick non-slip polished porcelain floor tiles on 15mm thick lime, sand and cement screed.
1d. 100 by 600by 15mm thick Polished Engineered wood floor finish on 50 by 150mm timber battens nailed to floor slab.
1e. 800 by 600mm Granite tiles floor finish 11 600 by 600mm polished Matt Granite tiles on 25mm cement binding on 150mm RC slab to S/E approval.
Skirting Finish:
2a. 600mm long by 100mm high by 10mm deep H/W Mahogany timber skirting with varnish finish secretly nailed to brick wall.
2b. 100mm high by 12mm deep vitrified polished ceramic tiles skirting on 10mm thick lime plaster.
2c. 100mm high by 18mm deep polished porcelain tiles skirting on 10mm thick sand and cement plaster.
2d. 100mm high 600mm long and 10mm thick polished engineered wood skirting with glossy oil finish.
Wall Finish:
3a. 2mm thick 3 coat tayer beige silk vinyl emulsion waterproof paint on 15mm thick wall plaster finish.
3b. 100x60x10mm thick machine cut Materials stone wall finish on 15mm thick sand and cement screed finish.
3c. 3mm thick 3 layer coated dark grey wall paint on 10mm thick sand and cement plaster finish.
3d. 250x250x15mm thick vitrified non-slip colored ceramic wall tiles finish on sand and cement plaster finish.
Ceiling Finish:
4a. 100mm deep by 50mm wide H/W oak timber ceiling slats suspended from slab soffit.
4b. 12mm thick gypsum ceiling board suspended from slab soffit at 2315mm above FFL.
4c. 150x150x15mm thick H/W oak timber ceiling boards secretly nailed to timber battens on slab soffit
4d. 3mm 3 coated layer white paint finish on 15mm thick plaster finish on slab soffit

PROJECT TITLE: A PROPOSED MIXED URBAN USE DEVELOPMENT AT THIKA SEVEN HILL IN WESTLANDS AREA IN NAIROBI

DRAWING TITLE: ELEVATION DETAIL

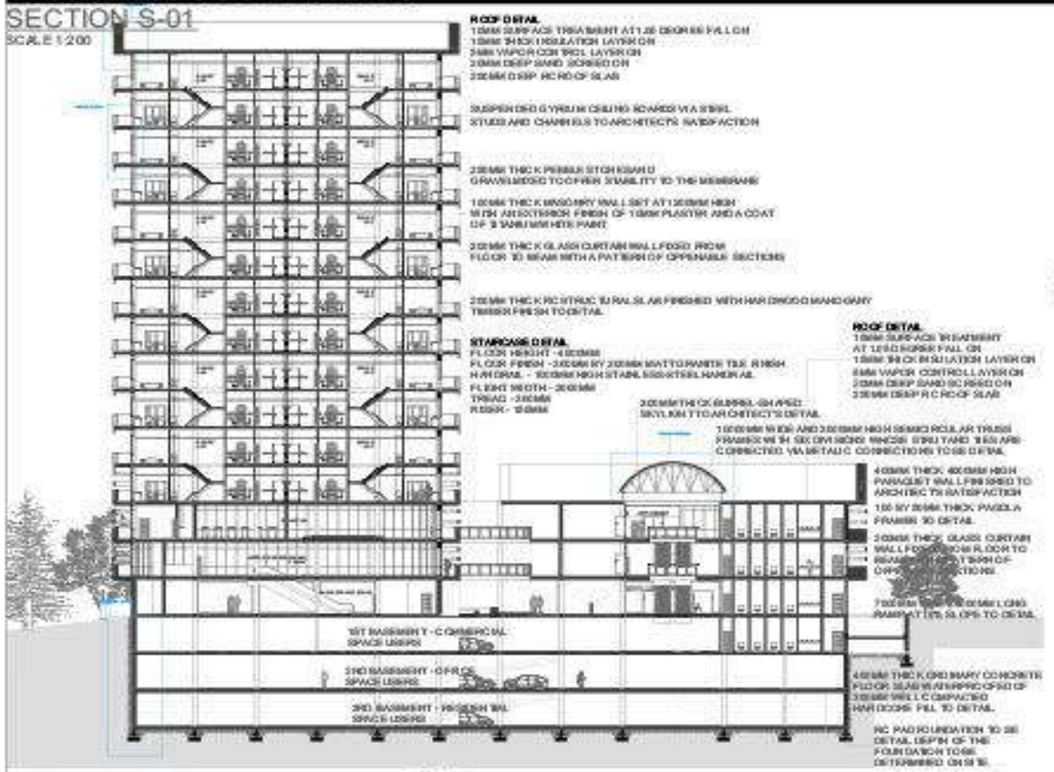
DRAWING SCALE:
SCALE 1:200

DRAWN BY:
JOB NUMBER:
CHECKED BY:
DATE:

WORKING DRAWING

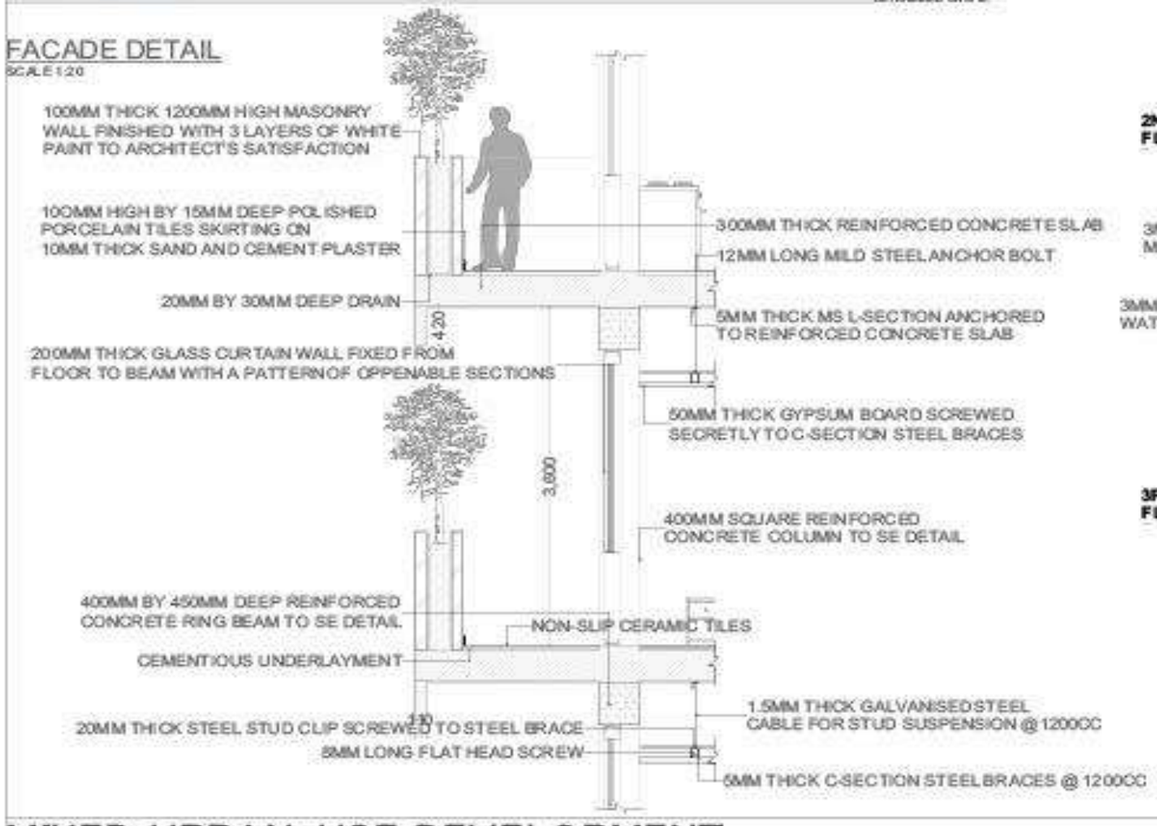
SECTION S-01

SCALE 1:200



FACADE DETAIL

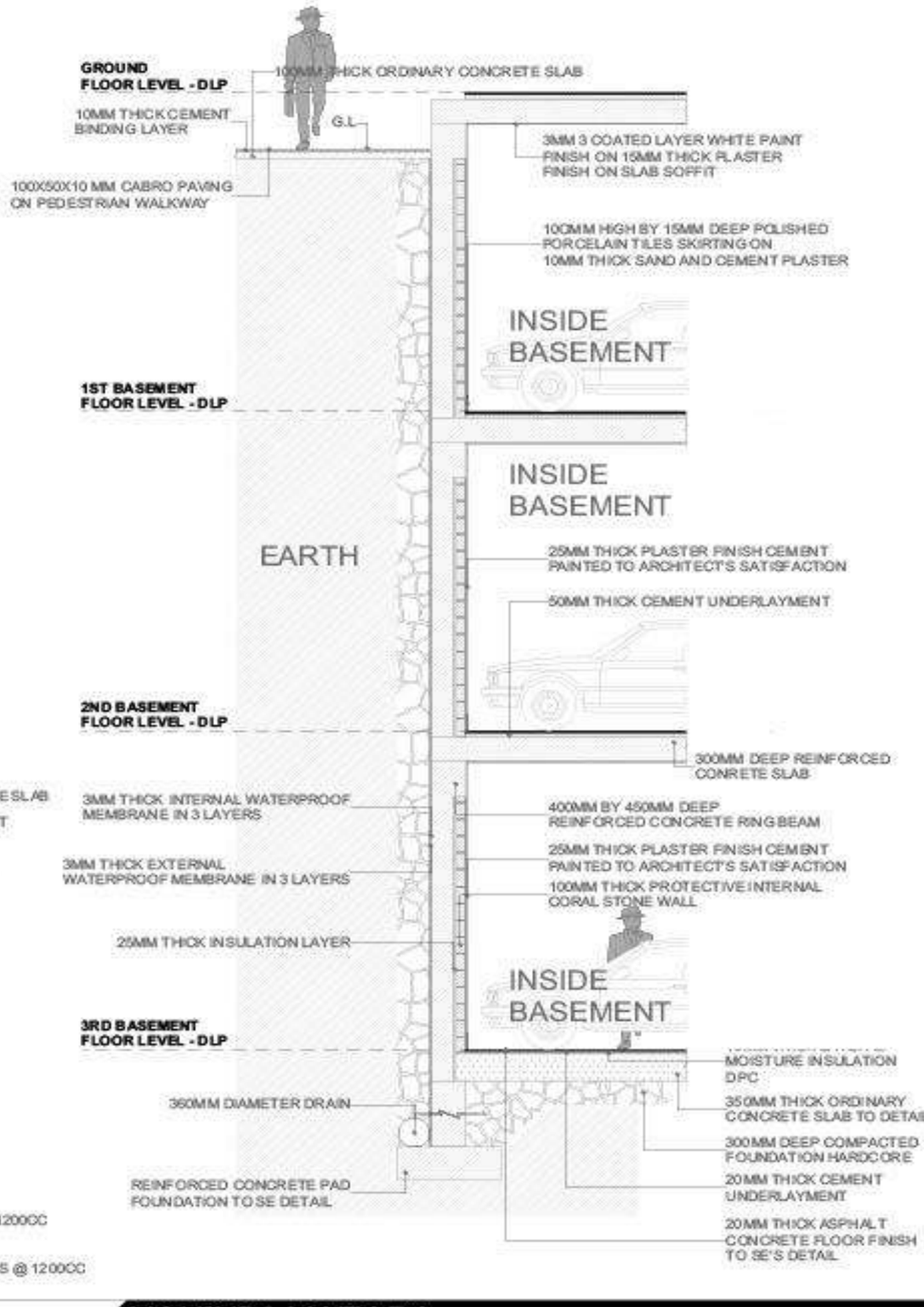
SCALE 1:20



SECTION S-01

BASEMENT WALL AND FOUNDATION DETAIL

SCALE 1:20



GENERAL NOTES

All dimensions to be approved on site and setting out approved by the architect.

Foundation
Refer all on structural drawings.
Depth to be determined on site.
Termidor or equal and approved for anti termite treatment.
3 layers bituminous felt for DPC

Mortar
Cement and sand mix to structural engineers specifications.

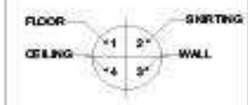
Reinforced Concrete
Structural work shown on architectural drawing is given purely as an indication and will in all cases be superseded by the structural engineer's drawings.

Columns
All columns to be plastered and finished to approval.

Paint and Varnish
Be provided over all doors and windows except bathroom doors.

Windows
Metal casement windows to approval.
To have 10x10mm cement bolter all around to detail.

Drainage and Sanitation
All to the requirements of M.O.H.
All inspection plates to be fitted with gun metal nuts and bolts
All soil and waste pipes laid under walls to be cast iron, encased in 150mm thick concrete surround.
All bends in the cement to have accessible inspectionops.



FINISHES SCHEDULE

Floor Finish:
1a. 100x600x15mm thick HW Mahogany timber floorboards with varnish finish secretly nailed to RC Floor slab.
1b. 300x600x15mm thick vitrified polished non-slip ceramic floor tiles on 15mm thick sand and cement screed.
1c. 600x600x15mm thick non-slip polished porcelain floor tiles on 15mm thick lime, sand and cement screed.
1d. 100 by 600by 15mm thick Polished Engineered wood floor finish on 50 by 100mm timber battens nailed to floor slab.
1e. 800 by 600mm Granite tiles floor finish
1f 900 by 900mm polished Matt Granite tiles on 20mm cement binding on 150mm RC slab to SE approval.

Skirting Finish:
2a. 600mm long by 100mm high by 15mm deep HW Mahogany timber skirting with varnish finish secretly nailed to brick wall.
2b. 100mm high by 15mm deep vitrified polished ceramic tiles skirting on 15mm thick lime plaster.
2c. 100mm high by 15mm deep polished porcelain tiles skirting on 15mm thick sand and cement plaster.
2d. 100mm high 600mm long and 15mm thick polished engineered wood skirting with glossy vinyl finish.

Wall Finish:
3a. 3mm thick 3 coat layer beige silk vinyl emulsion waterproof paint on 15mm thick wall plaster finish.
3b. 100x50x10mm thick machine cut internal stone wall finish on 15mm thick sand and cement screed finish.
3c. 3mm thick 3 layer coated oil& grey wall paint on 15mm thick sand and cement plaster finish.
3d. 250x600x15mm thick vitrified non-slip polished ceramic wall tiles finish on sand and cement plaster finish.

Ceiling Finish
4a. 100mm deep by 50mm wide HW oak timber ceiling slats suspended from slab soffit.
4b. 12mm thick gypsum ceiling board suspended from slab soffit at 2.015mm above FFL.
4c. 100x600x15mm thick HW oak timber ceiling boards secretly nailed to timber battens on slab soffit
4d. 3mm 3 coated layer white paint finish on 15mm thick plaster finish on slab soffit

PROJECT TITLE: A PROPOSED MIXED URBAN USE DEVELOPMENT A THIKA SUB HILL IN WESTLANDS AREA IN NAIROBI

DRAWING TITLE: SECTIONAL DETAIL

DRAWING SCALE: SCALE 1:100, 20

DRAWN BY:

JOB NUMBER:

CHECKED BY:

DATE:

MIXED URBAN-USE DEVELOPMENT

MSHINDI MATARA

B11/0607/2019

NAME: , Prudence Neema Kageriza BAS IV

INSTITUTION: Department of Architecture & Interior Design (DAID), Faculty of Engineering and Architecture (SEA), Kenyatta University (KU).

EMAIL: kagerizaprudence@gmail.com

BIOGRAPHY:

Prudence has recently completed her degree in architectural studies in the Department of Architecture and Interior Design of the Kenyatta University. In her four years of study, She has grown her technical skills, becoming proficient in computer-aided design (CAD) software and 3D modeling. She has also developed a strong foundation in architectural history, theory, and building systems. Her design projects have explored a range of building typologies, from residential homes to commercial and institutional buildings. Beyond the classroom,Prudence has been actively involved in leadership, serving as the class representative for the four years. Prudence's leadership and organizational skills have been instrumental in fostering a vibrant community among her peers. During her long holidays, she has gained valuable practical experience through internships at respected architecture firms, where she has contributed to various stages of the design and construction process. These internships have allowed her to apply her academic knowledge to real-world projects and gain a deeper understanding of the profession. Alongside her architecture coursework, Prudence is currently training to obtain her private pilot's license. During her free time, she can be found at Wilson airport, logging flight hours and improving her piloting skills. This unique combination of architectural and aviation knowledge has inspired her to consider the ways in which the two disciplines can be integrated, such as in the design of airport terminals and air traffic control facilities. As Prudence looks ahead to her final tier of study, she is eager to tackle more complex design challenges and continue improving her skills. With a strong foundation in both the technical and conceptual aspects of architecture, she is well-positioned to make a meaningful contribution to the field.

MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA

SITE INFORMATION

SITE/PROJECT: COMMERCIAL AND OFFICE BUILDING, WESTLANDS

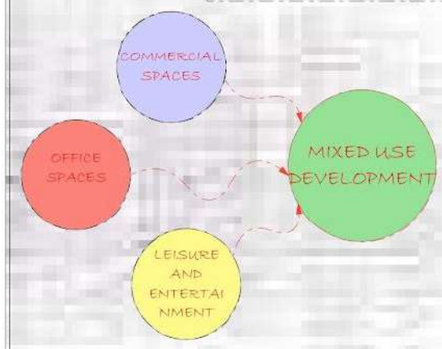
SITE JUSTIFICATION

- THE SITE IS IN A PROMINENT LOCATION EASILY ACCESSIBLE BY THE PUBLIC MAKING IT IDEAL FOR A MIXED-USE COMMERCIAL TOWER INCORPORATING DIFFERENT USES -OFFICES, COMMERCIAL COMPLEX.
- THE PRIMARY MARKET CATCHMENT FOR THE PROPOSED DEVELOPMENT IS THE WESTLANDS BUSINESS DISTRICT WHICH CONSISTS OF MANY OFFICE BUILDINGS THAT CAN BE SERVICED BY A COMMERCIAL HUB REDUCING THE DISTANCES SOME OF THE WORKERS COVER TO GET FOOD AND UTILITIES AND GENERALLY IMPROVING THEIR PERFORMANCE AT WORK. THE SECONDARY CATCHMENT IS ENCOMPASSED IN THE GREATER NAIROBI METROPOLITAN AREA AND ITS ENVIRONS.
- IT IS SITUATED ADJACENT TO MAJOR TRANSPORT HUBS OF THE CITY SUCH AS UHURU HIGHWAY & THE EXPRESSWAY.
- IT BEARS PROXIMITY TO SOME OF NAIROBI'S ICONIC BUILDINGS E.G. THE GLOBAL TRADE CENTRE ETC. WHICH DRAW MASSES TO THE REGION.

Source : Google earth

Source : Nick Marete , 2024.

