DAID FORUM FOR RESEARCH AND DESIGN SOLUTIONS

2024/25,

VOL. II, STUDIO IV,

Design of Museums, Libraries and Exhibition Halls, Chapter Two: Site Analysis

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

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Chapter Two: Site Analysis.

DEPARTMENT OF ARCHITECTURE AND INTERIOR DESIGN (DAID)

SCHOOL OF ENGINEERING AND ARCHITECTURE (SEA)

KENYATTA UNIVERSITY (KU)

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

Department of Architecture and Interior Design (DAID),

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

Nairobi, Kenya.

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KENYATTA UNIVERSITY (KU)

DEPARTMENT OF ARCHITECTURE AND INTERIOR DESIGN (DAID) FORUM FOR RESEARCH AND DESIGN SOLUTIONS

FOREWORD

It is with great pride and joy that I present this book showcasing the architectural work of 4th year second semester Design Studio students work. This collection reflects not only the quality of their final designs but also the deep commitment, creativity, and growth each student has demonstrated throughout the semester.

This semester's focus on museum complexes, public libraries, and exhibition halls opened-up rich discussions on culture, memory, identity, and public space. It was a pleasure to journey alongside the students as we explored these essential typologies, unpacking their roles in society, their spatial demands, and their potential to inspire and connect communities.

I've been particularly impressed by the ability of the students to translate critical thinking into architectural form, and how their designs responded to context with sensitivity and ambition. Their dedication, willingness to learn, and capacity to push creative boundaries have made this studio a truly rewarding experience.

Thanks, my dear students for your hard work, resilience, and passion. I hope this book stands as a proud milestone in your academic path and a source of continued inspiration

Dr. Rehab Hamdy Elnaggar, Studio Master, Department of Architecture and Interior Design Kenyatta University, Nairobi, Kenya.

September 2025

EDITORIAL NOTE

Curiosity, inquiry, and the spark of discovery form the lifeblood of creative learning within the hallowed halls of academia. Here, the unlocking of imagination in architectural minds calls forth the bold and the supple, those who dare to wander the wilds of possibility while weaving their dreams within the measured loom of structured thought. The horizon of potential is as boundless as the designers themselves, each vision shaped by the unique tapestry of their context and illuminated by the wisdom of distant and local precedents, offering treasures both practical and profound.

We are delighted to unveil reflections that dance between freedom and order, visions kindled by the fire of restless minds. These ideas, born of rigorous principles and carefully woven methodologies, are united by a shared devotion: to conjure spaces that are thoughtful, creative, and alive; real-world sanctuaries sculpted for the stories of life.

Through these works, we offer our distilled approach: a path toward solutions that are not merely innovative, but deeply attuned to context, rooted in the rich soil of the learning environment. True innovation, we believe, is not a solitary flower; it flourishes in the fertile ground of collaboration, nourished by the ever-shifting realities of each project's place and people.

The learning journey undertaken guides emerging designers through a landscape of knowledge, studying echoes of the past, wandering through sites, and pondering the philosophical bedrock of design. This odyssey crescendos in the design studio, a crucible where vision is forged through iterative rituals of critique, deep analysis, and the alchemy of concept. Each step is a meditation on need, on society, on values, and on the singular character of space; yielding design resolutions that marry the poetry of constructability with the clarity of representation, rendered through a symphony of annotated drawings and models; each a testament to the power of thoughtful creation.

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

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III. Sustainable Development Goal (SDG)11: Make cities and human settlements inclusive, safe, resilient and sustainable.

IV. Africa Agenda 2063 goal 1: A high standard of living, quality of life and well-being for all citizens

A-Museums:

Museums play a vital role in the cultural, educational, and social fabric of cities. They are more than just repositories of art, history, and science; they are dynamic spaces that connect people to their past, enrich their present, and inspire their future. Here are some key reasons why museums are so important in urban settings:

PREFACE

DESIGN OBJECTIVES

1. Cultural Preservation and Education

Museums serve as guardians of a city's heritage. They preserve artifacts, artworks, and historical documents that reflect the unique stories of a community, region, or nation. By housing these items, museums help ensure that future generations can learn about and appreciate their history and cultural heritage. They are educational hubs where both locals and visitors can deepen their understanding of the world, gaining insights into diverse cultures, traditions, and historical events. This educational role is particularly important in cities, where people from various backgrounds come together.

2. Community Identity and Pride

Museums often act as symbols of a city's identity. Whether showcasing local art, historical landmarks, or the achievements of its people, museums reflect the collective spirit of a community. For residents, these institutions foster a sense of pride and connection to their city's past and present. Museums celebrate local achievements, commemorate significant events, and give communities a place to tell their own stories. This sense of ownership and pride can strengthen social cohesion and create a shared understanding of what makes a city unique.