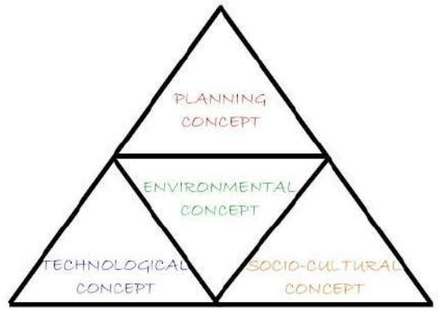
CONCEPTUALISATION



DESIGN PHILOSOPHIES

1. FORM AND FUNCTION ARE ONE - "FRANK LLOYD WRIGHT"

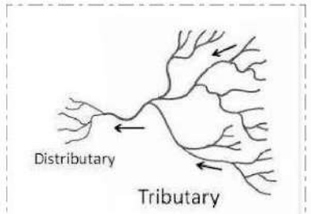
2. SIMPLICITY IS NOT THE ABSENCE OF CLUTTER, THAT'S A CONSEQUENCEOF SIMPLICITY - "JONATHAN IVE"

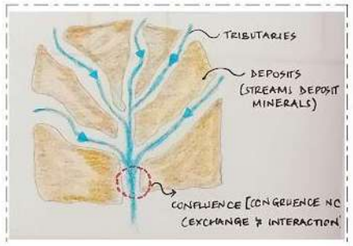


PLANNING CONCEPTS

ANALOGIES:

RIVER TRIBUTARIES



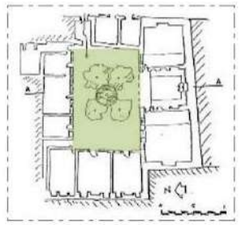


SOCIO-CULTURAL CONCEPTS

THE SITE IS LOCATED IN WESTLANDS WHICH IS AN AREA OCCUPIED BY MOSTLY ASIAN RACESOME OF THEIR CUTURAL CONCEPTS WHICH MATCH WITH THOSE OF THE LOCAL INHABITANTS THAT CAN BE INCORPORATED INCLUDE:

ANALOGIES:

1. COURTYARD DESIGN
-COMMUNAL SPACES
-NATURAL VENTILATION



2. IMPORTANCE OF PUBLIC SPACES

3. VERANDAS OR PORCHES AT THE FRONTS OF BUILDINGS

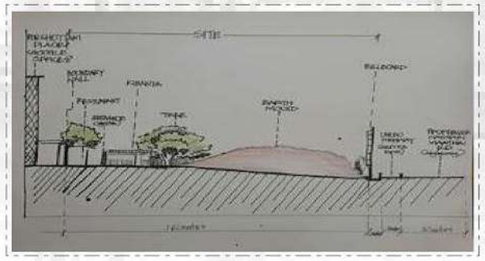
Source : Theng Shai presentation , n.d

ENVIRONMENTAL CONCEPTS

ANALOGIES:

THE SITE TOPOGRAPHY

THE SITE IS ONE WITH A GENTLE SLOPE AND THEREFORE THE BUILDING COULD EASILY FOLLOW THE TERRAIN IN THE WESTLANDS
AREA



PRUDENCE NEEMA
B11/0591/2020
SEMESTER 2
CONCEPT

MIXED USE DEVELOPMENT, WESTLANDS, NAIROBI

VEGETATION COVER

1. OLIVE TREE - YMBOLIZES PEACE, PROSPERITY, AND WISDOM, ADDING A TOUCH OF TIMELESS ELEGANCE

2. JACARANDA TREE - FOR ITS VIBRANT LAVENDER FLOWERS

3. PALM TREE - FOR ITS TROPICAL AMBIENCE, LOW- MAINTENANCE & ARCHITECTURAL FOCUS

4. AFRICAN FLAME - OR ITS STUNNING DISPLAY OF RED FLOWERS ALL YEAR

SCALE 1:500

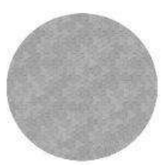
KEY

1. VEHICULAR SITE ACCESS
2. DROP OFF AREA & ENTRY
3. 60 CAR PARKING .
4. ENTRANCE.
5. ATRIUM
6. FOOD COURT ENTRANCE
7. OUTDOOR SEATING AREA.
8. OUTDOOR EXHIBITION AREA
9. KID'S PLAYGROUND
10. LOADING BAY
11. SERVICE ENTRANCE
12. MEDITATION GARDEN
13. WATER FEATURE
14. AREA FOR EXPANSION
15. SERVICE TRACK

MAP KEY

- TREE
- BOXWOOD SHRUB
- SOLAR PANELS
- PARASOLS
- ENTRANCES

SITE SURFACE TREATMENT



CABBRO PAVING : FOR DURABILITY & PERMIABILITY

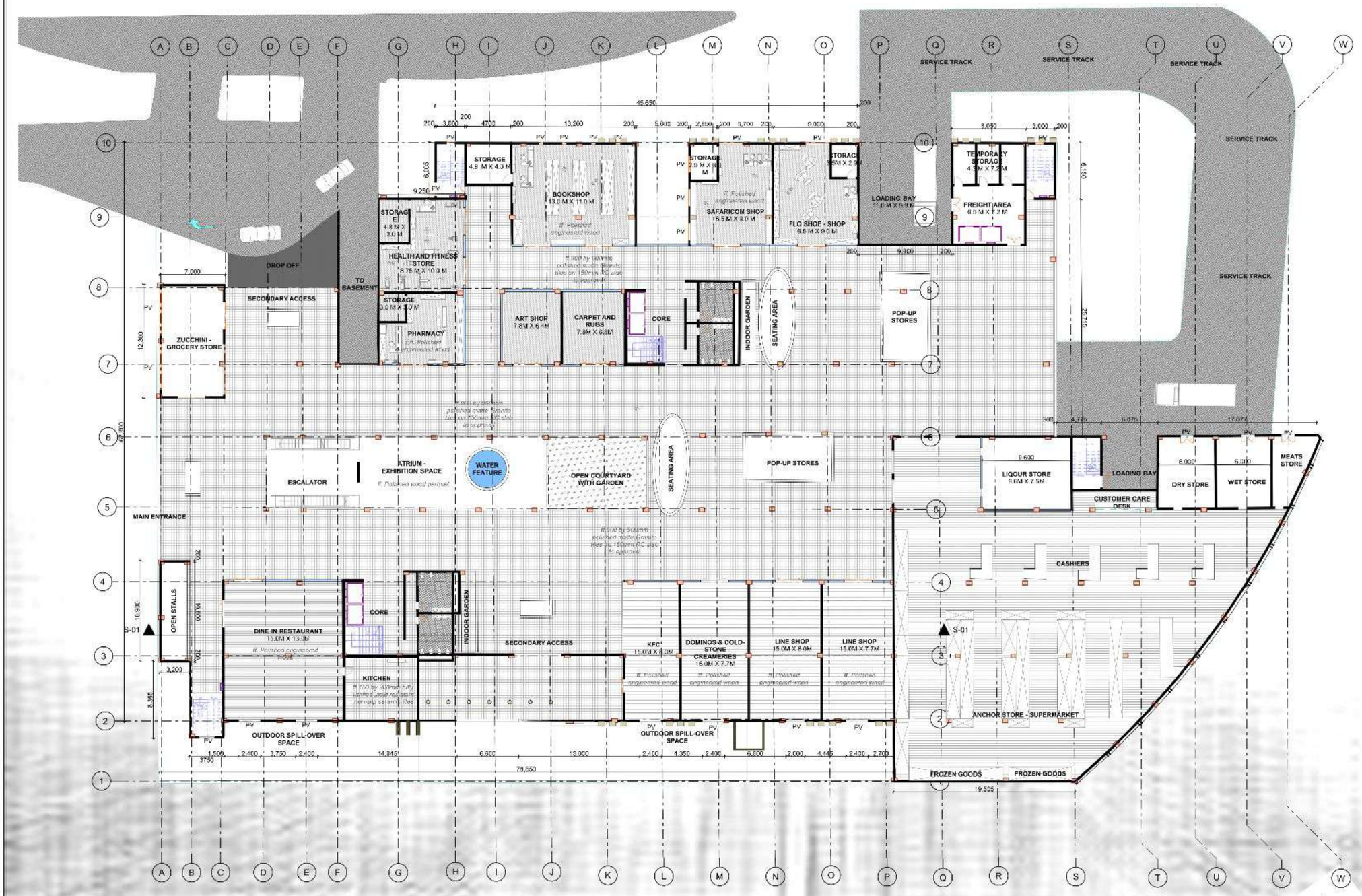
ASPHALT : ENSURES SEAMLESS INTEGRATION FOR VEHICLES

GRASS : FOR AESTHETICS, AMBIENCE & REDUCE HEAT ISLAND EFFECT

WATER FEATURE : TO INCREASE FOOT TRAFFIC AND ADD FOR NOISE MASKING

PRUDENCE NEEMA
B11/0591/2020
SEMESTER 2
SCALE 1:500

MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA



GROUND FLOOR PLAN

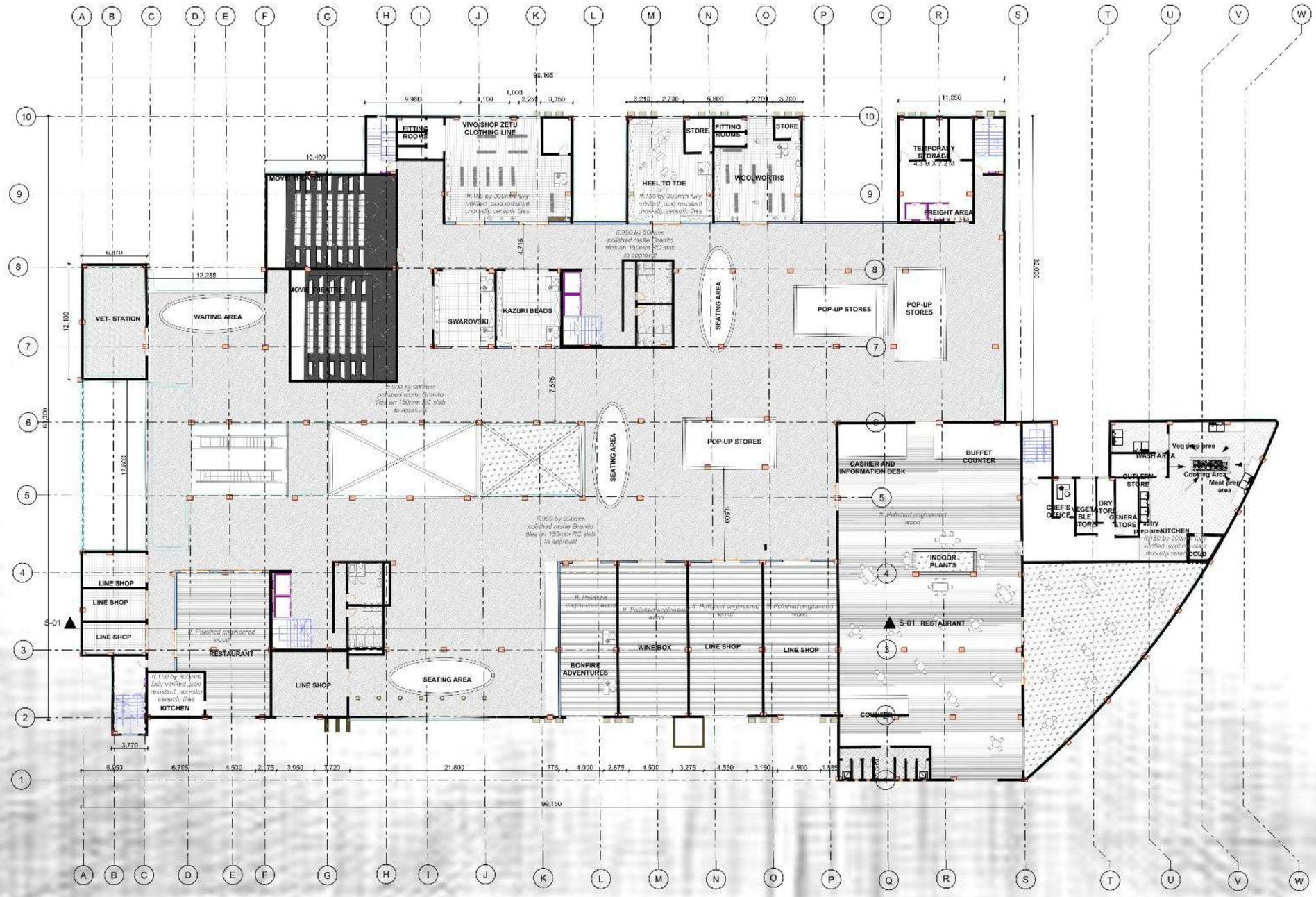
ABOUT THE LAYOUT

-THE GROUND FLOOR IN ANY BUILDING IS THE MOST ACCESSED FLOOR AND THEREFORE THE LEAST PRIVATE.
-LETTABLE SPACES ON THE GROUND FLOOR COST MORE THAN ON ANY OTHER FLOOR.
-BEING THE FLOOR WITH THE MOST TRAFFIC, IT HOSTS PART OF THE COMMERCIAL SERVICES AND THE ANCHOR TENANT IS ON THIS FLOOR.

SPATIAL ANALYSIS

1. SUPERMARKET
2. RESTAURANTS
3. PHARMACY
4. HEALTH AND FITNESS STORE
5. ART SHOP
6. SAFARICOM SHOP
7. SHOE SHOP
8. LOADING BAY AND STORES
9. POP UP STALLS
10. SEATING AREA
11. WATER FEATURE

MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA



FIRST FLOOR PLAN

ABOUT THE LAYOUT

-THE FIRST FLOOR IS ALSO FOR THE COMMERCIAL FACILITIES.
- THE COST OF LETTING SPACES HERE IS SLIGHTLY CHEAPER COMPARED TO THAT OF GROUND FLOOR.
- THE FACILITIES HERE ARE ALMOST SIMILAR TO THOSE ON GROUND FLOOR.

SPATIAL ANALYSIS

1. DINE IN RESTAURANT WITH A HOT KITCHEN
2. FAST FOOD RESTAURANTS
3. VET CLINIC
4. MOVIE THEATRE
5. JEWELLERY STORE
6. TRAVEL AGENCY
7. SHOE SHOP
8. LOADING BAY AND STORES
9. CLOTHING STORE
10. SEATING AREA
11. STORAGE AREA
12. OTHER LINE SHOPS
13. ATRIUM

MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA

ABOUT THE LAYOUT

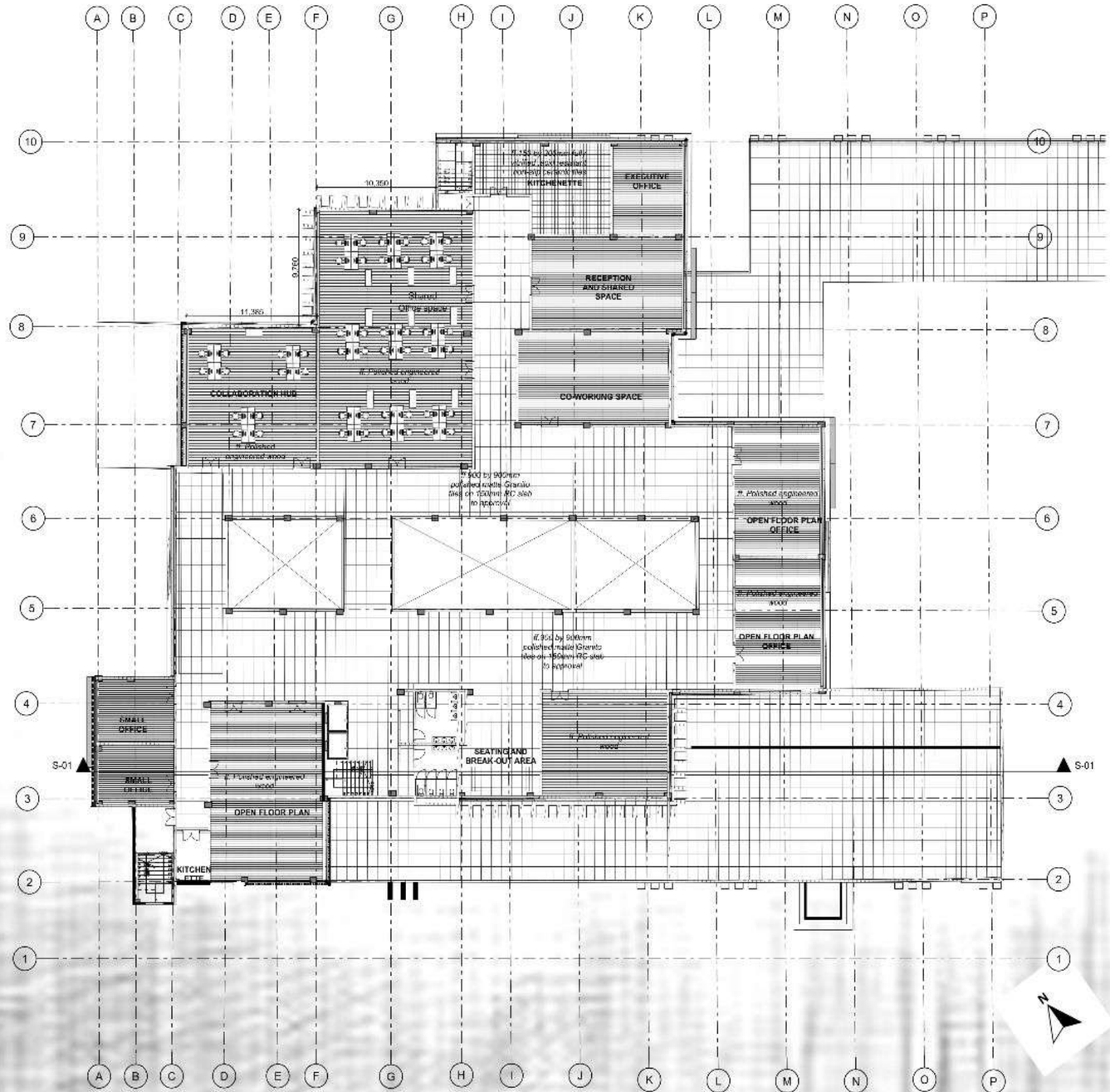
-THE SECOND FLOOR IS ALSO FOR THE COMMERCIAL FACILITIES.
- THE COST OF LETTING SPACES HERE IS SLIGHTLY CHEAPER COMPARED TO THAT OF GROUND AND FIRST FLOOR.
- THE FACILITIES HERE ARE THOSE THAT REQUIRE VERY LITTLE ADVERTEISEMENT.

SPATIAL ANALYSIS

1. BOWLING ALLEY WITH INDOOR GAMES
2. FAST FOOD RESTAURANTS
3. OUTDOOR GAME AREA
4. MOVIE THEATRE (DOUBLE VOLUME FROM FIRST FLOOR)
5. FURNITURE STORE
6. LAUNDRY SERVICES
7. GYM
8. ATM LOBBY
9. DENTAL SERVICES
10. EXHIBITION AREA FOR ANY POP UP EXPOS OR EVENTS
11. SALON AND BARBER
12. SEATING AREA

SECOND FLOOR PLAN

MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA



THIRD TO SEVENTH FLOOR PLAN

SCALE 1:200

3D RENDERS AND INTERIOR VIEWS

EXTERIOR SHOTS

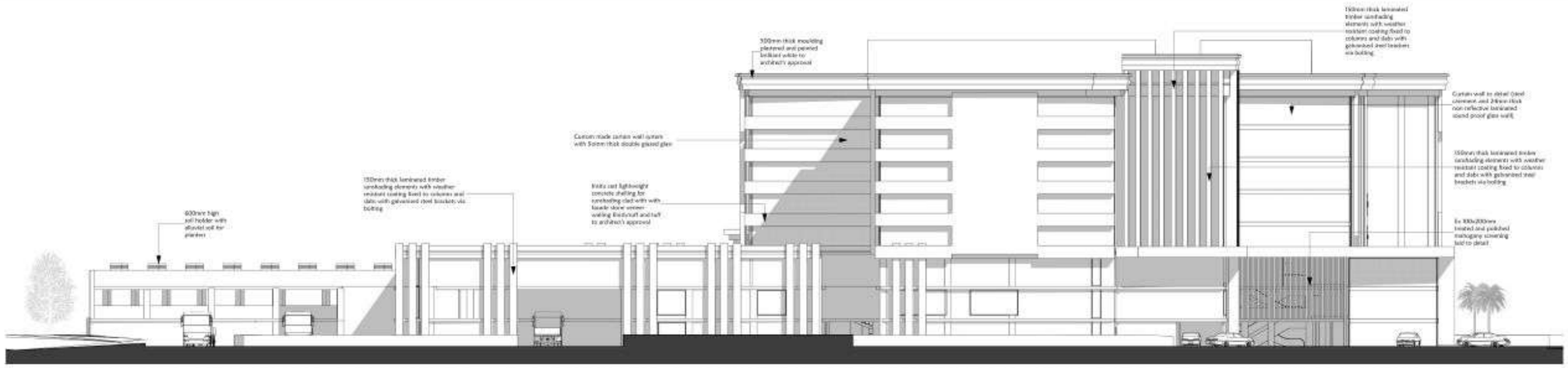
INTERIOR SHOTS

MAIN ENTRANCE

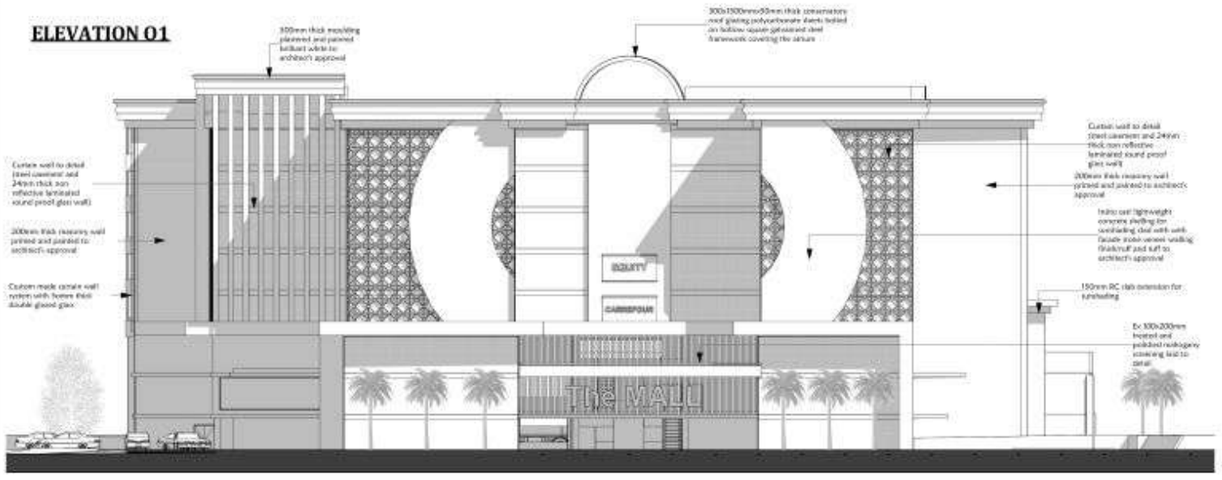
PRUDENCE NEEMA	
B11/0591/2020	
SEMESTER 2	
SCALE VARIED	

MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA

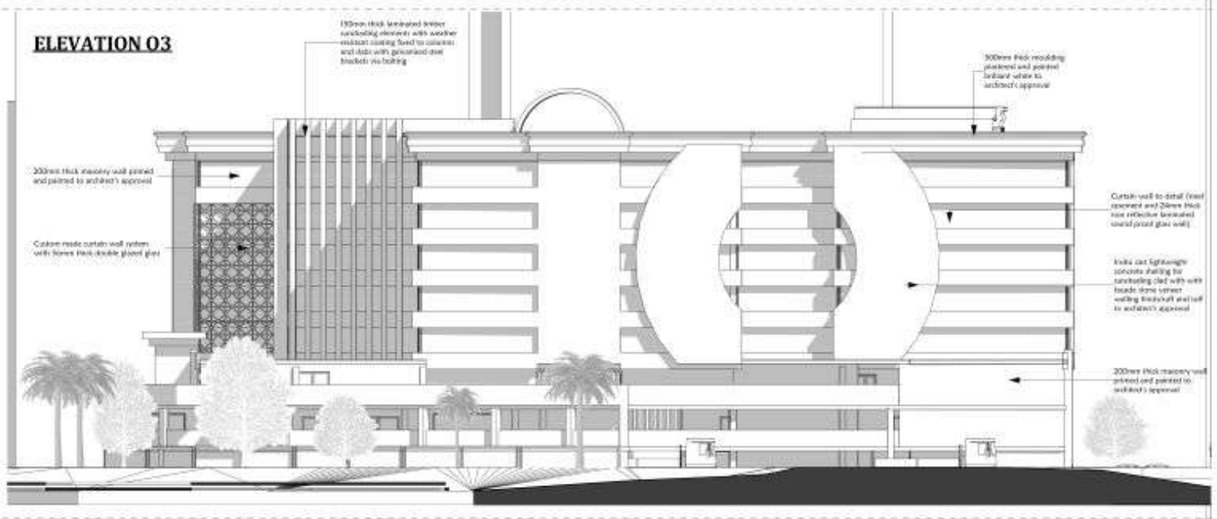
ELEVATION 02



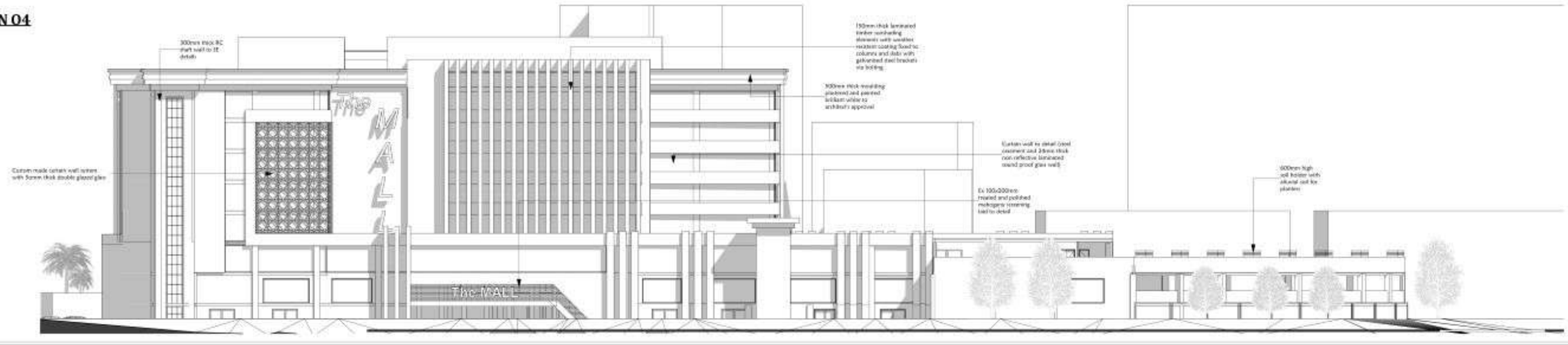
ELEVATION 01



ELEVATION 03



ELEVATION 04



MIXED USE DEVELOPMENT, WESTLANDS , NAIROBI AREA

PRESENTATION DRAWINGS

Ground floor with commercial spaces, highly priced because the traffic flow is highest here.

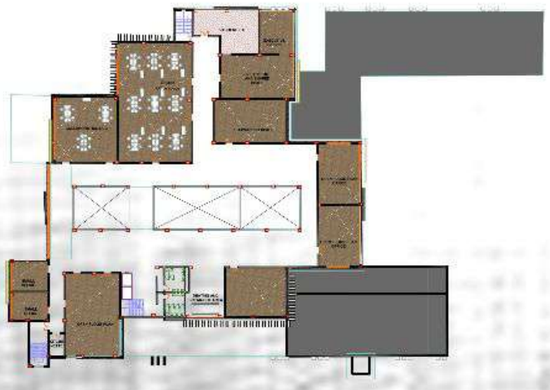
GROUND FLOOR PLAN
SCALE 1:500

First floor with more commercial spaces, highly priced though cheaper than the ground floor because the traffic flow is also high here.

FIRST FLOOR PLAN
SCALE 1:500

Second floor with communal spaces such as a kids play area, exhibition space and indoor bowling alley. This is the last commercial space in the building.

SECOND FLOOR PLAN
SCALE 1:500



Third to seventh floor spaces that host the office spaces. This is a card access area and is limited only to those working on those floors.

THIRD TO SEVENTH FLOOR PLAN
SCALE 1:500

MOCK RENDERS

PRUDENCE NEEMA

B11/0591/2020

SEMESTER 2

SCALE 1:500

NAME: Simon Mwendwa Mutunga, BAS IV

INSTITUTION: Department of Architecture & Interior Design (DAID), Faculty of Engineering and Architecture (SEA), Kenyatta University (KU).

EMAIL: mwendwasimon200@gmail.com

BIOGRAPHY:

Simon Mwendwa is a fourth-year student of architecture in the Department of Architecture and Interior Design of the Kenyatta University. He adheres to a design philosophy that is centered on simplicity, transformation, and social impact. Guided by these convictions, Simon strives to create spaces that enhance well-being and instill a sense of pride in the users. He has gained valuable experience working with different architecture firms on diverse projects, including sports centers, getaway resorts, and residential developments. These have all deepened his understanding of how thoughtful design can elevate communities. Simon is also passionate about urban design and was a finalist in a competitive street design contest in Nairobi. He volunteers as an architectural consultant, helping those who cannot afford professional services in rural communities, to build better homes using traditional vernacular methods. Simon continues to explore innovative approaches that enhance both the built environment and the broader community, seeking to make architecture accessible and meaningful to all.

PINNACLE TOWERS

Project Goals

1. Community Engagement:

The goal is to create a dynamic community hub that encourages social interaction, supports various work activities, and provides ample opportunities for leisure and recreation, thereby enhancing the quality of life for its users.

2. Economic Synergy:

The project seeks to foster synergy among different businesses within Kenya's economy, from small-scale enterprises to large corporations, by creating an integrated space that supports economic growth and collaboration.

3. Sustainable Building Practices:

The project aims to incorporate eco-friendly building materials, energy-efficient systems, and water conservation technologies to align with the values of environmental sustainability and responsible construction.

4. Innovative Landmark:

The development is designed to stand out as an innovative landmark that significantly contributes to the visual identity and architectural character of the Westlands district, setting a new standard for modern urban design.

Project Description

The Westlands Proposed Office Building is a visionary architectural project set to rise in the vibrant district of Westlands, Nairobi. Envisioned as a multifunctional facility, this innovative building will redefine traditional office spaces by offering a dynamic blend of work, leisure, wellness, living, shopping, and hospitality experiences.

As a landmark project, the Westlands Proposed Office Building will transform the skyline and set new standards for sustainable urban development. This iconic structure will feature modern office spaces, leisure areas, wellness facilities, Modern apartments, a shopping mall, and a luxury hotel, fostering productivity, relaxation, well-being, and premium hospitality. Emphasizing sustainability, community engagement, and economic vitality, the project combines cutting-edge architecture and thoughtful design to become a beacon of progress and innovation in Nairobi.

Project details

Location: Westlands Nairobi, Kenya

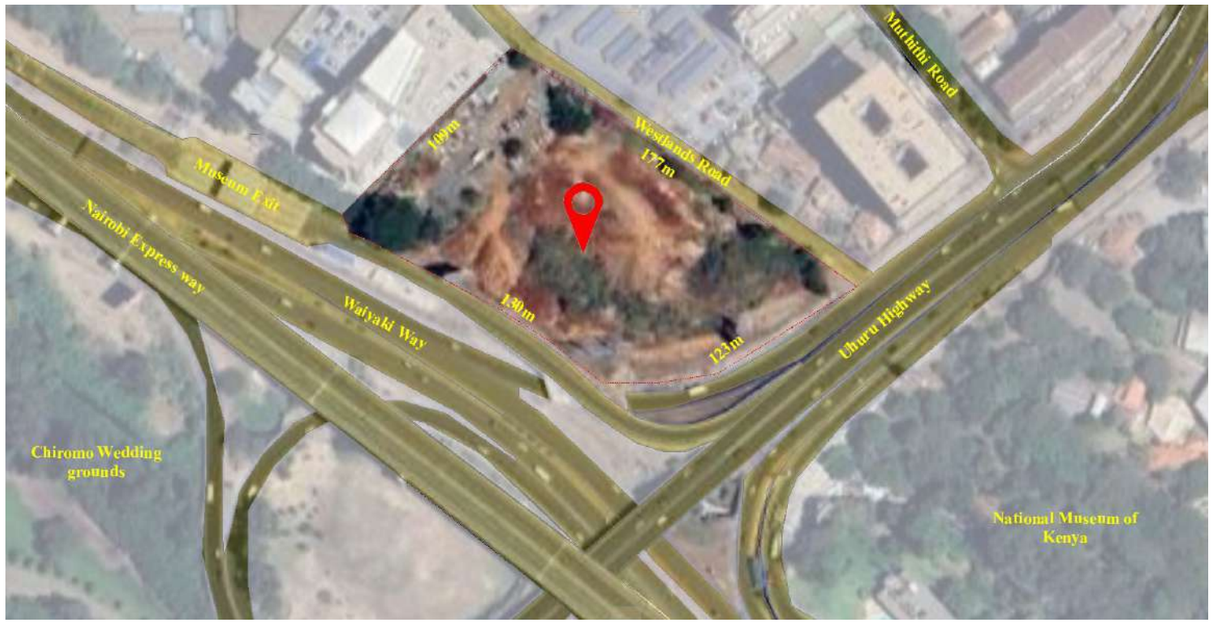
Area:

Floors: 25

Typology: Commercial mixed use building

Uses: Shopping
Offices
Hospitality
Recreation
Residential

Structure: Core structure(Cantilevered plate Structure)



Map of Site and surrounding roads, Nairobi Expressway, Waiyaki way and Uhuru Highway (*Google Maps*, n.d.)

PINNACLE TOWERS

Project and Site Justification

1. Market Demand and Demographics

Westlands, a major business hub with organizations like USAID, Google, and the Sweden and Republic of Korea Embassies, has a strong demand for premium office spaces. This demand is driven by the high concentration of professionals and businesses in the area.

The site's location next to the Parklands residential area and the University of Nairobi provides access to a diverse market. This includes needs for shopping, entertainment, fitness, and accommodation, making it an ideal spot to serve both residents and professionals.

Residential neighborhood and top organisations in Westlands
(*Google Maps*, n.d.)

1. EMBASSY OF THE REPULBIC OF KOREA
2. STANBIC BANK HEADQUATERS
3. GOOGLE HEADQUATERS KENYA
4. UNIVERSITY OF NAIROBI

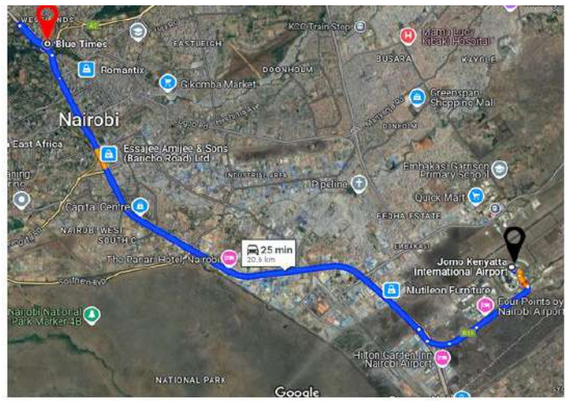
UPPER PARKLANDS(RESIDENTIAL AREA)

2. Accessibility and Proximity to Nairobi CBD:

The site's strategic location, just 10 minutes from Nairobi CBD, 25 minutes from Jomo Kenyatta International Airport, and a 5-minute walk from nearby residential areas, ensures excellent accessibility. This prime position allows convenient commuting for businesses, clients, and residents from prominent points in the city.

Muindi, & Muindi. (2021, December 27). Nairobi Global Trade Centre latest tourist attraction commissioned. Khusoko - East African Markets.

10 min drive from Nairobi CBD
(*Google Maps*, n.d.)



25 min drive from Jomo Kenyatta International Airport
(*Google Maps*, n.d.)

3. Future Growth Potential:

Westlands, known as a hub for innovative developments, signals strong growth potential for Grade A office buildings. This aligns with the rising trend of forward-thinking projects like GTC Tower and One Africa Place in the area.

Gallery - ONE AFRICA PLACE. (2015, September 10). ONE AFRICA PLACE. https://www.oneafricaplace.com/gallery/

Site Visibility and Image:

Positioned at a prime intersection, the site offers unparalleled visibility, presenting a remarkable opportunity to create a distinctive landmark.

The strategic location ensures that the development will be prominently visible from various vantage points, providing captivating and expansive views of the city. This not only adds to the aesthetic appeal of the building but also significantly enhances the overall image of the development.

By capitalizing on the site's visibility and picturesque surroundings, the landmark will become an iconic addition to the urban landscape, contributing to the identity and allure of the area.

Map of Site and surrounding roads, Nairobi Expressway, Waiyaki way and Uhuru Highway
(*Google Maps*, n.d.)

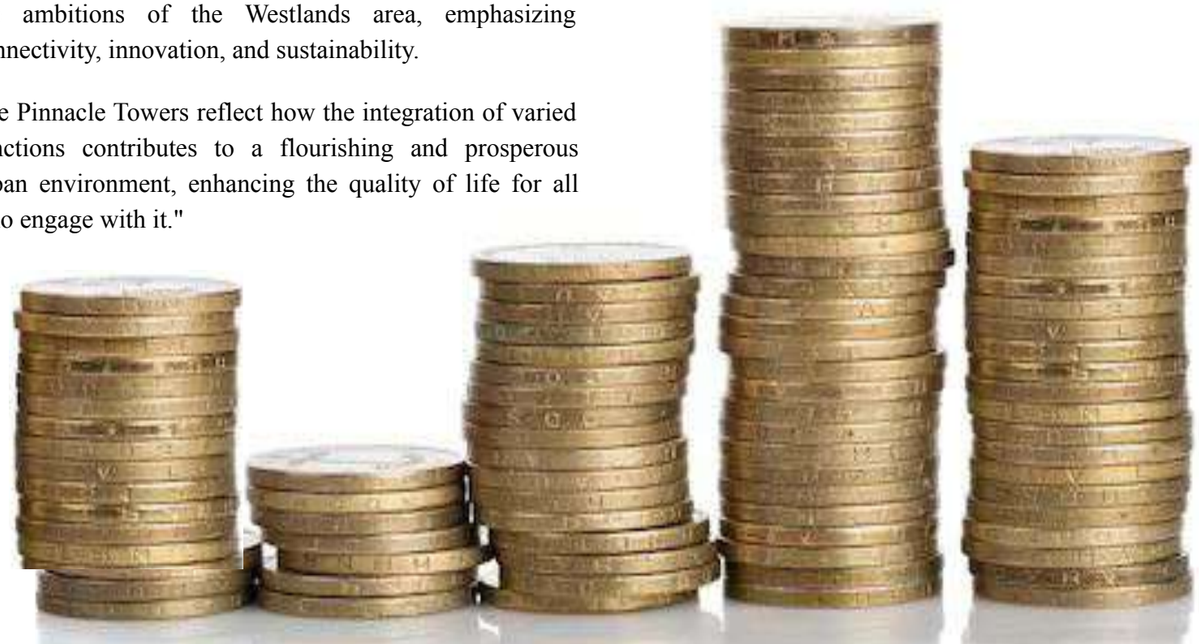
PINNACLE TOWERS

Design Concept

" Much like the careful arrangement of coins that builds a stable and impressive stack symbolizing accumulation, growth and the economic prosperity, the Pinnacle Towers embody this metaphor through their design.in the new approach to urban living, merging residential, commercial, and recreational spaces into a unified self sustaining vertical community.

This metaphor captures the development's alignment with the ambitions of the Westlands area, emphasizing connectivity, innovation, and sustainability.

The Pinnacle Towers reflect how the integration of varied functions contributes to a flourishing and prosperous urban environment, enhancing the quality of life for all who engage with it."

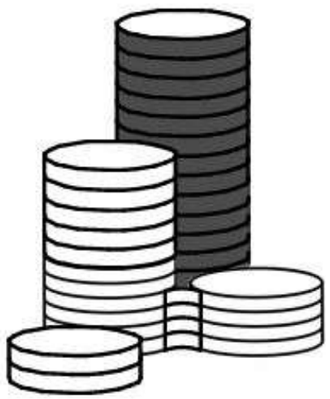


Residential neighborhood and top organisations in Westlands
(*Google Maps*, n.d.)

Form Development

Stacked coins form the base form of the development

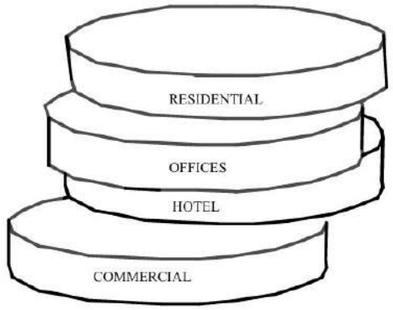
Connecting the bottom levels to form a continuous podium and tower structure, with different heights to create a dynamic visual contrast,



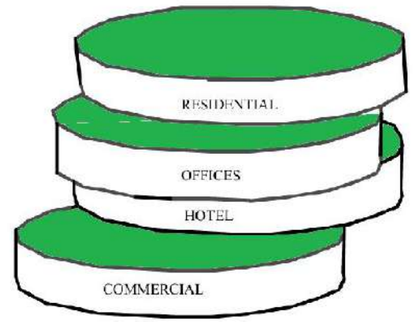
Multiple stacks of varying heights creates a dynamic interplay of elevations, enhancing the visual interest and complexity of the design.

Staggering the coins at different heights creates a dynamic visual effect, adding depth and interest to the design.

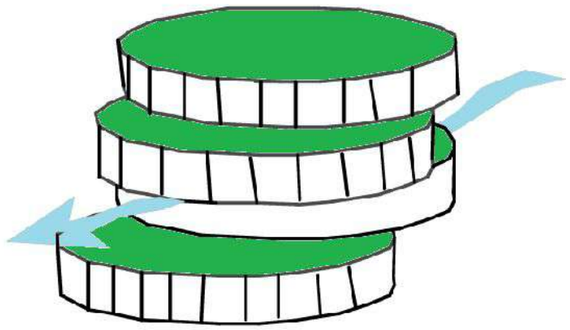
Form Analysis



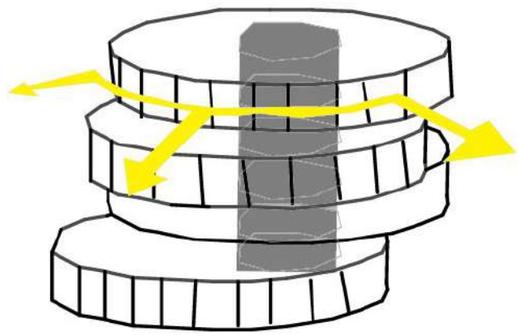
Program Identity: The staggered design allows for clear separation of spaces and activities within the building as you ascend.



Outdoor Spaces: Staggered levels creates terraces, offering outdoor areas for social interaction, relaxation, and amenities, enhancing tenants' quality of life.



Sunlight and Ventilation: The staggered arrangement enhances natural ventilation and daylight throughout the building. By carefully positioning terraces and openings, solar exposure and airflow is optimized



Central Core: By positioning vertical circulation and utilities in the central core, the design maximizes available floor space. This arrangement frees up more usable area on each floor plan.

PINNACLE TOWERS

Building Form

Tower 1 (17 Floors)
The tallest structure, this tower combines upper-level residential units with lower floors dedicated to offices and co-working spaces, blending work and living environments.

Tower 2 (7 Floors)
Focused on workspaces, this tower provides offices and co-working areas, offering flexible professional settings across its 7 floors.

Main Podium (5 Floors)
This podium hosts a bustling mall and a luxury hotel, creating a vibrant commercial and leisure hub within the development.

Wellness Podium (4 floors)
A smaller section of the podium dedicated to health and wellness, featuring a commercial gym and spa for relaxation and fitness.

PROGRAM LAYOUT

1. Residential

The top level features modern and luxurious 1, 2, and 3-bedroom apartments, designed to suit the refined tastes and upscale lifestyle of Westlands residents.

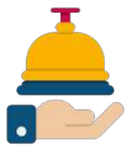
2. Offices

Modern office spaces designed to offer high-quality environments for Westlands' business community. With open-plan layouts, they provide flexibility to accommodate various arrangements and sizes of companies.

3. Co-working space

Dynamic co-working spaces are increasingly popular among the business community. They offer flexible, collaborative environments that support diverse working styles and foster networking opportunities.