3. Civic Engagement and Social Interaction

Museums are spaces where people can come together, exchange ideas, and engage in meaningful conversations. They are inclusive environments that encourage dialogue, reflection, and critical thinking. Exhibitions often address complex societal issues, which can spark conversations about culture, history, and identity. In this way, museums contribute to the ongoing civic discourse within a city, allowing individuals to explore topics that shape their community and the world at large.

4. Tourism and Economic Impact

Museums are significant drivers of tourism, attracting visitors both domestically and internationally. Iconic museums, such as the Louvre in Paris or the British Museum in London, have become major cultural landmarks that boost the economy of their cities. The influx of tourists visiting museums supports local businesses, including restaurants, hotels, and transport services. Additionally, museum events and exhibitions often generate revenue and provide jobs, contributing to the economic vitality of the urban area.

PREFACE

5. Inspiration and Creativity

Museums inspire creativity by showcasing works of art, science, and innovation. For artists, students, and creatives, museums are spaces of inspiration where they can encounter new ideas and reflect on the work of others. Many museums also host workshops, lectures, and performances that nurture creativity in the local community. In cities, where innovation and artistic expression are often at the forefront of urban culture, museums provide a platform for new ideas to flourish.

6. Accessibility and Inclusivity

In many cities, museums are open to all, offering a level of accessibility that allows people from different backgrounds, economic statuses, and abilities to experience cultural enrichment. Many museums offer free or reduced-price entry, making them accessible to a wide range of people. Additionally, many modern museums are increasingly committed to inclusivity, offering accessible exhibits for those with physical or cognitive disabilities and creating programs that serve diverse communities.

7. Preserving Natural History and Science

While art and history museums are essential, museums dedicated to natural history and science play an equally critical role. These institutions help explain the natural world, from the origins of life on Earth to the latest scientific discoveries. They educate the public about environmental issues, biodiversity, and the importance of sustainability—critical concerns in today's world. By providing interactive exhibits and hands-on experiences, science museums engage citizens of all ages, fostering a deeper understanding of science and nature.

8. Promoting Lifelong Learning

Museums encourage lifelong learning. They offer visitors the opportunity to explore new ideas, revisit old interests, and challenge their thinking. For children, museums provide hands-on learning experiences that complement traditional education. For adults, they offer a space for continued exploration and intellectual growth. Many museums also offer lectures, courses, and other educational programs that support personal development and lifelong curiosity.

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PREFACE

A.9 Fostering Global Understanding

In an increasingly globalized world, museums act as bridges between cultures. They allow people to engage with art, artifacts, and ideas from around the world, fostering cross-cultural understanding and empathy. For cities that are diverse or have international ties, museums can be a space for dialogue, helping to build connections between different cultural groups and promoting global awareness.

CONCLUSION:

In summary, museums are essential to the cultural, social, and economic life of cities. They preserve and share the stories of the past, offer educational opportunities, inspire creativity, and foster a sense of community. Museums also have an important role in promoting inclusivity, engaging with global issues, and boosting the local economy. In a city's bustling urban environment, museums provide spaces for reflection, learning, and connection—reminding us of the value of history, culture, and art in shaping the future

B-Public Library:

Public modern libraries are invaluable assets to cities, serving as vital community centers that foster learning, promote literacy, and enhance the overall well-being of urban populations. In an era where information is constantly evolving, these libraries are not just places to borrow books—they are dynamic spaces that offer diverse resources, services, and opportunities for personal and collective growth. Below are several key reasons why modern public libraries being essential in cities:

PREFACE

DESIGN OBJECTIVES

1. Access to Knowledge and Information

At their core, public libraries are gateways to knowledge. They provide free access to books, research materials, digital resources, and databases that might otherwise be inaccessible to many members of the community, particularly those from lower-income backgrounds. In cities, where socioeconomic disparities can be more pronounced, libraries ensure that everyone has an equal opportunity to learn and grow, regardless of their financial situation. Whether it's a student needing textbooks, an adult looking to improve their skills, or a senior citizen interested in reading the latest novels, libraries are the great equalizer, offering resources for all.

2. Promoting Literacy and Lifelong Learning

Modern libraries are crucial in promoting literacy, both for children and adults. They offer programs that support early childhood education, reading programs for all age groups, and adult education classes. In an increasingly knowledge-based economy, the importance of fostering literacy and critical thinking skills cannot be overstated. Libraries provide a supportive environment where individuals can access resources to improve their reading, writing, and analytical abilities. Furthermore, they promote lifelong learning by offering a variety of educational programs, workshops, and lectures, helping people of all ages continue to grow intellectually throughout their lives.

3. Community Engagement and Social Interaction

Libraries are often described as "third places"—spaces that are neither home nor work but where people can come together to engage with their community. In urban environments, where people often lead busy and isolated lives, libraries offer a welcoming, neutral space for social interaction. They host community events, book clubs, discussion groups, and cultural programs that allow individuals to connect, share ideas, and build relationships. These activities create a sense of belonging and cohesion in diverse urban populations, fostering a stronger, more engaged community.

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4. Digital Access and Technological Equity

As technology continues to advance, modern public libraries play a key role in bridging the digital divide. Many city residents may not have access to the internet, computers, or other technological tools at home, but libraries offer free access to these resources. Public libraries provide computer terminals, Wi-Fi, and digital literacy training, helping individuals develop essential technology skills. In a world where digital access is increasingly important for education, job opportunities, and communication, libraries are instrumental in ensuring that no one is left behind in the digital age.

5. Cultural Enrichment and Arts

Modern public libraries are not only places of reading but also cultural hubs that promote the arts and local culture. Many libraries host art exhibits, film screenings, live performances, author talks, and other cultural events that enrich the lives of city dwellers. Libraries also provide access to a wide range of multimedia resources—movies, music, audiobooks, and digital art—offering diverse forms of cultural expression. For cities with diverse populations, libraries can serve as platforms for showcasing the richness of different cultures and fostering mutual respect and understanding.

6. Supporting Research and Academic Growth

Libraries are indispensable resources for academic and professional development. For students, researchers, and professionals, public libraries provide access to a vast range of academic journals, reference materials, and research databases that may not be available elsewhere. They also offer study spaces, quiet areas for focused work, and meeting rooms for group collaborations. In cities with universities, research institutions, and a thriving workforce, libraries become essential partners in academic success and career advancement.

7. Providing Resources for Job Seekers and Career Development

Public libraries increasingly serve as job resource centers, providing services like resume writing assistance, job search support, interview coaching, and access to job boards. Many libraries also host career workshops, provide access to specialized software for professional development, and offer training in high-demand skills such as coding, graphic design, or digital marketing. In cities with competitive job markets, libraries provide critical support to individuals looking to improve their employment prospects, helping them navigate the complexities of the modern job market.

PREFACE

8. A Safe and Inclusive Space

Libraries are one of the few public spaces that are open to everyone, regardless of background, age, race, or social status. They provide a neutral, non-judgmental environment where people can feel safe and welcomed. In urban areas with diverse populations, libraries act as inclusive spaces that support all community members, including marginalized groups, immigrants, and refugees. They also offer services for individuals with disabilities, creating an accessible environment for all. Libraries can be sanctuaries for those who may not have other places to go, providing a sense of comfort and security.

9. Environmental Sustainability and Green Spaces

Many modern public libraries are designed with sustainability in mind, incorporating green building practices and energy-efficient technologies. Libraries can also serve as centers for promoting environmental awareness, hosting events and educational programs on sustainability, conservation, and climate change. In cities where access to green spaces can be limited, libraries with outdoor areas or green roofs provide much-needed places for relaxation, reflection, and environmental education. These libraries contribute to the overall well-being of the city and its residents, making the urban environment more liveable and sustainable.

10. Fostering Civic Engagement and Democracy

Libraries play a crucial role in promoting civic engagement and supporting democratic values. They offer programs that teach people about their rights and responsibilities as citizens, provide access to legal resources, and host discussions on important social and political issues. In cities where diverse populations may not always have equal access to political information or public services, libraries act as vital hubs for democratic participation, encouraging informed decision-making and active involvement in civic life.

Conclusion:

Public modern libraries in cities are far more than just places to borrow books—they are dynamic, multifaceted community centers that provide essential services and resources to a wide range of people. From promoting literacy and lifelong learning to offering access to technology and supporting job seekers, libraries are crucial to the intellectual, social, and economic development of urban areas. They foster community engagement, cultural enrichment, and inclusivity, while also serving as safe spaces for reflection, creativity, and personal growth. In short, modern public libraries are pillars of urban life, making cities more vibrant, connected, and equitable for all.

PREFACE

C- Exhibition Hall:

Exhibition halls play a critical role in the cultural, economic, and social life of cities. These spaces are not only venues for showcasing art, innovation, and industry but also serve as catalysts for community engagement, education, and economic development. Whether they host art exhibitions, trade shows, conventions, or cultural festivals, exhibition halls are key components of a city's infrastructure, contributing to its vibrancy, creativity, and global connectivity. Here are several reasons why exhibition halls are so important in urban environments:

DESIGN OBJECTIVES

1. Cultural and Artistic Expression

Exhibition halls are central to the arts and culture scene in cities. They provide a platform for artists, designers, and creators to showcase their work, whether it be visual art, sculpture, photography, or multimedia installations. By hosting exhibitions, these venues give the public access to new ideas, perspectives, and forms of creative expression. They contribute to the cultural richness of a city, drawing in local, national, and international visitors who are eager to experience new artistic trends and cultural movements. Cities with thriving exhibition halls often become cultural hubs, attracting art collectors, curators, critics, and tourists. These spaces also foster collaborations between artists, curators, and cultural institutions, helping to elevate the city's cultural profile on a global scale. Furthermore, exhibition halls often serve as venues for public art projects, community-based exhibitions, and educational programs that engage diverse audiences and promote cultural dialogue.