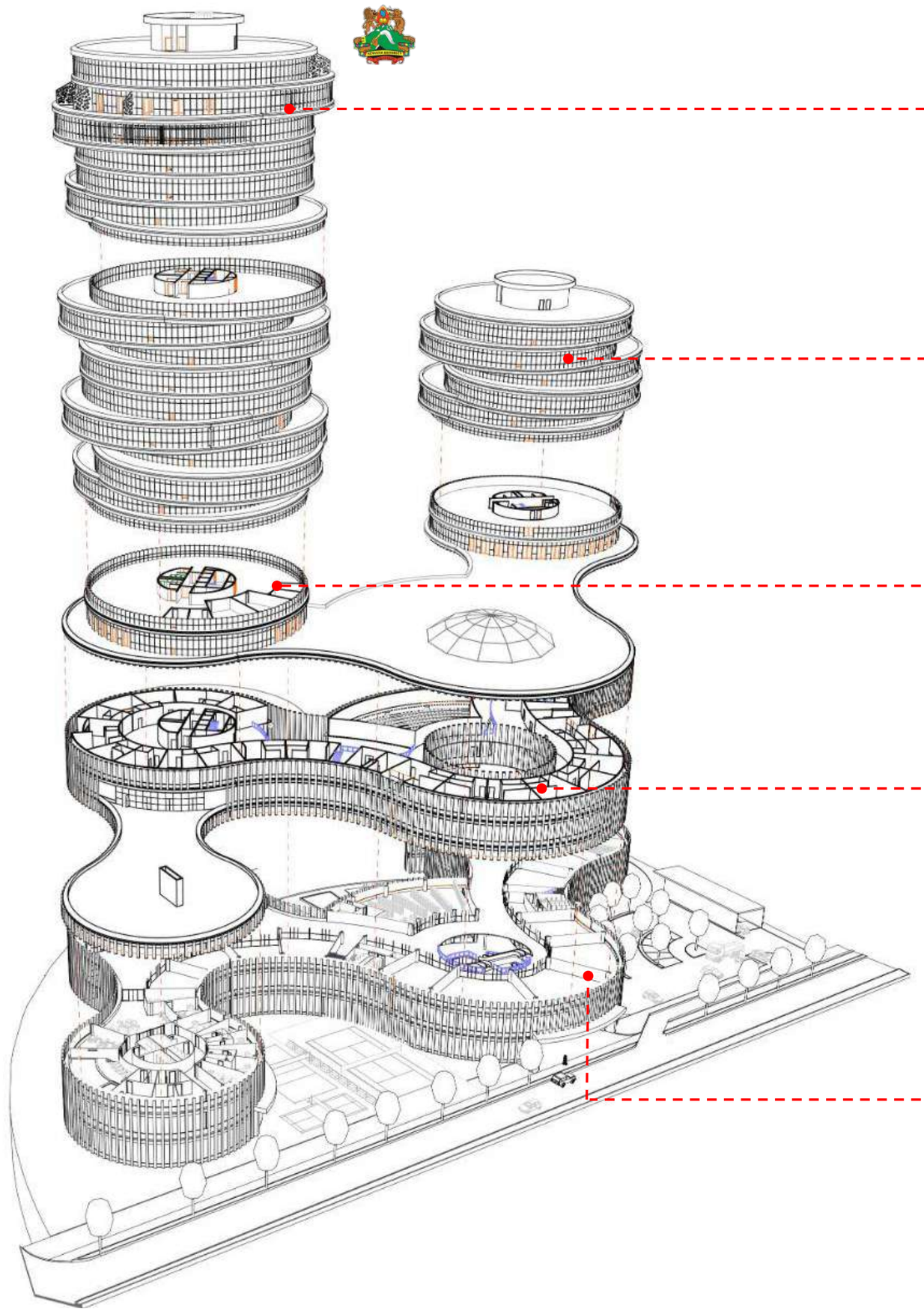
4. Hotel and Conference



The luxury hotel featuring modern conference facilities and an exquisite spa. Westlands is a renowned destination for high-end hotels and spas, akin to the esteemed Kempinski.

4. Shopping Mall

A Shopping mall featuring diverse shopping options along with entertainment areas for kids and adults, serving the Westlands community and the greater Parklands area.



1. APARTMENTS:
1 Bedroom apartments
2 Bedroom apartments
3 Bedroom apartments
Common Laundry

2. OFFICE SPACES
Flexible open office spaces
Outdoor terrace
Wasrooms
Roof top deck

3. CO- WORKING SPACES
Board rooms
Discussion rooms
Work desks
Outdoor terrace
Bar
Kitchenette

4. HOTEL AND CONFERENCE
Boardrooms
Conference halls
Accommodation
Restaurant
Bar
Spa

4. SHOPPING MALL
Retail Shop
Restaurant
Cinema
Gaming Lounge
Commercial Gym
Picnic Ground

THE MALL

Positioned on the lowest levels, spanning the ground, first, and second floors, the mall is designed to serve as the foundation of activity within the development. This strategic placement is not merely functional but symbolic, representing the base from which the vibrancy of the entire project emerges.

The mall includes:

1. Retail Shops:

The retail shops are strategically placed to create a vibrant shopping experience, inviting and sustaining foot traffic throughout the mall. They offer a diverse range oF sizes meeting the different needs of retailers

Image of the mall corridor

2. Restaurant with Outdoor Patio

This dining space, complete with an outdoor patio, offers a blend of culinary delights and al fresco experiences, encouraging social interaction and leisure within a relaxed setting.

3. Movie Theatre

The movie theatre provides an entertainment hub within the mall, drawing in crowds and offering a cultural touchpoint that enhances the social fabric of the development.

Mall Movie Theatre

Ground floor legend

1. Main Entrance
2. Landscaped central atrium
3. Retail shop
4. Secondary entrance
5. Restaurant
6. Movies reception and lounge
7. Cinema hall
8. Restaurant deck
9. Play ground
10. Picnic grounds
11. Water fountain
12. Gym reception
13. Lounge
14. Gym health unit
15. Cardio room
16. Weights room
17. Staff break room
18. Locker rooms
19. Washrooms
20. Lift and stairwell
21. Handball court
22. Tennis court
23. Parking lot
24. Vehicular entrance
25. Street retail / vending shops

THE MALL

4. Landscaped Courtyard

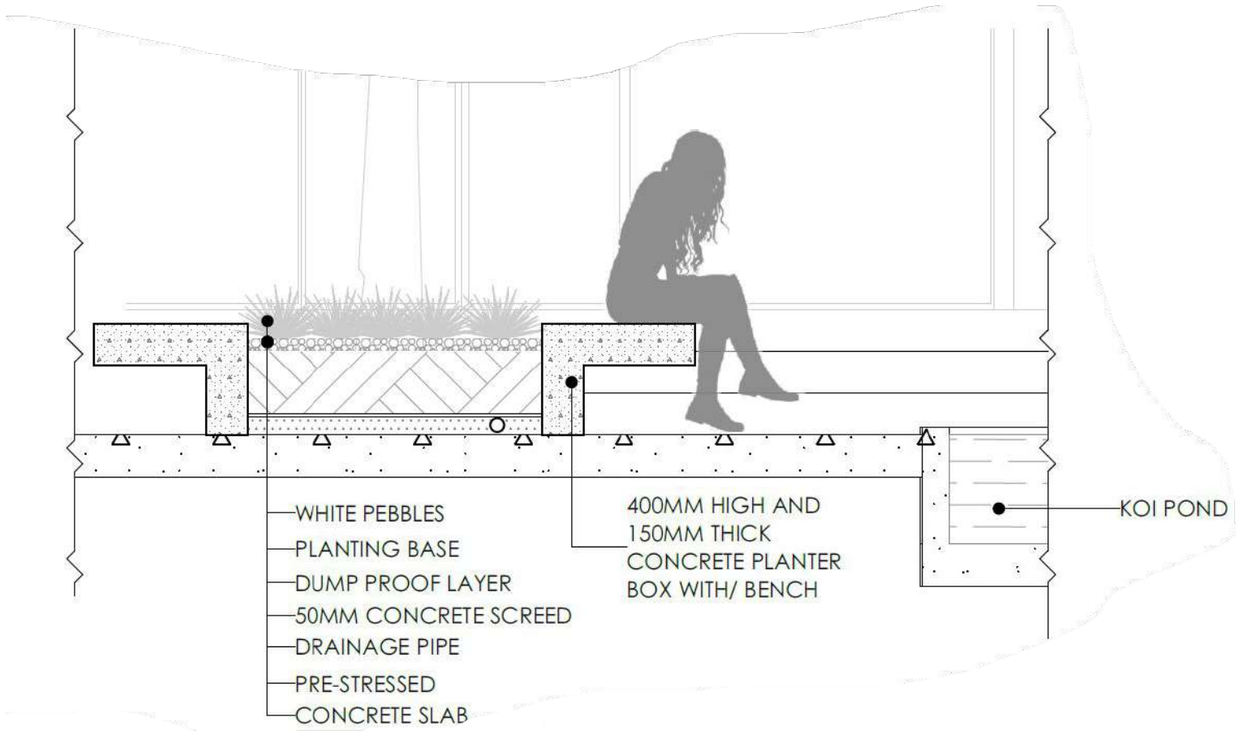
A serene landscaped courtyard, featuring a koi pond, surrounded by retail shops. This space serves as a tranquil oasis, offering a peaceful retreat within the bustling commercial environment.

Ground floor landscaped Courtyard

5. Commercial Gym and Sporting Facilities:

The gym, along with its health unit and sporting facilities like a handball and lawn tennis court, promotes wellness and active living. Serving both residents and non-residents, it caters to fitness enthusiasts and anyone seeking a healthy lifestyle.

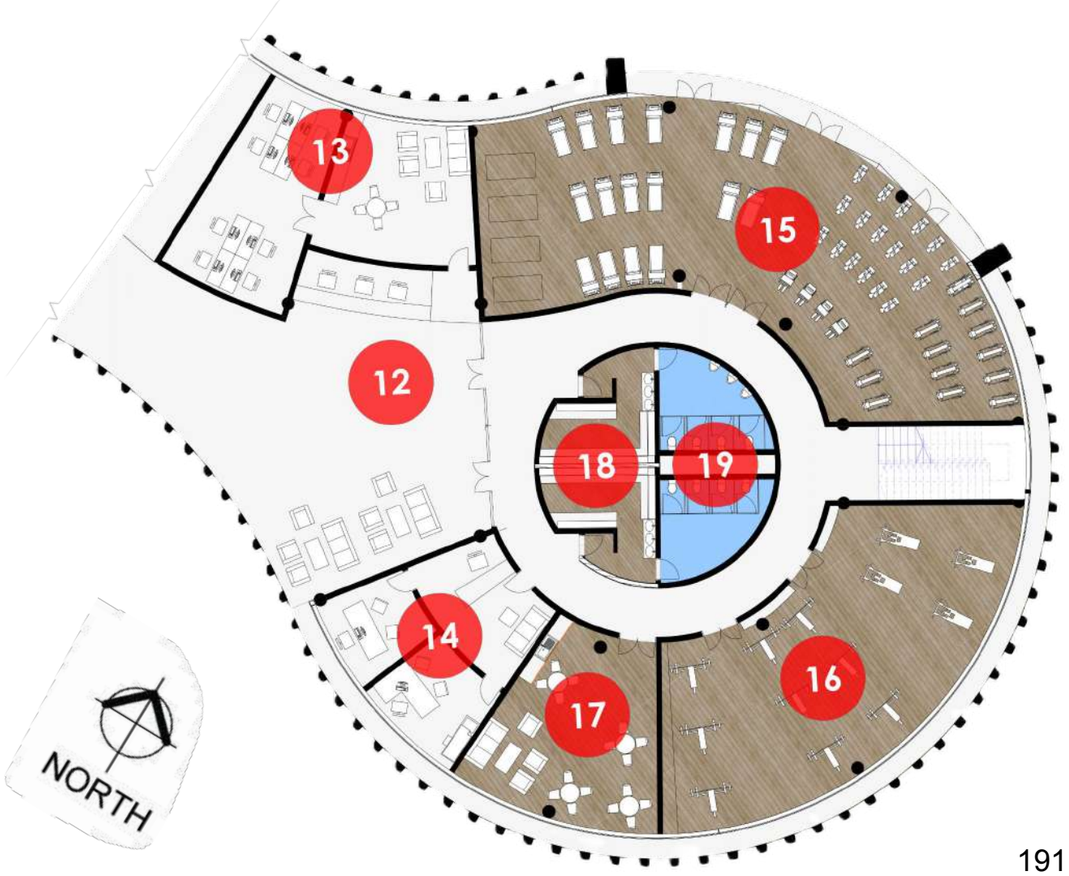
Commercial gym



Planter box/ Bench at Atrium

Gym floor Plan

1. Gym reception
2. Lounge
3. Gym health unit
4. Cardio room
5. Weights room
6. Staff break room
7. Locker rooms
8. Washrooms



THE MALL

6. Banking Services

The bank provides essential financial services and convenience, catering to both the residential a commercial activities within the building. Its integration into the mall enhances the over functionality and accessibility of the development.

Banking hall

8. Group Fitness Studios:

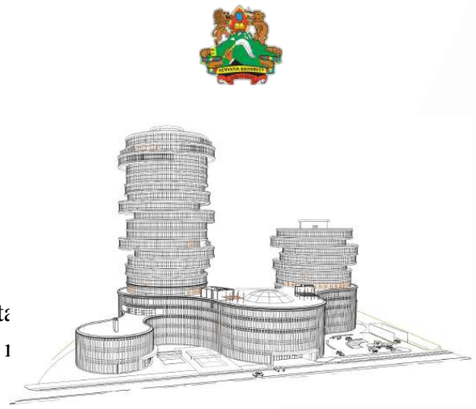
The group fitness studios, featuring spaces for yoga, dance, and other group exercises, support a diverse range of fitness activities, encouraging both physical wellness and community engagement.

Yoga studio

First floor legend

1. Retail Shop
2. Banking hall
3. Bank offices
4. Supermarket
5. Storage
6. Group fitness
7. Gym coffee shop
8. Gym washroom
9. Locker room
10. Management offices
11. Lift and stairwell
12. Washroom

THE MALL



9. Gaming Lounge:

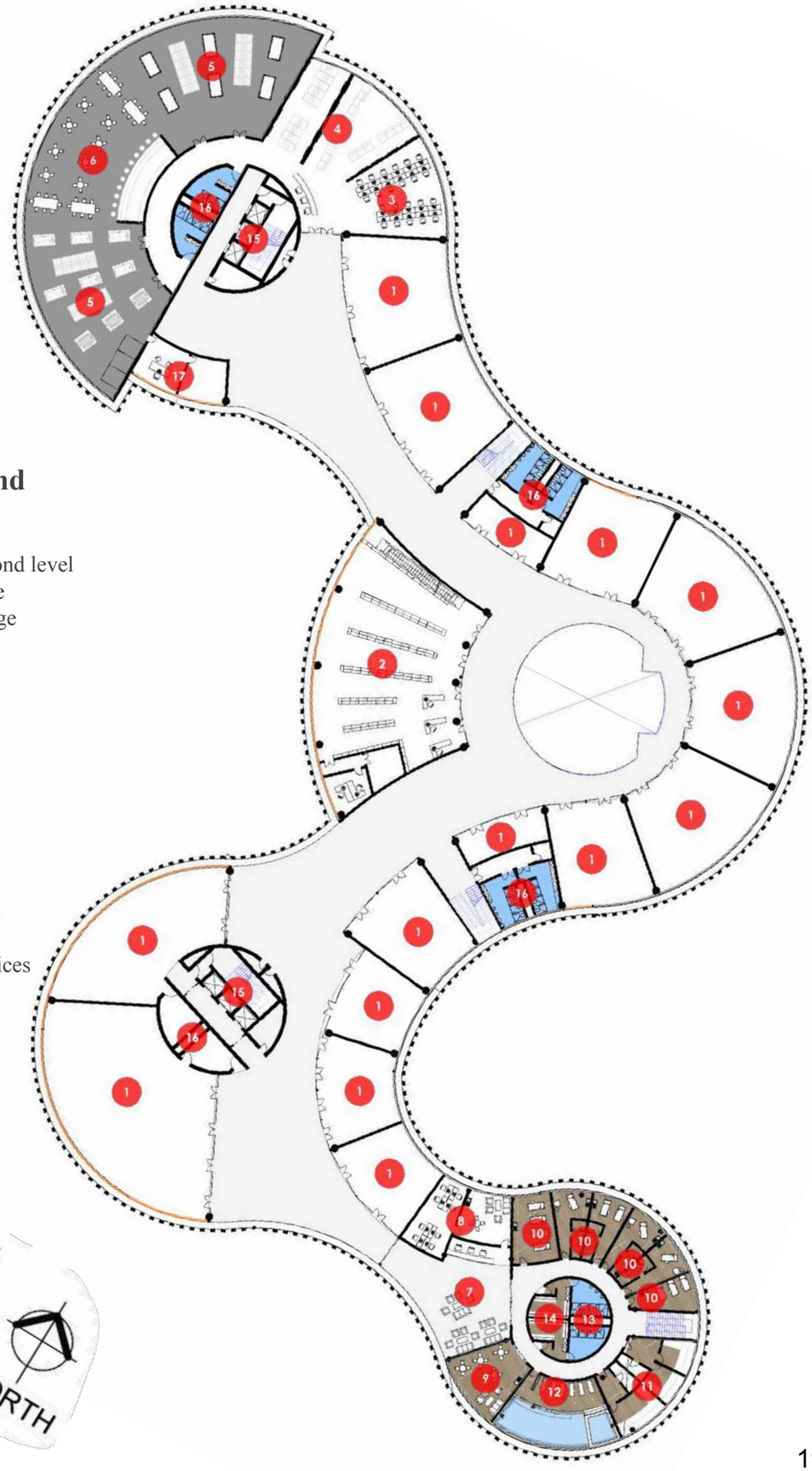
The gaming lounge offers a range of entertainment options, including PC gaming, PlaySta games, and a bar. This space serves as a social hub, attracting a diverse audience for leisure and r

Gaming Lounge

10. Spa

The spa offers a luxurious retreat within the mall, featuring massage rooms, a sauna, and an indoor heated pool. It caters to Visitors, users from the gym and group exercise studios, as well as hotel guests, office tenants and residential tenants, providing a space for relaxation and rejuvenation for all.

Spa Massage room



Second floor legend

1. Retail Shop
2. Supermarket second level
3. Pc gaming lounge
4. Playstation Lounge
5. Table games
6. Bar seating
7. Spa reception
8. Staff offices
9. Staff break room
10. Massage rooms
11. Sauna
12. Indoor pool
13. Washrooms
14. Locker room
15. Lift and Stairwell
16. Washrooms
17. Management Offices

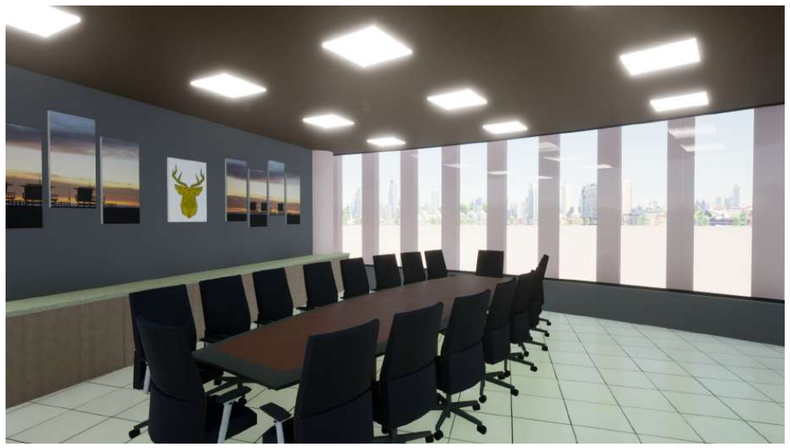
THE HOTEL

The luxury hotel, located on the 3rd and 4th floors, is designed to cater to the local and expatriate community in Westlands, offering premium accommodations for business travelers and international visitors. Its position on the higher levels not only reduces noise from traffic but also captures sweeping views of Nairobi's skyline, providing guests with a tranquil and scenic retreat.

It Includes:

1. Conference facilities

The hotel offers a range of state of the art boardrooms and conference rooms of varied sizes including an auditorium, providing flexible spaces to host business meetings, corporate events, and other special occasions. These spaces are designed to accommodate the needs of both small, intimate gatherings and larger, formal and social events.