2. Economic Impact and Tourism

Exhibition halls are significant drivers of the local economy. Large-scale exhibitions, conventions, trade shows, and expos often attract thousands of attendees, including professionals, exhibitors, and tourists from around the world. This influx of visitors generates revenue for local businesses, including hotels, restaurants, transportation services, and retail outlets. The economic impact of these events can be substantial, with many cities investing in exhibition halls as long-term infrastructure projects designed to boost their economies. In addition to the immediate economic benefits, exhibition halls can enhance a city's reputation as a destination for business and leisure travel. Events like international trade shows, product launches, and industry conferences can position a city as a global center for specific sectors, whether it be technology, fashion, design, or the arts. Over time, this can lead to increased investment, tourism, and job creation, making exhibition halls an important pillar of a city's economic development strategy.

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3. Platform for Innovation and Knowledge Sharing

Exhibition halls are not only about showcasing art and culture but also serve as venues for sharing knowledge, innovation, and new ideas. Trade shows and conventions are spaces where industries come together to display the latest technologies, products, and services. Whether it's a tech expo, a healthcare conference, or a green energy exhibition, these events foster the exchange of ideas, stimulate creativity, and promote professional networking. They help businesses stay up to date with the latest trends and innovations in their fields, providing valuable opportunities for collaboration, investment, and growth. Moreover, exhibition halls often host educational programs, workshops, and panel discussions that encourage learning and skill development. By bringing together experts, thought leaders, and entrepreneurs, these spaces create an environment conducive to knowledge sharing and the advancement of new solutions to global challenges.

4. Community Engagement and Social Interaction

Exhibition halls serve as community gathering spaces where people from diverse backgrounds and interests can come together. Whether it's a local art exhibition, a cultural festival, or a public event, these venues provide opportunities for social interaction, dialogue, and collective experiences. They foster a sense of community by encouraging people to explore shared interests, celebrate common values, and learn from each other. For cities with diverse populations, exhibition halls can act as platforms for cultural exchange, allowing different communities to share their stories, traditions, and artistic expressions. This promotes greater social inclusion and understanding, while also enriching the city's cultural fabric. In this way, exhibition halls can contribute to social cohesion and help build stronger, more interconnected communities.

5. Supporting Local Artists and Creators

Exhibition halls are vital spaces for the promotion of local artists, creators, and entrepreneurs. These venues provide a stage for emerging talent to showcase their work, gain exposure, and connect with potential buyers, collectors, and collaborators. Many exhibition halls host dedicated spaces for local artists, crafts persons, and designers, helping them reach broader audiences and gain recognition within their fields. By hosting exhibitions that focus on local art, heritage, and craftsmanship, these venues help preserve and celebrate a city's unique cultural identity. They provide opportunities for local artists to engage with global trends while staying rooted in their communities. Additionally, exhibition halls often partner with schools, universities, and cultural organizations to offer mentorship programs, workshops, and educational initiatives that support the growth of the local creative economy.

PREFACE

6. Education and Cultural Literacy

Exhibition halls are important educational resources, providing opportunities for people of all ages to learn about art, history, science, and culture in an interactive and immersive way. They often feature exhibits that are designed to educate visitors on a wide range of topics, from historical events and social issues to technological advancements and scientific discoveries. These exhibitions make learning engaging and accessible, often incorporating multimedia, interactive displays, and hands-on activities that cater to diverse learning styles. Many exhibition halls also host educational programs for schools, families, and individuals, offering workshops, guided tours, and lectures that deepen visitors' understanding of the subjects on display. For children, in particular, these spaces can spark curiosity, creativity, and critical thinking, helping to cultivate a lifelong love of learning.

7. Architectural and Urban Development

Exhibition halls can also have a significant impact on the physical and architectural landscape of a city. Well-designed exhibition venues often become iconic landmarks, contributing to the city's aesthetic appeal and architectural heritage. They may be housed in innovative, cutting-edge buildings that attract attention and serve as architectural showcases in their own right. In addition, the development of exhibition halls can spur urban regeneration and revitalization. By creating attractive, functional spaces for cultural and business events, cities can revitalize neglected or underutilized areas, attracting investment, improving infrastructure, and enhancing the overall quality of life for residents. Exhibition halls, particularly when integrated into mixed-use developments, can help create vibrant urban districts that combine culture, commerce, and public spaces.

8. Fostering Global Connectivity

Exhibition halls are essential for fostering global connectivity and international collaboration. Many large-scale exhibitions, such as world expos or international trade fairs, bring together countries, industries, and professionals from across the globe. These events provide platforms for showcasing global innovations, discussing international issues, and exploring cross-cultural connections. For cities, hosting international exhibitions and events enhances their global profile and strengthens diplomatic, trade, and cultural ties. It allows local industries to gain exposure on the world stage while attracting foreign investment and partnerships. In this way, exhibition halls contribute to a city's position as a global player, helping to promote international exchange and understanding.

PREFACE

CONCLUSION

Exhibition halls are indispensable to the cultural, economic, and social fabric of cities. They are more than just spaces for displaying art and products—they are dynamic, multifaceted venues that contribute to the growth and development of urban areas. By providing platforms for cultural expression, innovation, education, and community engagement, exhibition halls enrich the lives of city residents and visitors alike. They also stimulate economic activity, attract tourism, and promote global connectivity, helping cities thrive in an increasingly interconnected world. Whether hosting a local art exhibition or a major international conference, exhibition halls are vital to the continued vibrancy and progress of cities.

CHAPTER TWO

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 (DAID)

TOPICAL CUE

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

Site Analysis

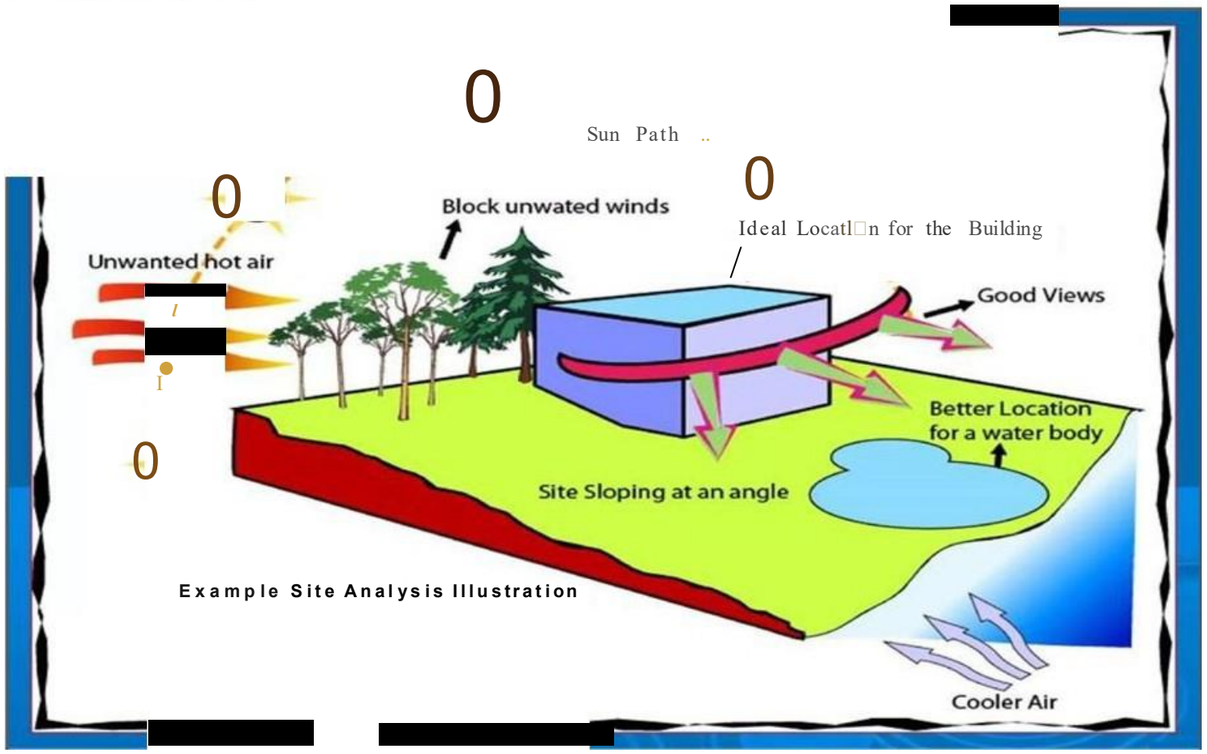


Image source: (Sabeer Hamid, 2018)

Goals of Site Analysis

- ToAchieve 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 theclients needs & aim.
- Gathering relevant information about thesite.
- 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.....