Hotel Boardroom

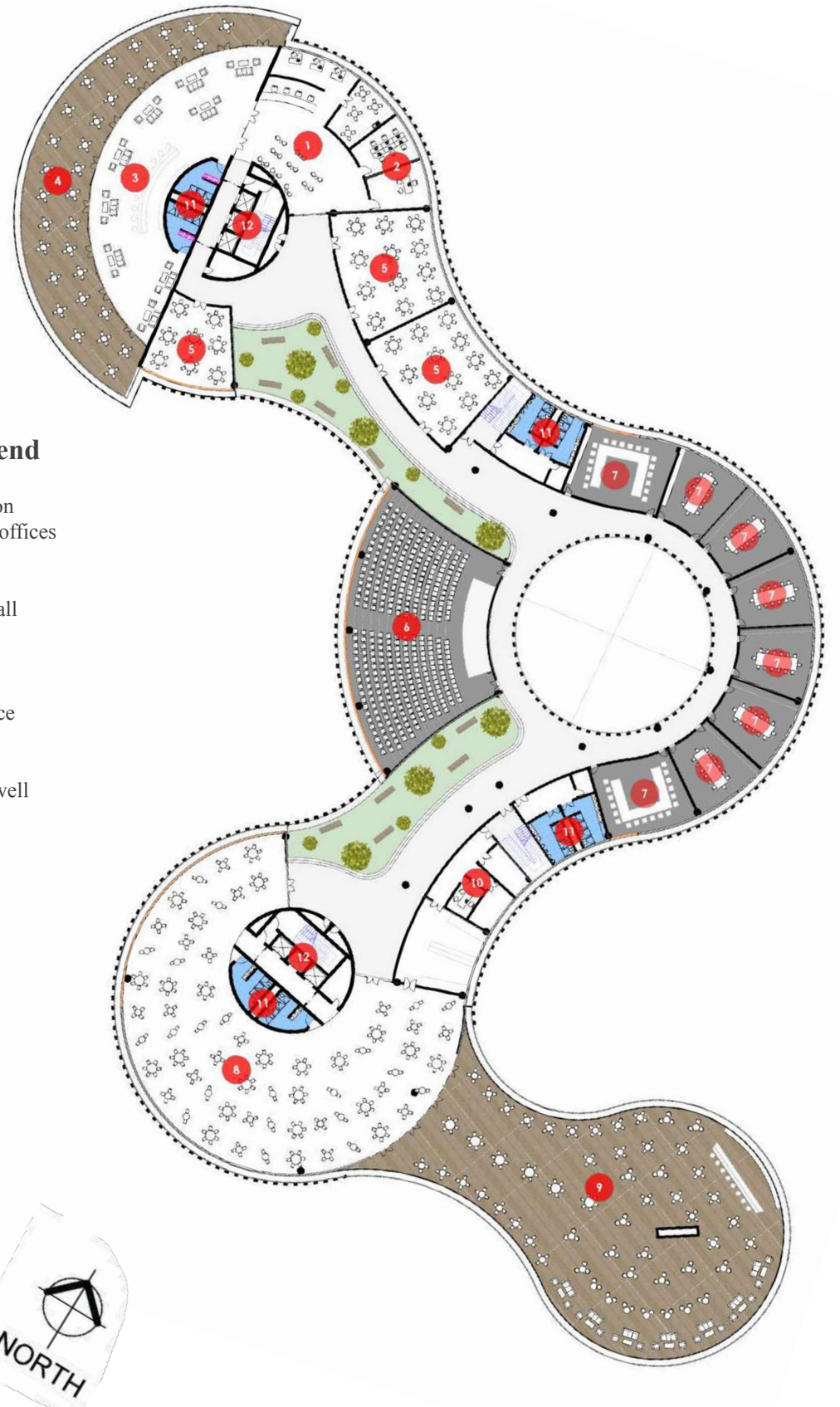
2. Restaurant with Rooftop Terrace:

The hotel boasts a large restaurant, complemented by a rooftop terrace that provides a picturesque setting for dining. The restaurant is also available for hire, making it a prime location for wedding receptions and other special events, combining elegance with a stunning outdoor atmosphere..

3. Indoor Landscaped Courtyard:

At the heart of the hotel is an indoor landscaped courtyard, offering a peaceful, green oasis where guests can relax in nature-inspired surroundings. This serene space enhances the luxurious experience and provides a unique retreat within the hotel.

Hotel Boardroom



Third floor legend

1. Hotel reception
2. Management offices
3. Bar lounge
4. Bar terrace
5. Conference hall
6. Auditorium
7. Boardroom
8. Restaurant
9. Rooftop terrace
10. Kitchen
11. Washrooms
12. Lift and stairwell
13. Washrooms

THE HOTEL

5. Luxury Accommodation Rooms

The hotel's luxury accommodation includes rooms of varied sizes, tailored to meet the diverse needs of guests. From spacious suites to cozy single rooms, each space is designed with comfort and elegance, ensuring a premium stay for both short- and long-term visitors.

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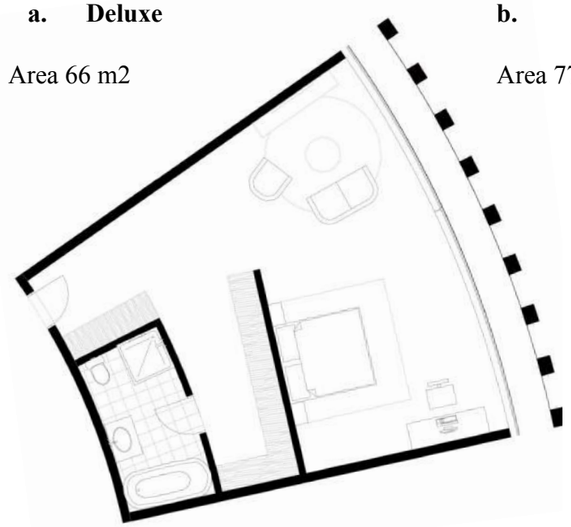
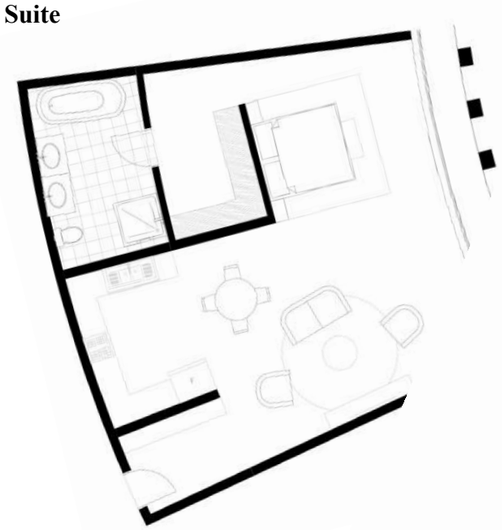
a. Deluxe

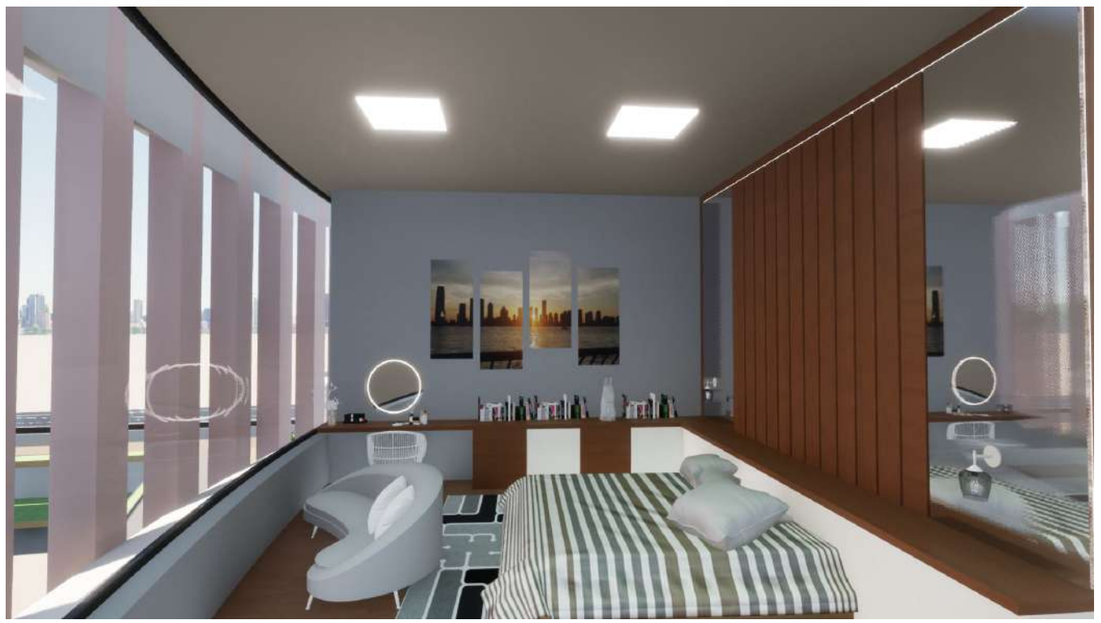
Area 66 m2



b. Junior Suite

Area 77 m2

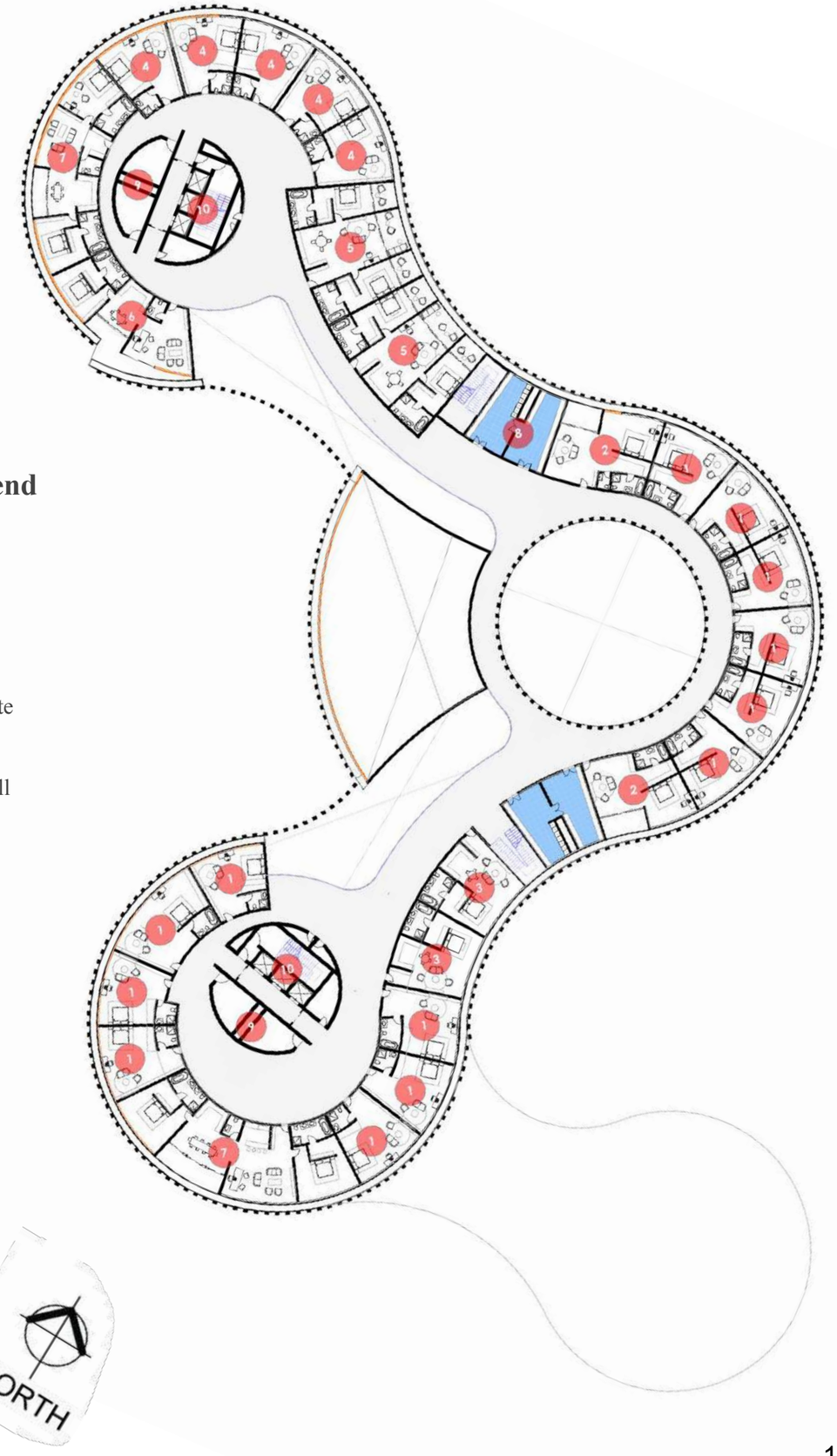




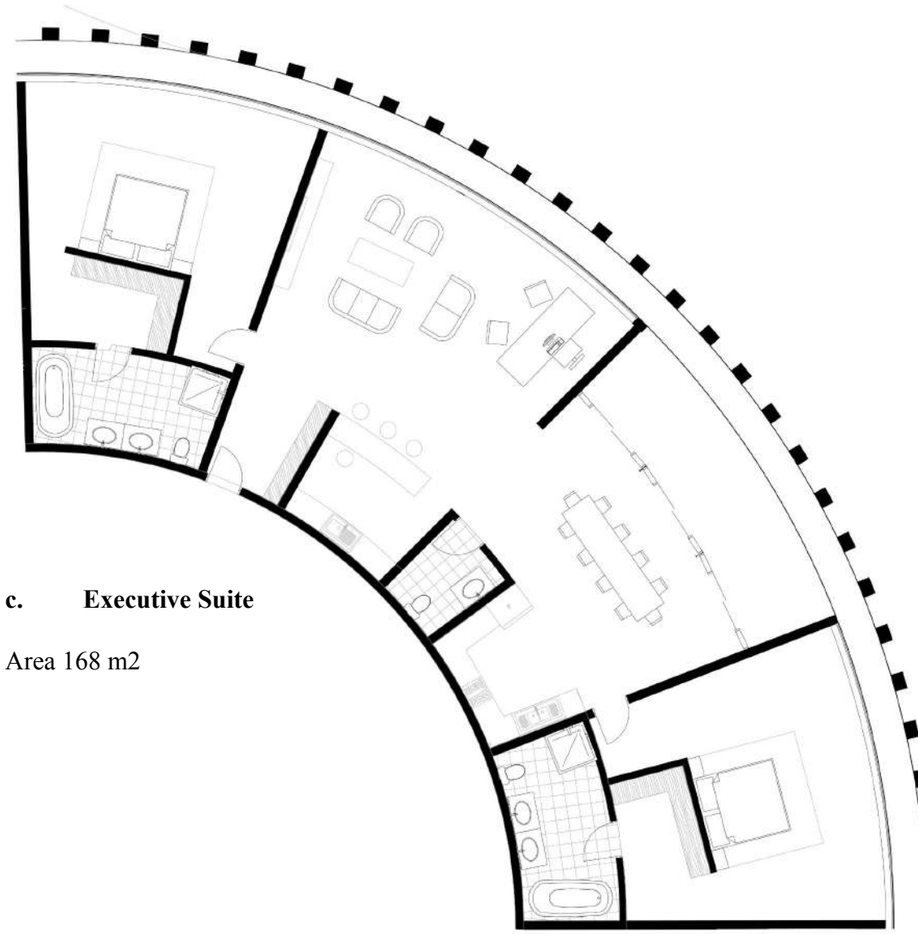
Typical Bedroom interior

Fourth floor legend

1. Deluxe room
2. Classic room
3. Junior Suite
4. Standard room
5. Executive suite
6. Luxury suite
7. Presidential Suite
8. Laundry room
9. Storage
10. Lift and stairwell



THE HOTEL



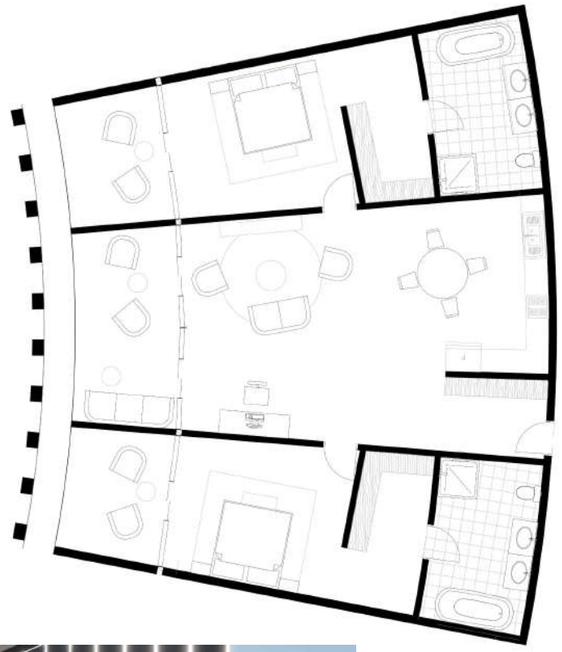
c. Executive Suite

Area 168 m2

Executive Suite dining room

c. Presidential Suite

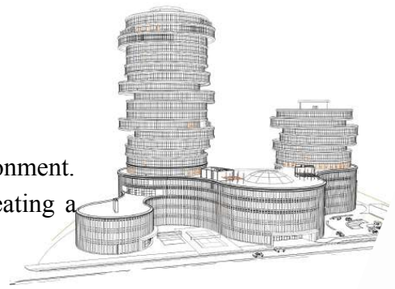
.rea 168 m2



Presidential suite bedroom

Presidential suite Balcony

CO- WORKING SPACE and ROOF GARDEN

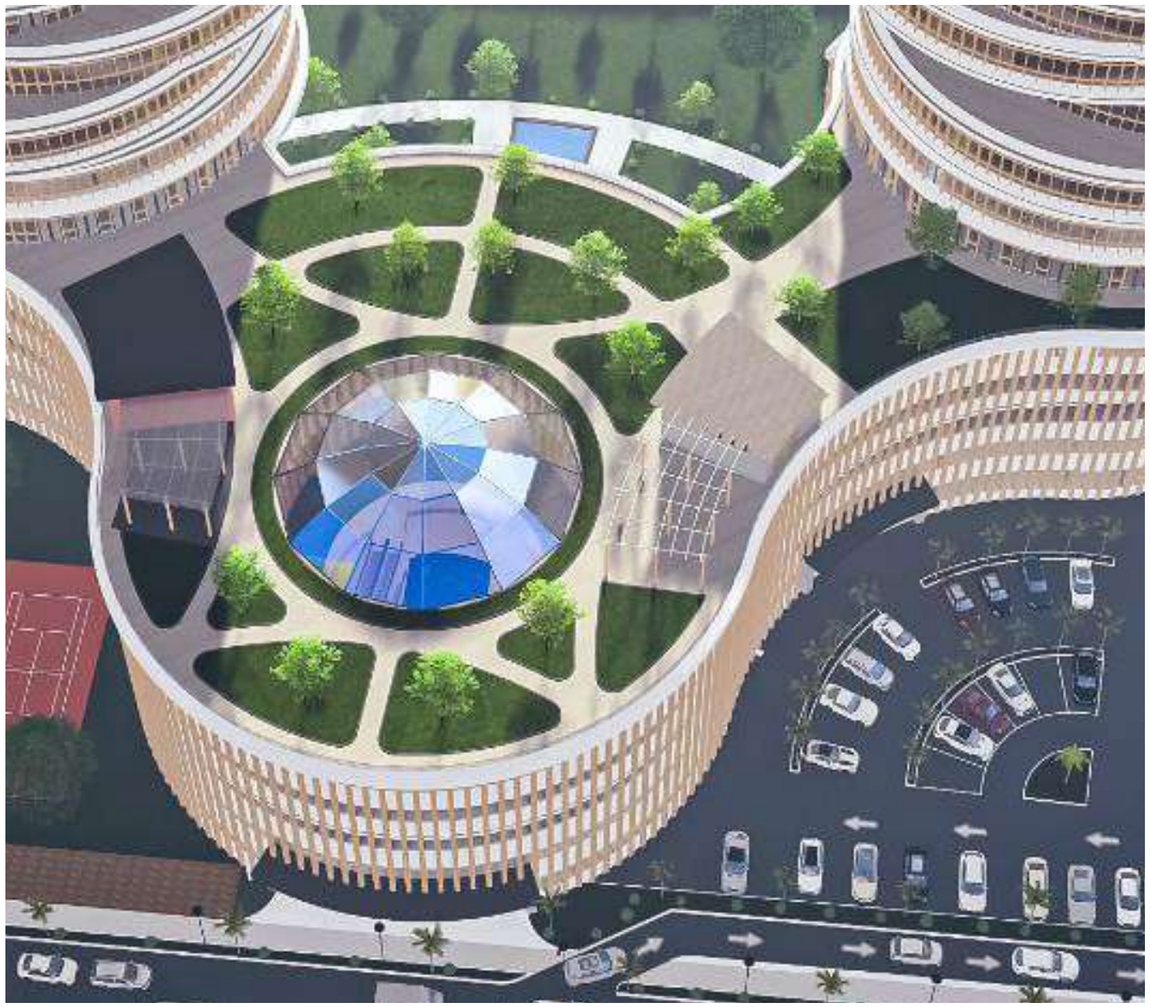


Positioned on the 5th floor, the rooftop garden offers a lush, green retreat amid the urban environment. This thoughtfully designed space features a charming gazebo and an array of plant life, creating a tranquil oasis with stunning views of the city.