R Accessibility

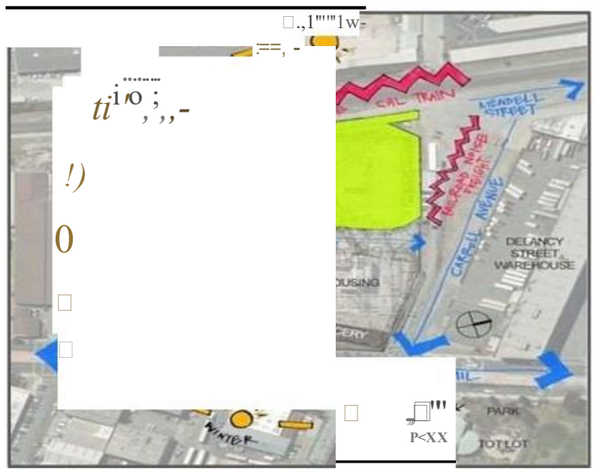


Image source: (Sabeer Hamid, 2018)

C. Sile Sut[OUPdiug

District Character
LandMarks
Building heights

D. Surrouudinr Activities

Architectural Style
Attraction Buildings /point
Nodes

Site Surrounding Context

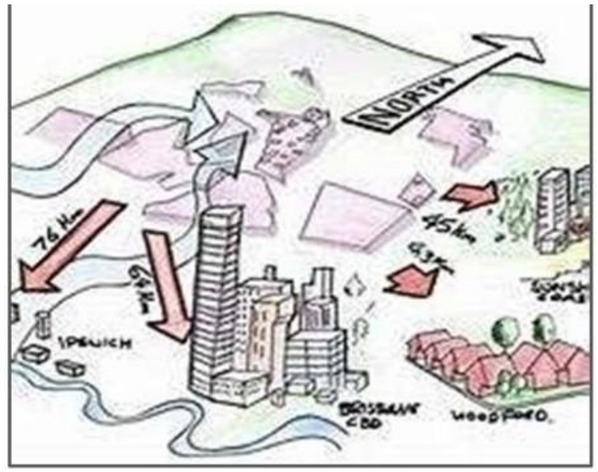


Image source: (Sabeer Hamid, 2018)

E. **JJ!ilities**

Sanitary
Water Supply
Electrical
Gas

F, **Site Beru Jation**

Setback
Height

Am!

Analysis
Discussions
Decisions

AW

- ToAttract and compete in the Global market.
- This require a good, updated, Contemporary, well equipped Design.
- Tomatch 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...

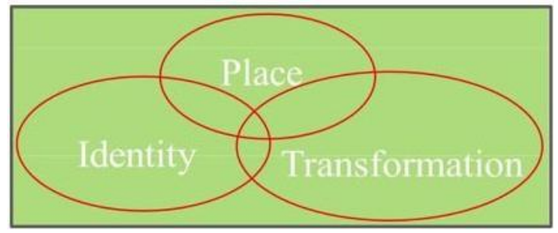


Image source: (Sabeer Hamid, 2018)

Main Asoects of Design

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

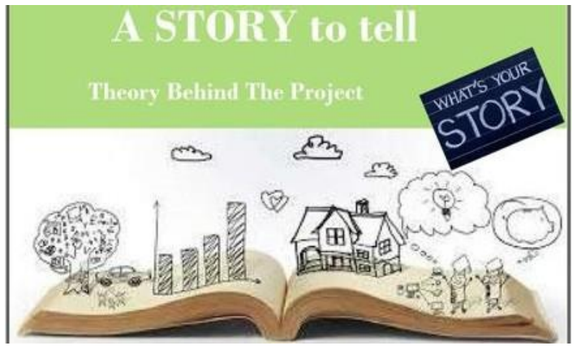


Image source: (Sabeer Hamid, 2018)

PROPOSED SITE LOCATIONS

The proposed location pins:
Westlands
https://maps.app.goo.gl/1qqD7hrEgoGgJbAO6

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

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

KONZA CITY – GROUP 1 PERSPECTIVES

KONZA CITY

SITE ANALYSIS

Group 1

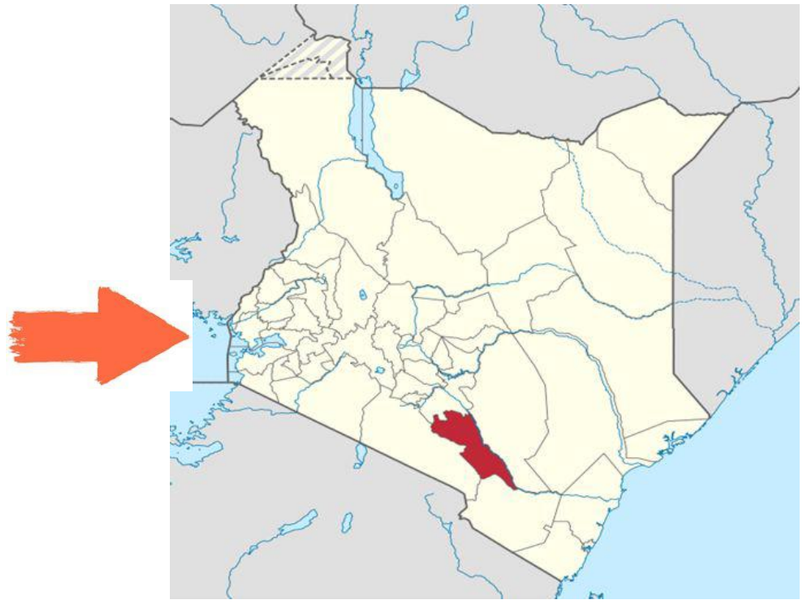
https://www.businessdailyafrica.com/bd/news/counties/investors-take-80pc-of-konza-land-3862956