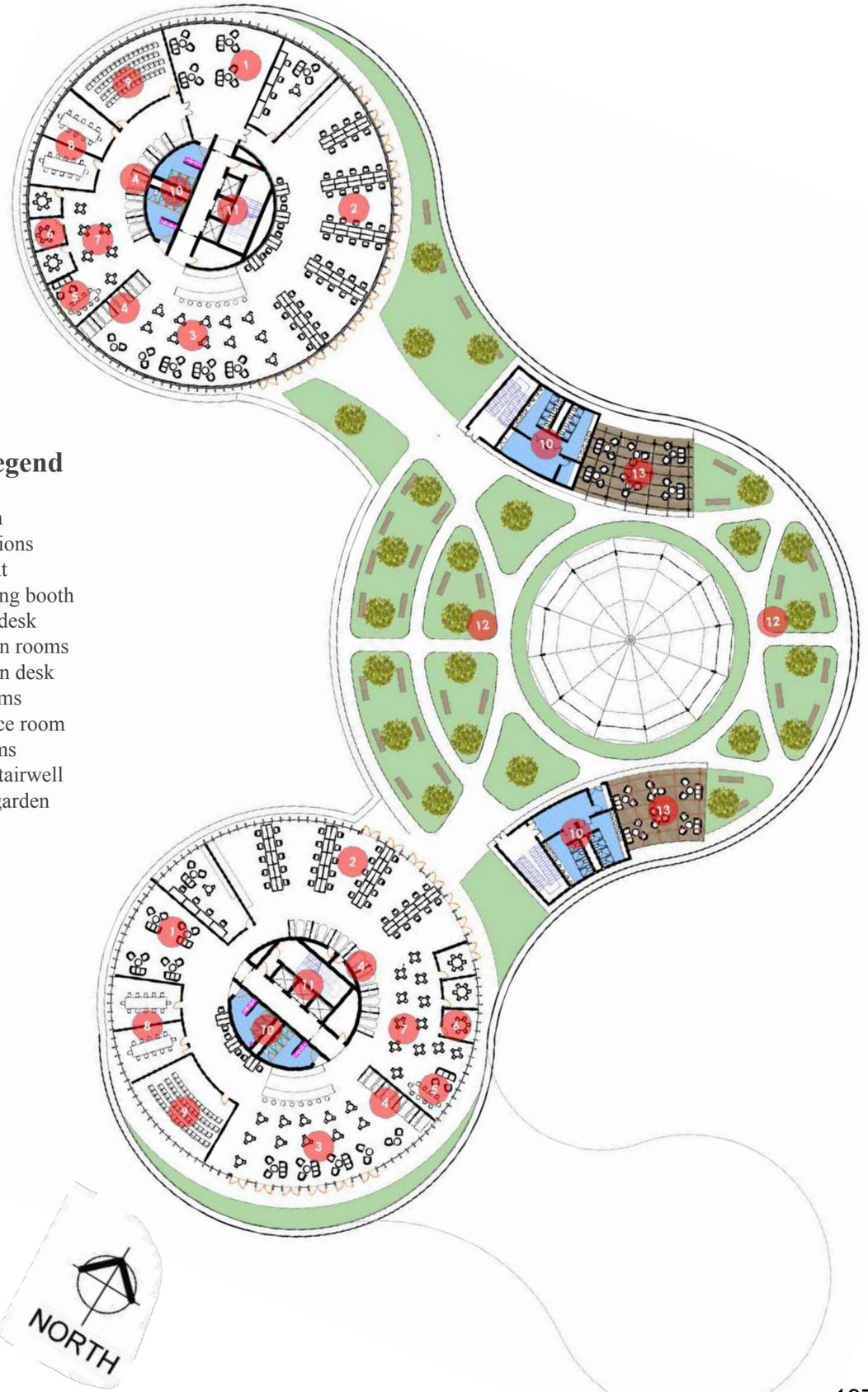
Beyond its aesthetic appeal, the rooftop garden contributes to sustainability efforts by helping to reduce the urban heat island effect, which can significantly lower surrounding temperatures.

It also promotes biodiversity by providing habitat for local flora and fauna. Additionally, the garden enhances building insulation, potentially reducing energy consumption for cooling and heating.

This elevated green space not only offers a peaceful environment for relaxation and social gatherings but also supports environmental and ecological well-being



Rooftop garden



Fifth floor legend

1. Reception
2. Work stations
3. Restaurant
4. co -working booth
5. Standing desk
6. Discussion rooms
7. Discussion desk
8. Boardrooms
9. Conference room
10. Washrooms
11. Lift and stairwell
12. Rooftop garden
13. Gazebo

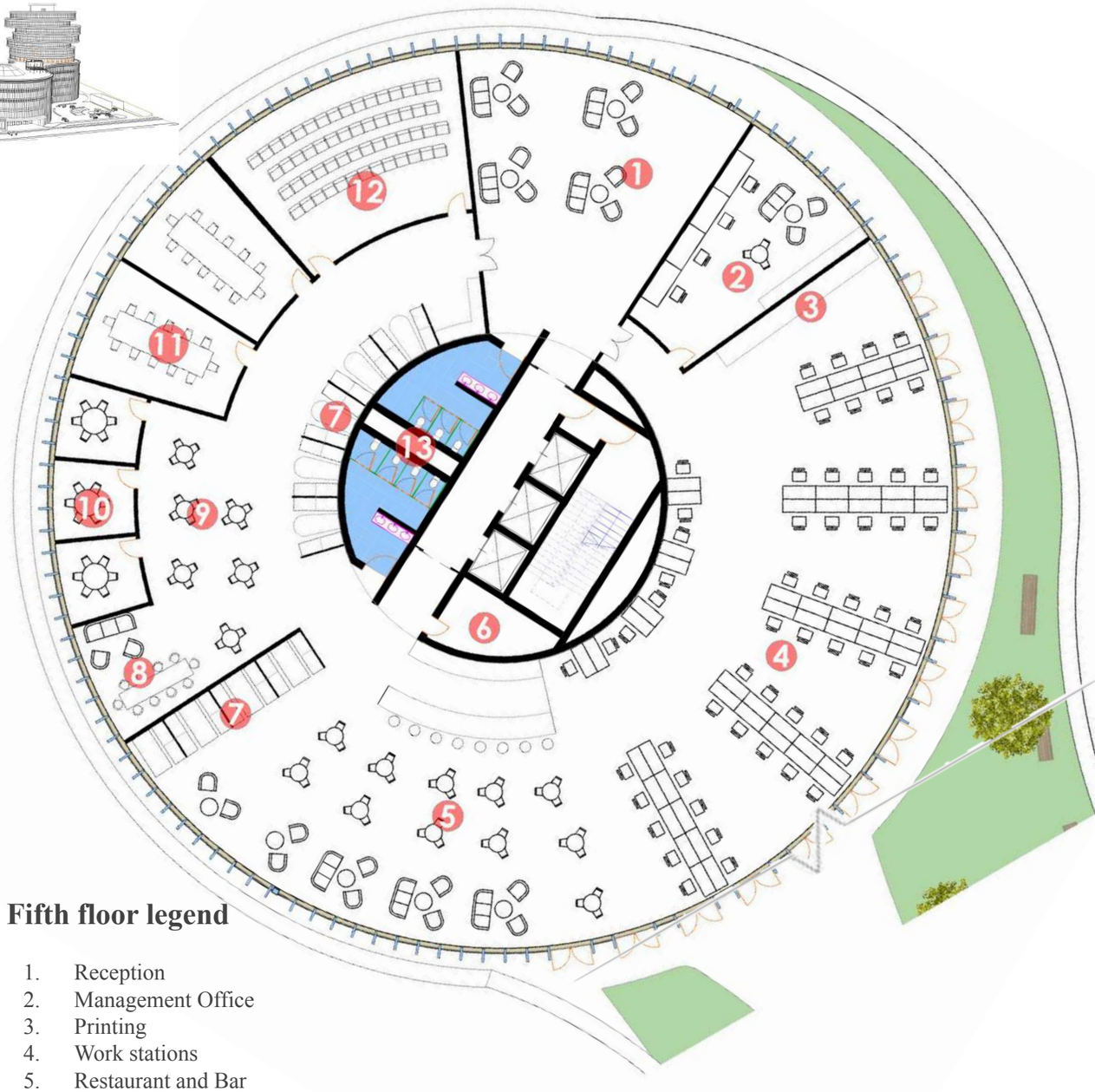
CO- WORKING SPACE and ROOF GARDEN

Located on the 5th and 6th floors, the co-working space is crafted to provide an innov collaborative work environment. These spaces offer modern, flexible workstations designed entrepreneurs, freelancers, and small businesses.

The co-working space includes versatile workstations, discussion rooms, boardrooms, and conference rooms. It also offers private co-working booths for focused tasks and features a restaurant and bar for dining and socializing.

Work Pods

Co-Working space



Fifth floor legend

1. Reception
2. Management Office
3. Printing
4. Work stations
5. Restaurant and Bar
6. Kitchen
7. Co-working booth
8. Standing table
9. Discussion tables
10. Private discussion roo
11. Boardroom
12. Conference room
13. Washrooms

OFFICE SPACE

the office spaces Located between the 6th and 15th floors, feature an open-plan layout, offering flexibility to accommodate organizations of varying sizes.

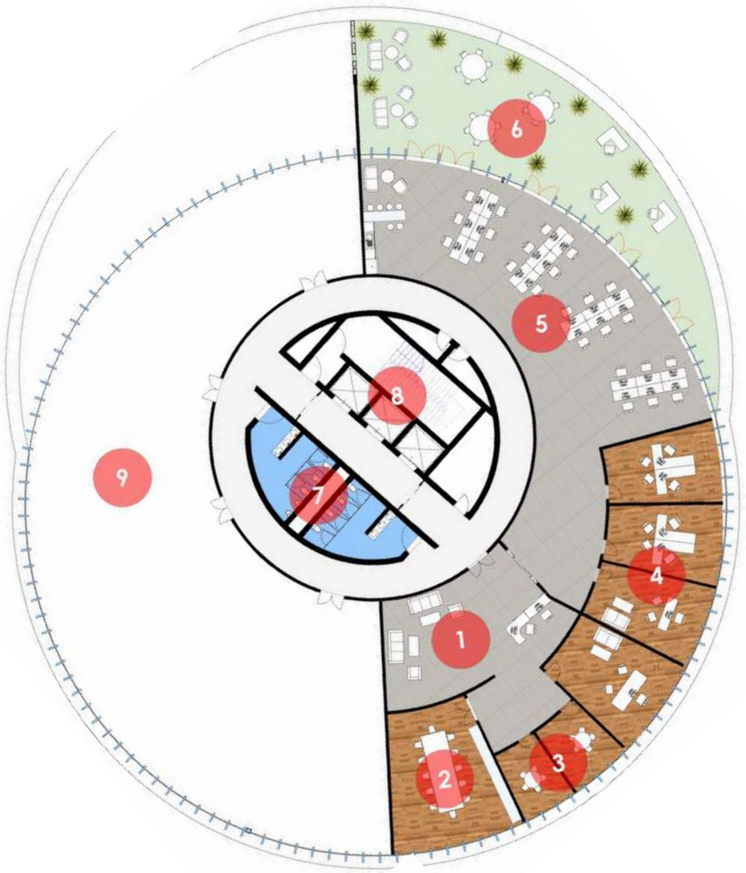
This design allows businesses to customize their workspace according to their specific needs. Some offices include private balconies, offering fresh air and outdoor space, while all provide stunning panoramic views of the city.These features contribute to a professional and Productive work environment.

Office Boardroom

Office Work space

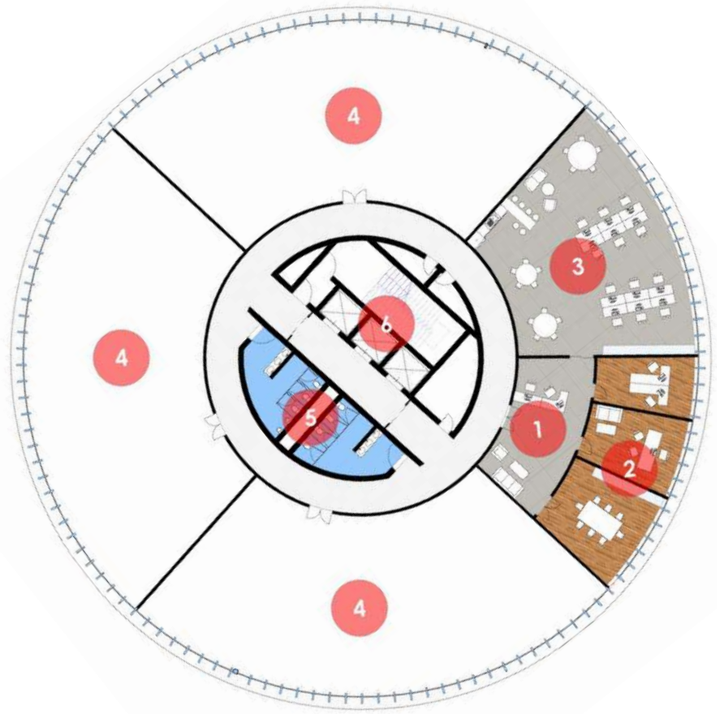
10th floor Plan legend

1. Reception
2. Boardroom
3. Breakout room
4. Private offices
5. Workstations
6. Terrace
7. Washrooms
8. Lifts and Stairwell
9. Open office space to rent



12th floor Plan legend

1. Reception
2. Private offices
3. Workstation
4. Office space to
5. Washrooms
6. Lifts and stairwell



RESIDENTIAL

Situated on the 17th to 24th floors, the apartments offer a range of living options, from cozy 1-bedroom units to expansive 3-bedroom penthouses.

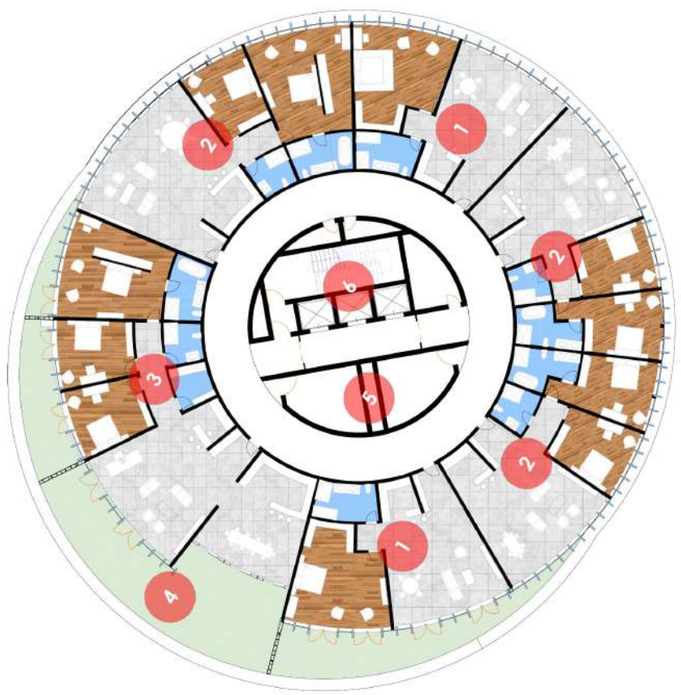
Each apartment boasts panoramic views of the city, ensuring residents enjoy the stunning skyline from the comfort of their homes.

Located on the topmost floors, these residences provide a high level of privacy, making them a peaceful retreat away from the bustling lower levels of the building.

Office Break Area

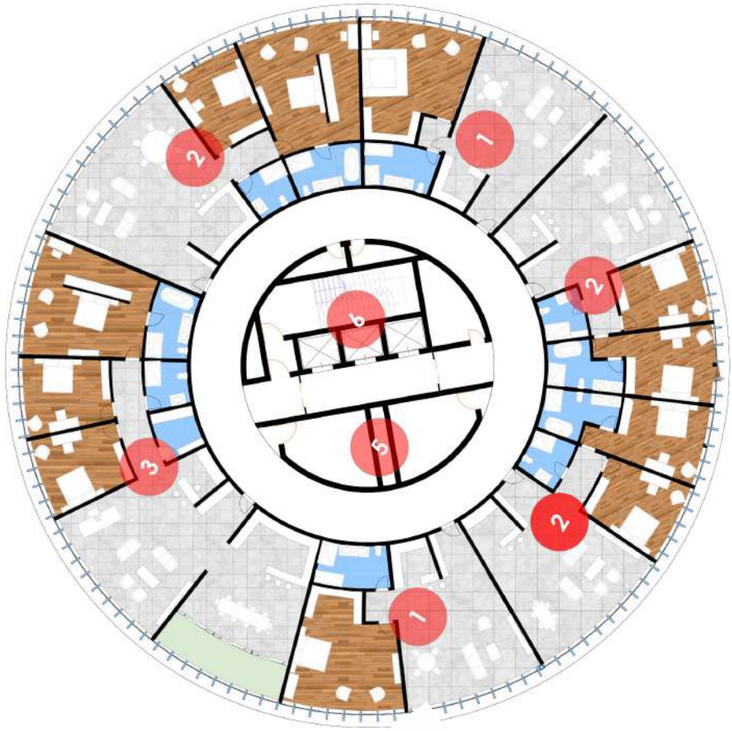
17th floor legend

1. One Bedroom apartment
2. 2 bedroom apartment
3. 3 bedroom apartment
4. Balcony
5. Storage
6. Lifts and Stairwell



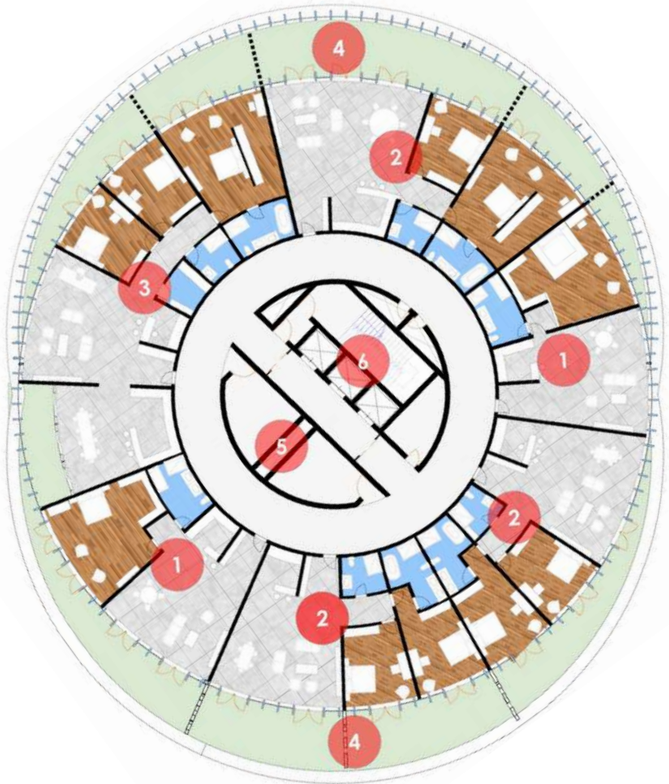
18th floor legend

1. One Bedroom apartment
2. 2 bedroom apartment
3. 3 bedroom apartment
4. Balcony
5. Storage
6. Lifts and Stairwell



20th floor legend

1. One Bedroom apartment
2. 2 bedroom apartment
3. 3 bedroom apartment
4. Balcony
5. Storage
6. Lifts and Stairwell



PINNACLE TOWERS

Design Strategy

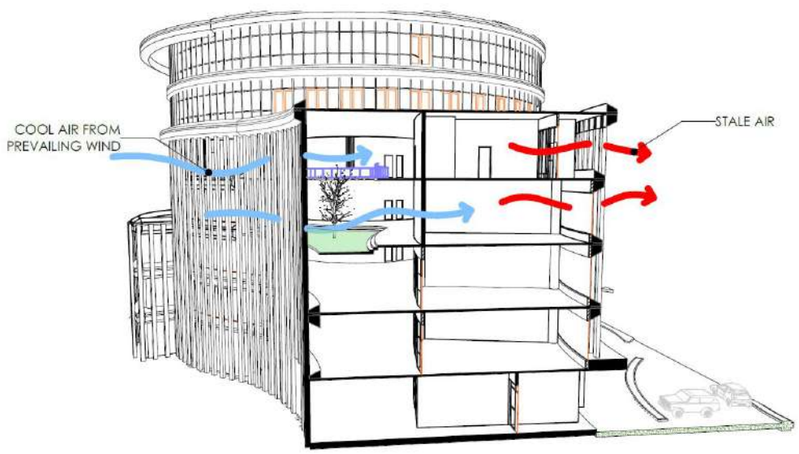
1. Passive Design

Solar orientation: The circular shape of the building allows for optimal solar orientation, with window walls designed to capture sunlight throughout the day. Vertical fins are designed on the window walls to provide sunshading to the interiors.

Daylighting: Ample daylight floods the interior spaces of the skyscraper, reducing reliance on artificial lighting during daylight hours. Large windows and strategically placed skylights ensure even distribution of natural light, creating inviting and productive environments for occupants.

Natural ventilation: The circular design promotes natural ventilation by facilitating cross breezes and airflow throughout the building. Operable windows and vents strategically placed along the perimeter allow for the regulation of indoor air quality and temperature, enhancing occupant comfort.

Natural landscaping: Green spaces and vegetation are incorporated into the design, providing natural shading and contributing to a healthier indoor environment. Rooftop gardens and green roofs help to mitigate heat island effects, improve air quality, and create inviting outdoor spaces for relaxation and recreation.



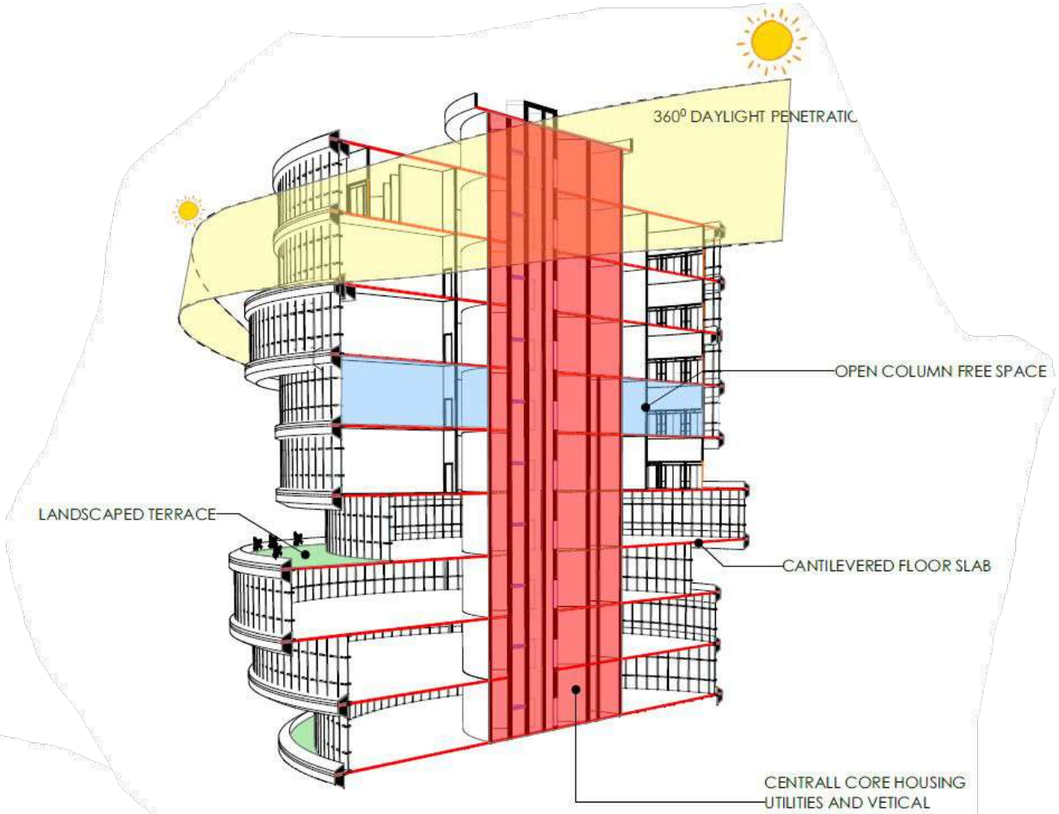
Cross-Ventilation through courtyard

2. Core structural system (cantilevered plate structure)

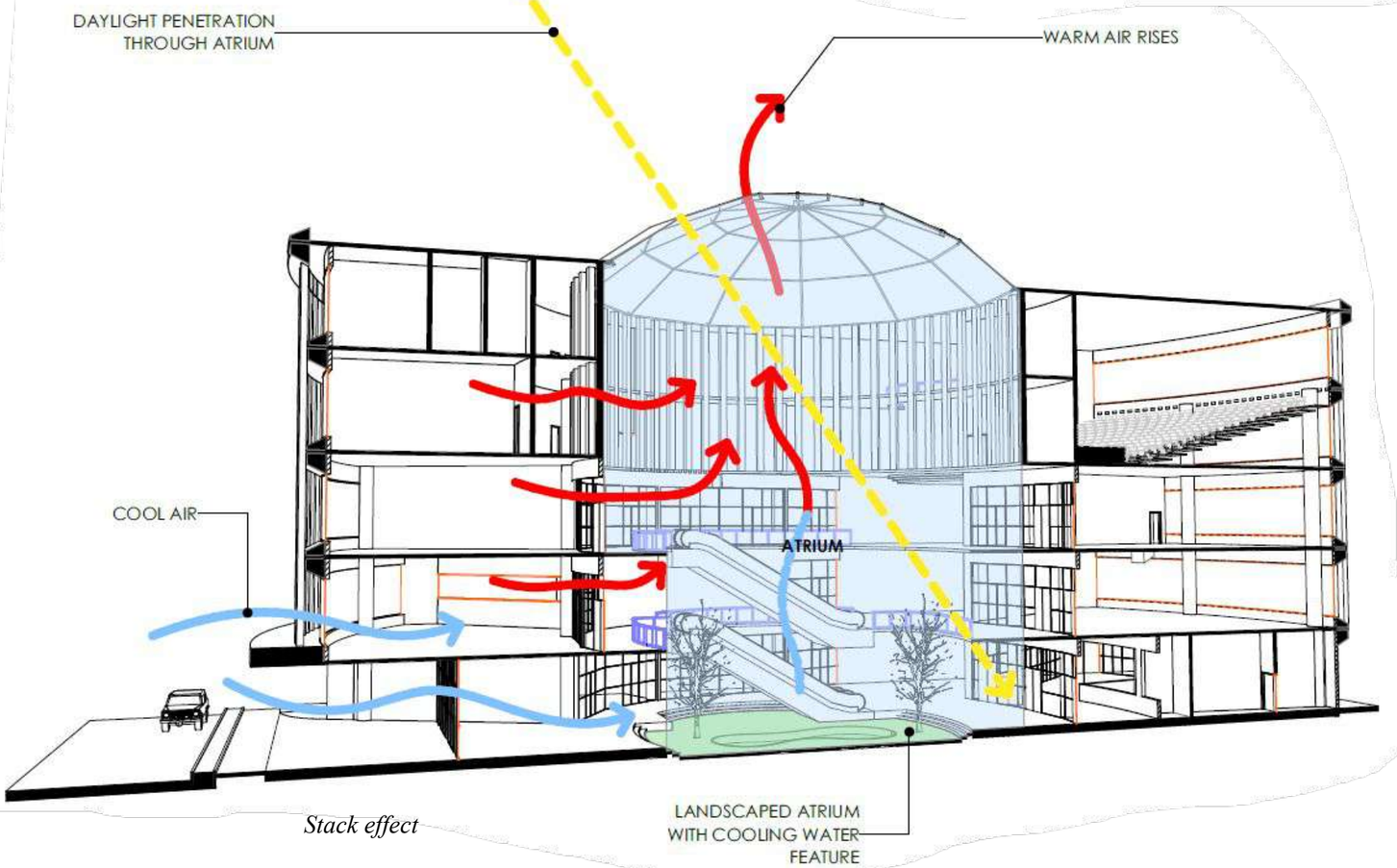
Support: The core, which houses elevators, staircases, and utility shafts, has floor slabs extending from it, creating a cantilevered structure. This design maximizes floor space by eliminating the need for interior support columns.

Stability: The core maintains stability through engineering techniques such as pre-stressing of structural members. Strategically placed reinforcements, including steel braces and concrete shear walls, ensure that the structure remains secure and resilient. High-strength materials such as high-strength concrete and steel are used to enhance stability.

Space efficiency: By housing vertical circulation and utility systems within the cantilevered core, more floor area is freed up for usable space. This optimizes the building's footprint and allows for greater flexibility in layout and design.

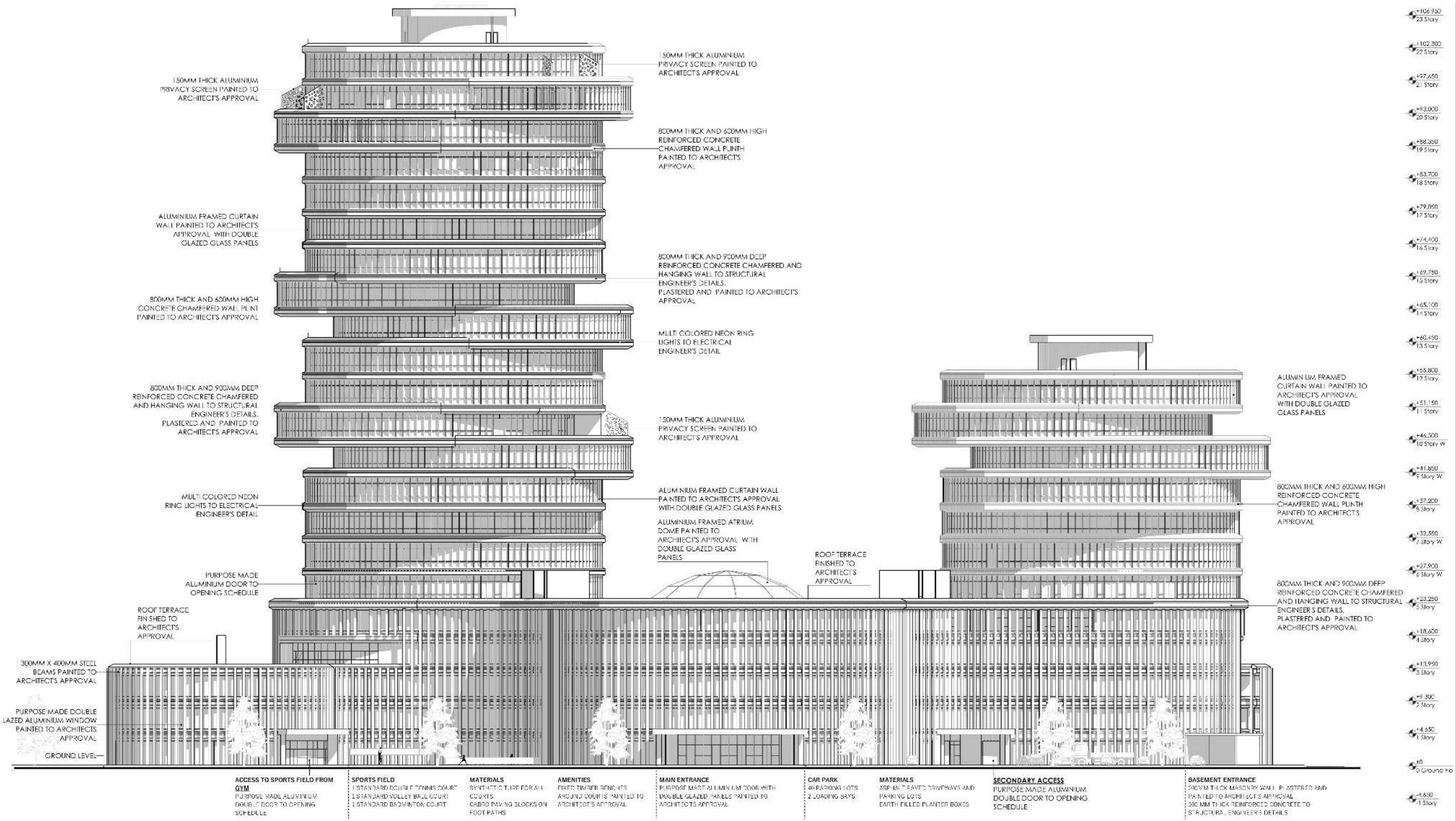


Cantilevered Plate Structural System



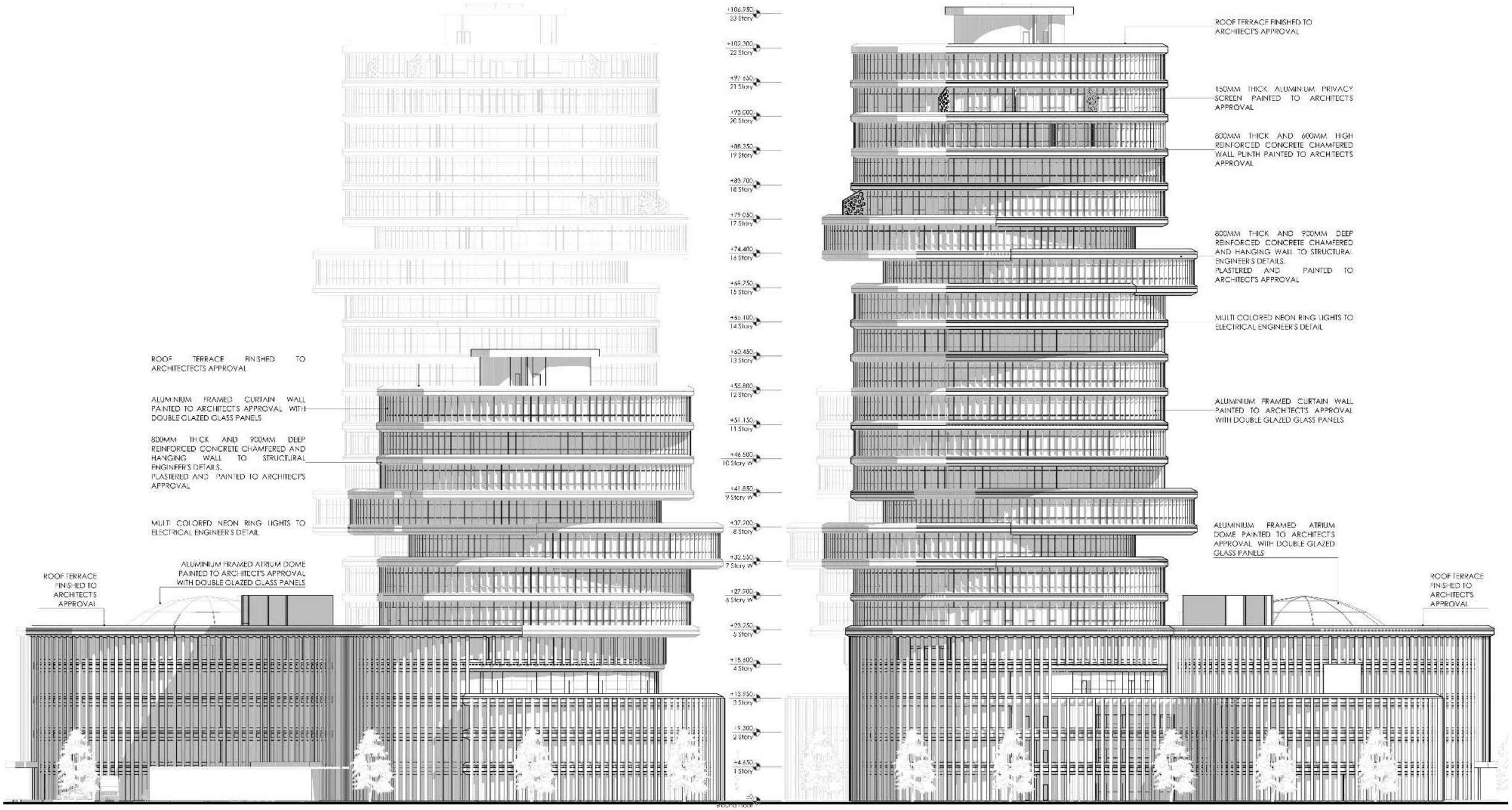
Stack effect

ELEVATION DETAILS



ELEVATION 01
SCALE 1:200

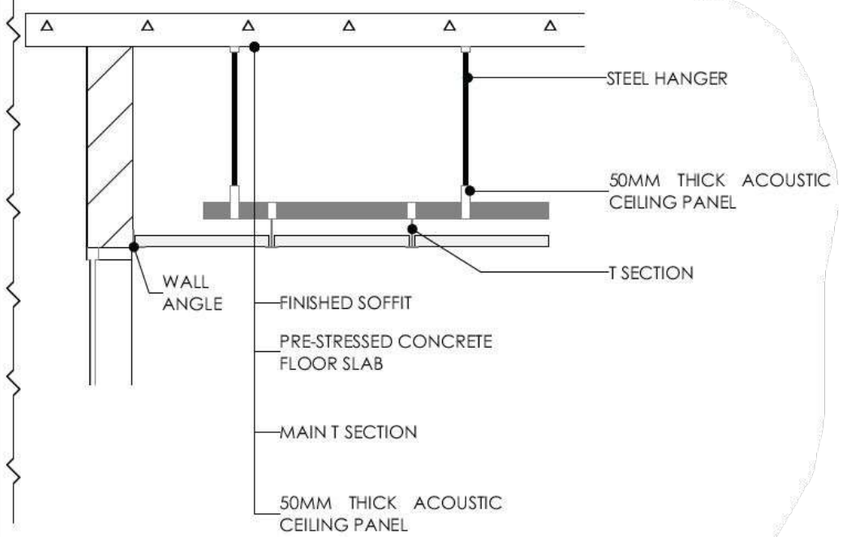
ELEVATION DETAILS



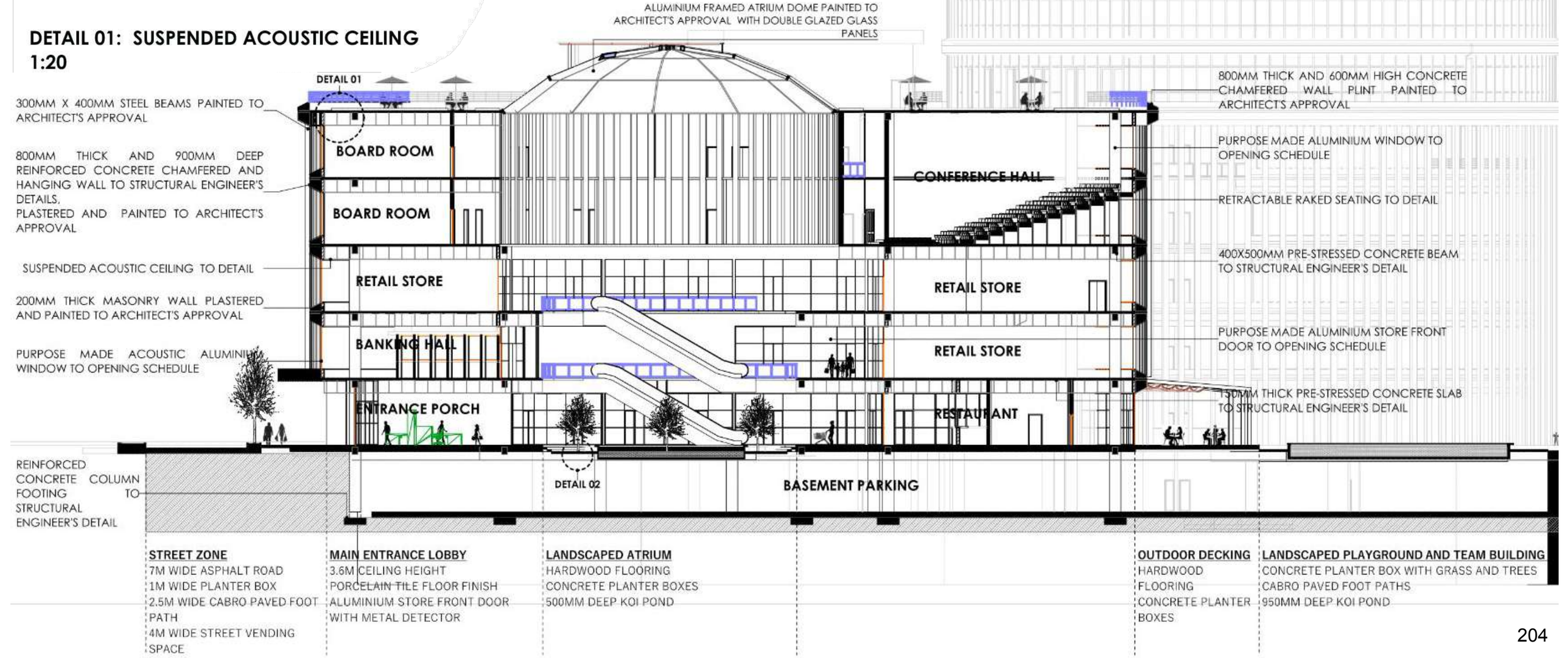
ELEVATION 02
SCALE 1:200

ELEVATION 03
SCALE 1:200

SECTION DETAILS



DETAIL 01: SUSPENDED ACOUSTIC CEILING 1:20



STREET ZONE
7M WIDE ASPHALT ROAD
1M WIDE PLANTER BOX
2.5M WIDE CABRO PAVED FOOT PATH
4M WIDE STREET VENDING SPACE

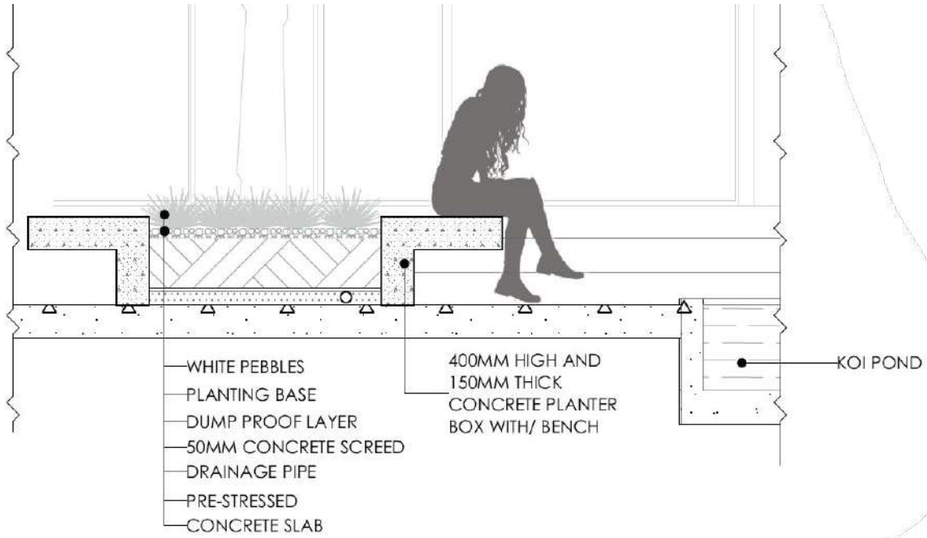
MAIN ENTRANCE LOBBY
3.6M CEILING HEIGHT
PORCELAIN TILE FLOOR FINISH
ALUMINIUM STORE FRONT DOOR WITH METAL DETECTOR