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2024/2025

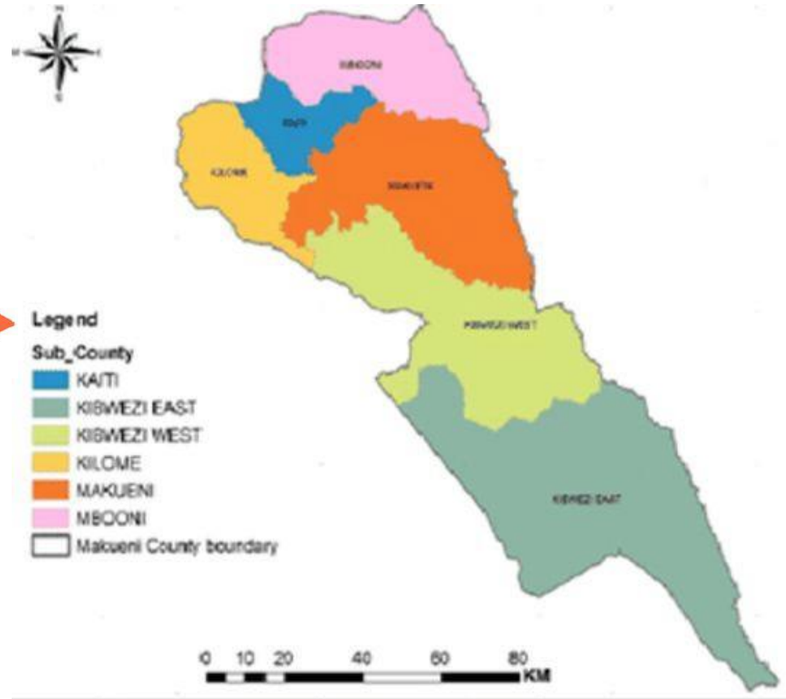
1. Benard Wakarindi
2. Brenda Abach
3. Brian Ndung'u
4. Evans Kibet
5. Grace Kavata
6. Harith Mohamed
7. Lilian Gatheca
8. Mwangi Kahuko
9. Nick Marete
10. Sulayman Kimutai
11. Tabitha Maina
12. Victor Kimani