LANDSCAPED ATRIUM
HARDWOOD FLOORING
CONCRETE PLANTER BOXES
500MM DEEP KOI POND

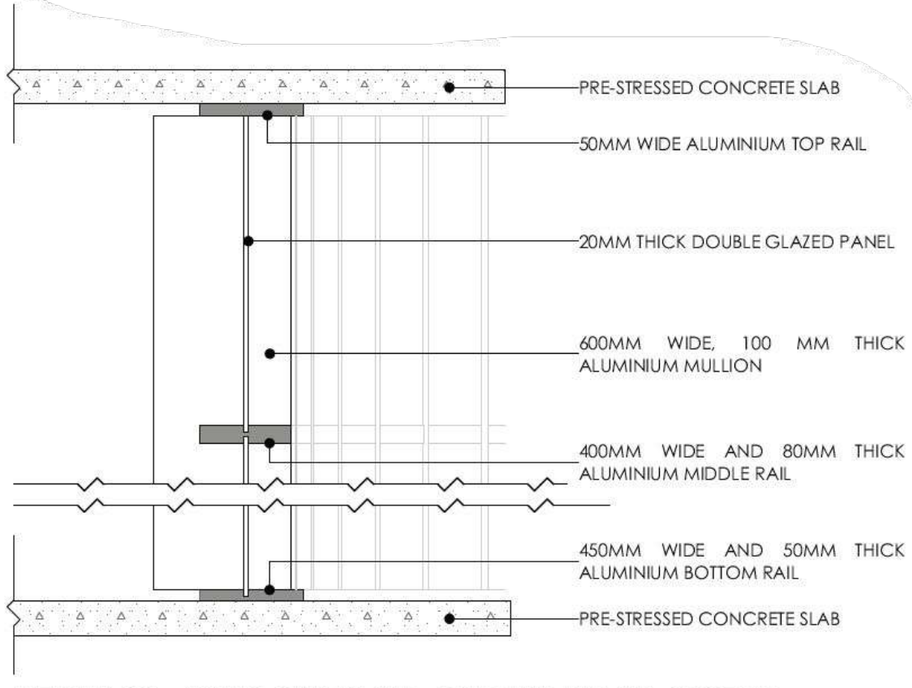
OUTDOOR DECKING
HARDWOOD FLOORING
CONCRETE PLANTER BOXES

LANDSCAPED PLAYGROUND AND TEAM BUILDING
CONCRETE PLANTER BOX WITH GRASS AND TREES
CABRO PAVED FOOT PATHS
950MM DEEP KOI POND

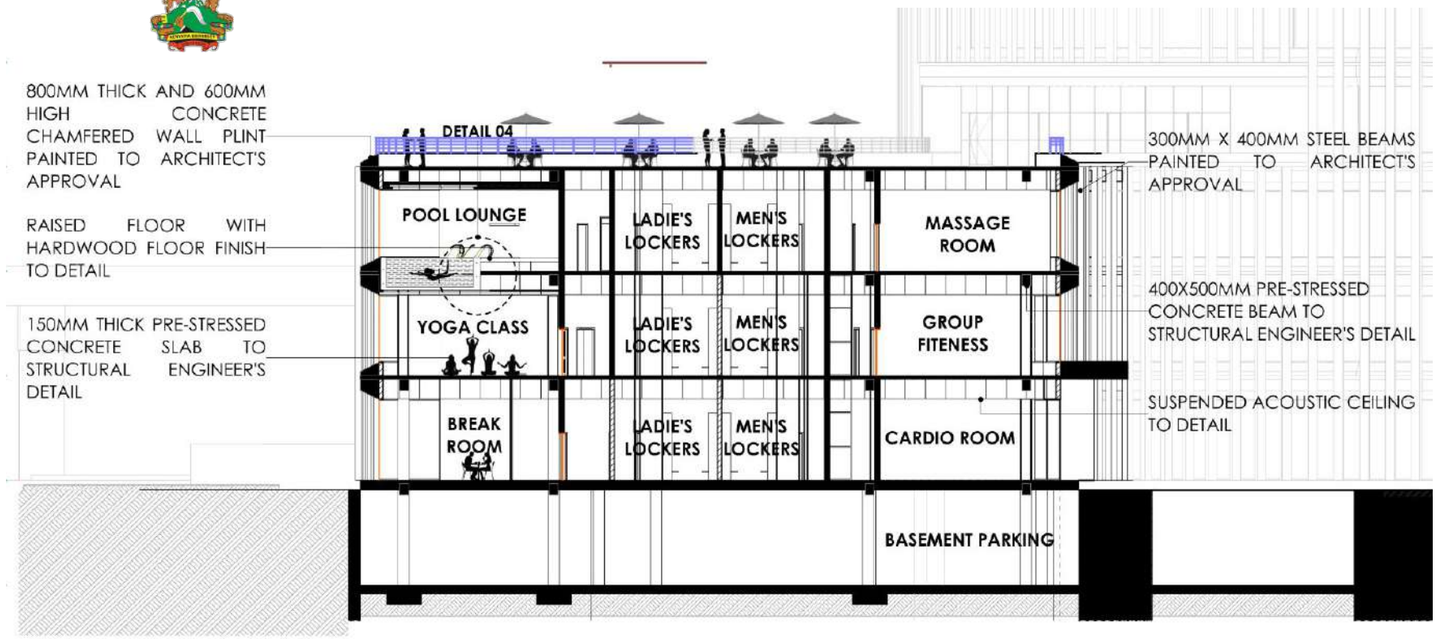
SECTION DETAILS

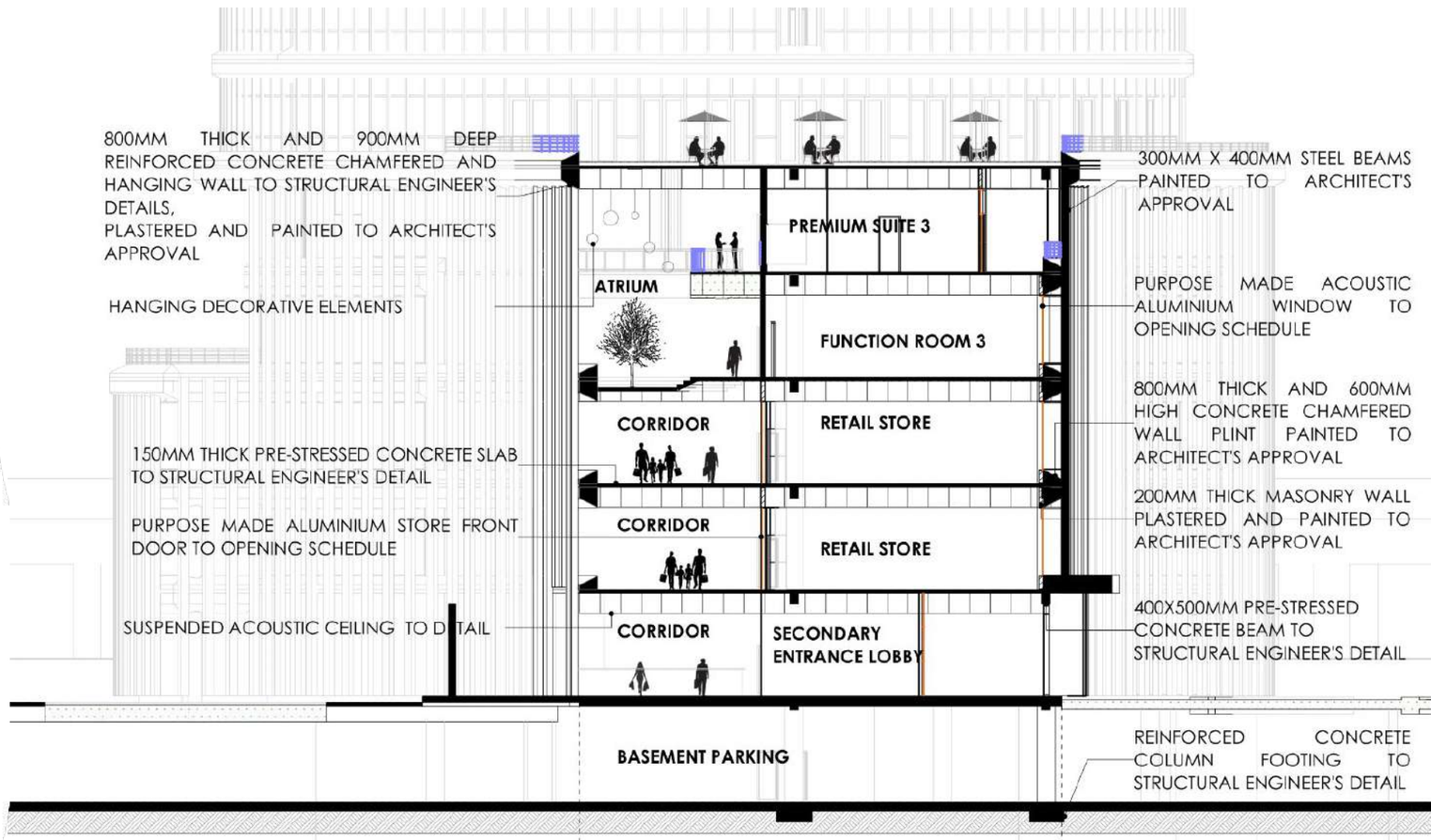


DETAIL 02: PLANTER BOX/ BENCH AT ATRIUM
1:20



DETAIL 03: WINDOW WALL, CURTAIN WALL SYSTEM
1:20



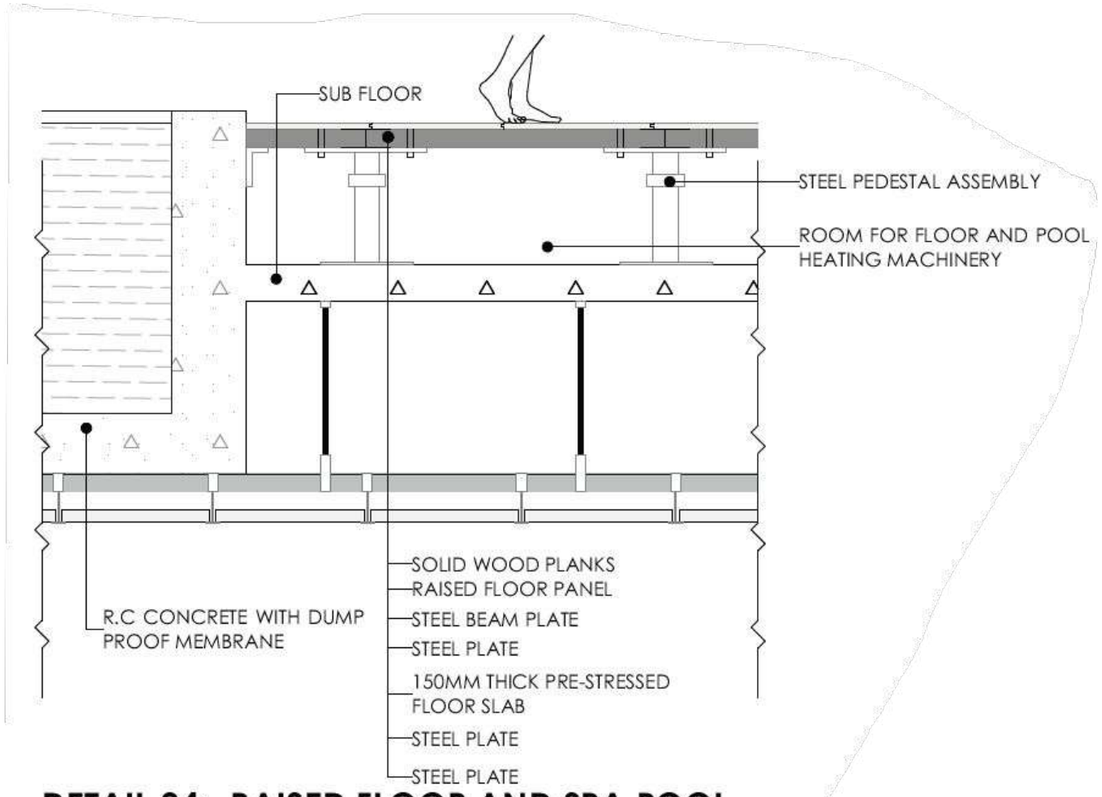


LANDSCAPED PLAYGROUND AND TEAM BUILDING AREA
CONCRETE PLANTER BOX WITH GRASS AND TREES
KOI POND
CABRO PAVED FOOT PATHS
950MM DEEP KOI POND

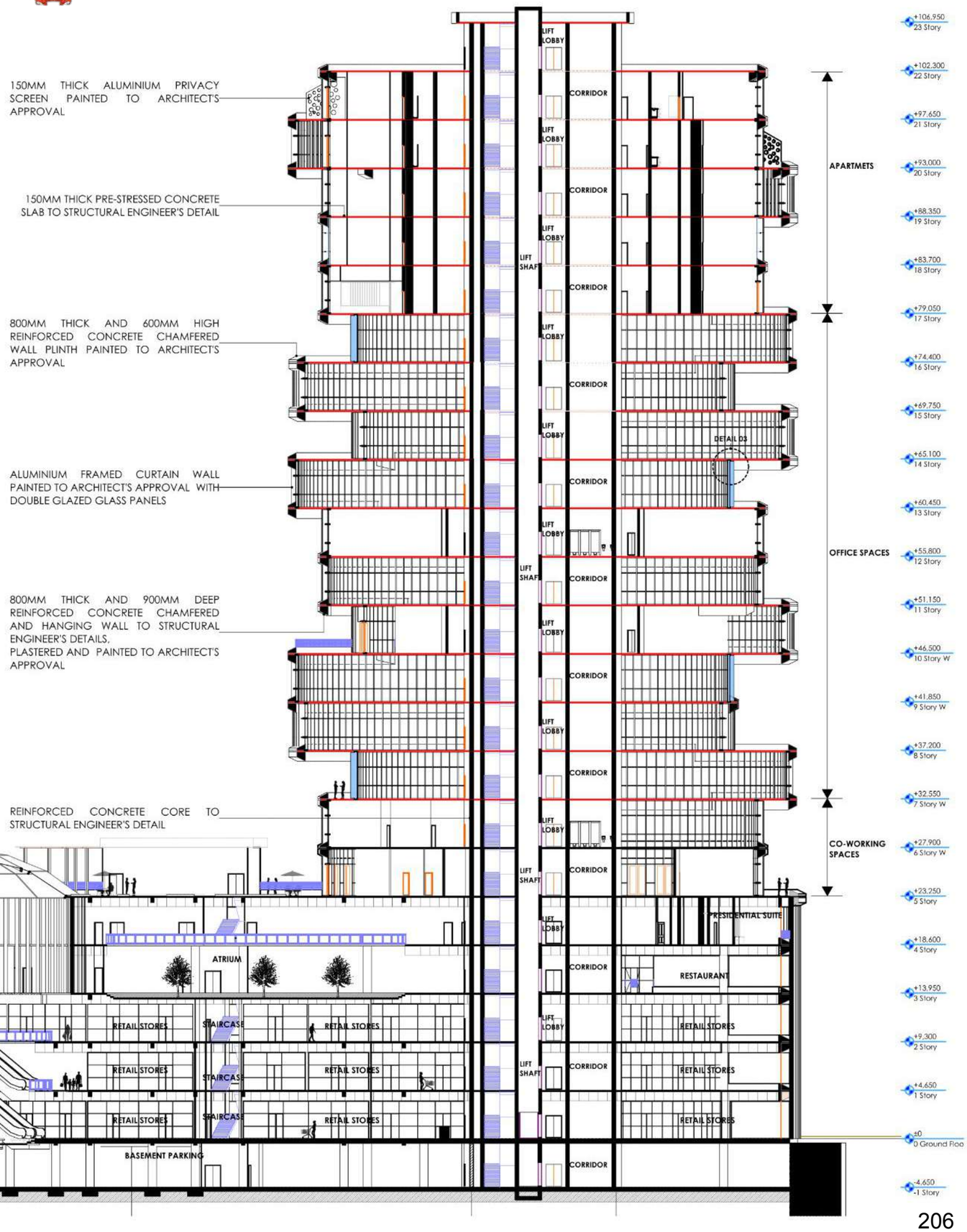
CORRIDOR AND SECONDARY ENTRANCE LOBBY
3.6M CEILING HEIGHT
PORCELAIN TILE FLOOR FINISH
ALUMINIUM STORE FRONT DOOR WITH METAL DETECTOR

CAR PARK
40 PARKING LOTS
2 LOADING BAYS
ASPHALT PAVED DRIVEWAYS
CONCRETE PLANTER BOXES

SECTION DETAILS



DETAIL 04: RAISED FLOOR AND SPA POOL
1:20



Kenyatta University is home to some of the world's top scholars, researchers and experts in diverse fields. The university takes pride in providing high quality programmes that attract individuals who wish to be globally competitive. To achieve this, it has invested heavily in infrastructure and facilities that offer students the best experience in quality academic programmes under a nurturing environment in which our students learn and grow. Kenyatta University is one of the leading universities in Kenya. On the 21st of March 2024, Kenyatta University was ranked No. 2 in Kenya, 38 in Africa and 2230 in the world. According to the Edurank website, the ranking based on research output, non-academic prominence and alumni influence. The University aims to not only to maintain this position, but to also improve further and attain its vision of becoming a world-class university that is committed to quality and relevance. What gives graduates of Kenyatta University a cutting edge over their peers is the University's emphasis on practical hands-on knowledge and the skills training imparted to its students. Towards this noble end, Kenyatta University has established meaningful links with partners in industry, who guide the University on practical, professional requirements which need to be built into learning programmes. As a result, the University's courses give graduates a distinct advantage in the workplace. Many graduates are exposed to new employment opportunities by accessing industrial attachments during their study, or through course related placements.

The Department of Architecture & Interior Design's (DAID) is committed to the pursuit of quality through teaching, research and development. It also strives to provide timely services that foster and develop academic excellence in basic and applied research at all levels of study. In this way, it aspires to train practice-oriented manpower, who can contribute innovatively and effectively to social, intellectual and academic development. The department, together with the school of Engineering and Architecture that it is nested in, aims at providing training in the planning, formulation and implementation of built forms, that range from the individual dwellings, communities and cities. The ever-rising demand for dwellings spaces that are sustainable and economically efficient requires learning to the highest levels possible. In line with the University's goals, the Department of Architecture & Interior Design's (DAID) endeavours to continually improve its services, products, processes, methods, and work environment to ensure that each learner receives the highest quality service or product at the committed cost and on time. Sustainability is the underlying principle within the learning curriculum in the Department's green based philosophy. The programme is based on the understanding that the skills required for designing the built environment come from a broad education that draws on science, technology, and humanities within the totality of natural environmental systems. These then are complemented with the additional skills of thinking spatially. Learners in the Department are inducted into these skills through focused practical learning. This is done through studio portfolio instruction that relies on designs that simulate real life settings. The Department has a good complement of qualified, vibrant ,full time and part time ,local and international staff. These staff present with a mix of staff that are intensely pursuing practicing in industry and others whose primary drive is instructional and research scholarly work. Learning here is well supported with adequate learning spaces in form of studios, wood & metal workshops, lecture rooms, computer laboratories and libraries.

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Prof. Arch. Paul Mwangi Maringa is the immediate past Principal Secretary for Infrastructure in the Government of Kenya (2019-2022). He previously served as the Principal Secretary for Public Works from November 2015 to March 2017. He later transitioned to the State Department of Transport. In September 2018, he returned to the State Department of Public Works.

Prof. Maringa has over 30 years of experience in public service, academia, and consultancy. He is an Architect and Planner, who holds a Doctor of Philosophy in Environmental Planning from the Jomo Kenyatta University of Agriculture and Technology (JKUAT) and a Master of Arts in Urban and Regional Planning from the University of Nairobi. He trained as an architect at the University of Nairobi where he attained an Honours degree in Architecture.

Professor Maringa pioneered the School of Architecture and Building Sciences (SABS) at Jomo Kenyatta University of Agriculture and Technology (JKUAT) and the Faculty of Architecture and Environmental Design (FAED) at the Kigali Institute of Science and Technology (KIST), where he also served as a Deputy Vice Chancellor Academic Affairs. This Faculty was subsequently re-named as the School of Architecture and Built Environment (SABE) and incorporated into the University of Rwanda (UR). He is a prolific author of research papers, book chapters, research monographs, and book reviews, while also serving as a referee, associate editor and editor-in-chief of various other scholarly outputs. Further, he has organized a considerable number of workshops and seminars.

Arch. Moses Gathua, (B.Arch. Hons, M. UIDM), MAAK, Lecturer, DAID, SEA, KU.

Moses is the Director in charge of Architecture and Design, Environmental and Development Planning Services at Anwani Architects. Gathua has over 15 years' experience most of which were gained working in the design capitals of Africa, Cape Town and Johannesburg, South Africa. He has also practiced in East and West Africa and holds a Bachelor of Architecture degree from Jomo Kenyatta University of Agriculture and Technology (JKUAT) School of Architecture and Building Sciences -SABS (2005) and a Master's degree in Urban Infrastructure Design and Management from the University of Cape Town -UCT. Gathua is a registered Architect with BORAQS, AAK and a Green building Council of South Africa Accredited Professional-GBCSA-AP and a NEMA certified EIA Expert. Moses is currently undertaking PhD studies at the University of Cape Town (UCT).

Dr. Arch. Rehab Hamdi Elnaggar, (PhD), EEE-Egyptian Engineer Syndicate, Lecturer, DAID, SEA, KU.

Rehab Hamdy Elnaggar is a lecturer, architect, and urban designer with 25 years of academic and professional experience. She has been a lecturer at Kenyatta University since 2021. Dr. Elnaggar began her academic journey by earning a Bachelor's degree (BSc Hons) in Architecture and Urban Design from Ain Shams University in 1997. She furthered her education by obtaining a Master's degree (MSc) from the same institution in 2007 and a PhD from Cairo University in 2015.

Dr. Elnaggar's teaching career spans nearly two and half decades, including her tenure at the Arab Academy for Science, Technology, and Maritime Transportation (AASTMT) from 2000 to 2019, and at Al Shorouk Academy from 2016 to 2019. Throughout these years, she has demonstrated an unwavering commitment to education and the advancement of architectural knowledge.

In parallel with her academic endeavours, Dr. Elnaggar has developed a robust professional practice. Since her graduation, she has designed and supervised the implementation of numerous significant and specialized projects, ranging from hospitals and residential towers to resorts, schools, private residences, showrooms, and a variety of interior design projects. Her dual career as an educator and practicing architect highlights her dedication to both the academic and practical dimensions of architecture and urban design.

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