LOCATION

AFRICA



KENYA



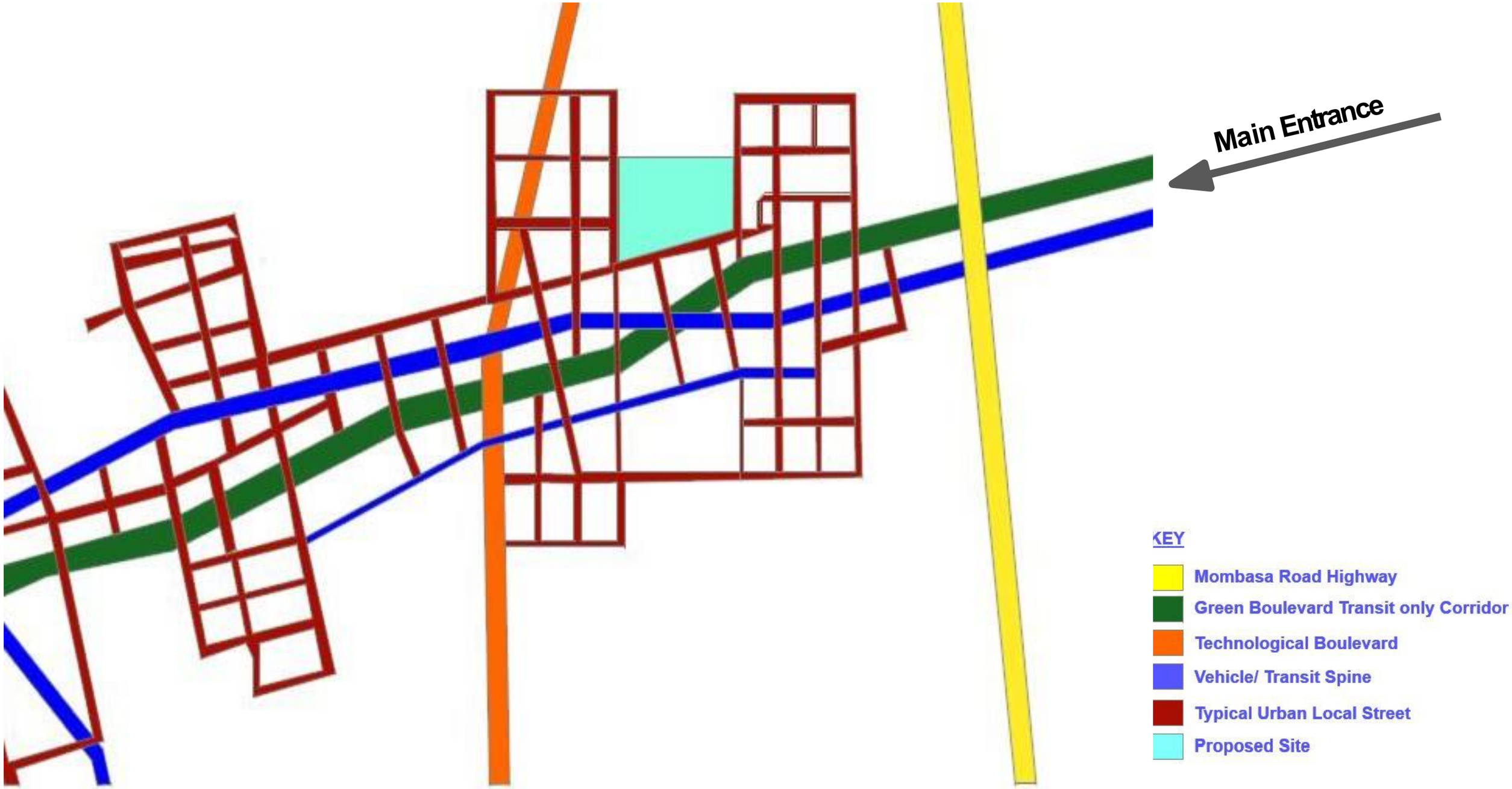
MAKUENI COUNTY

PROPOSED SITE

KONZA TECHNOPOLIS

Google Earth. (n.d.). [Location map of Konza Technopolis, Kenya]. Retrieved January 28, 2025, from https://earth.google.com

SITE LAYOUT



Kenya Engineer. (n.d.). Creating sustainable streets and transport systems. Kenya Engineer. Retrieved January 30, 2025, from https://www.kenyaengineer.co.ke/creating-sustainable-streets-and-transport-systems/

ACCESS

Main Entrance

Hao Finder. (n.d.). *Konza Technopolis: Kenya's premier smart city & special economic zone.* Retrieved January 28, 2025, from https://www.haofinder.com/blog/konza-technopolis-kenyas-premier-smart-city-special-economic-zone

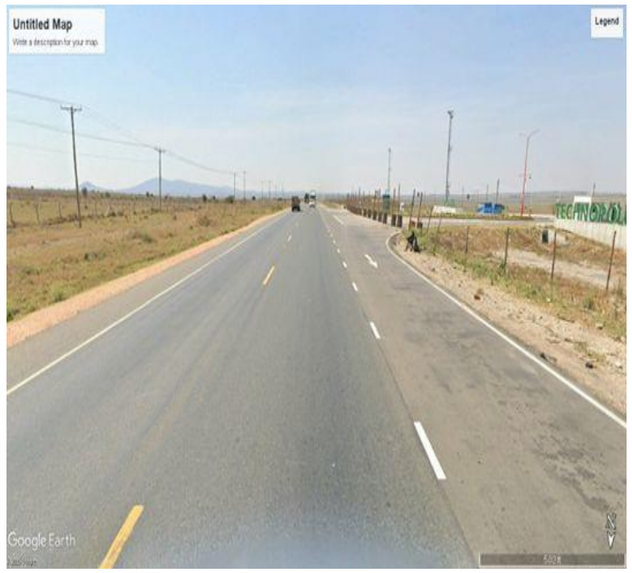
•The entrance features a sleek, cutting-edge design to reflect the innovation and technology focus of the city.

•The entrance has multiple access points with controlled gates for vehicles and pedestrians.

•The entrance connects seamlessly to the surrounding infrastructure, with well-paved roads and marked lanes.

•Designed to handle both small and large vehicle traffic efficiently.

Mombasa Road



Google Earth. (n.d.). [Location map of Konza Technopolis, Kenya]. Retrieved January 28, 2025, from https://earth.google.com

Interior Roads

Hao Finder. (n.d.). *Konza Technopolis: Kenya's premier smart city & special economic zone.* Retrieved January 28, 2025, from https://www.haofinder.com/blog/konza-technopolis-kenyas-premier-smart-city-special-economic-zone

•It is a major highway that connects Nairobi to Mombasa

•It is a dual carriageway for most of its stretch

• A 109 is projected to ultimately become a limited access divided highway and accommodate 4-6 lanes of vehicular traffic and one dedicated Bus Rapid Transit (BRT) lane in each direction.

•New roadway construction in Konza Technopolis will include a hierarchy of streets: **arterial** and c**ollector roadways**, **local level roads**, and several "**green streets**"

•It intends to incorporate the following road types:

1. **Auto Boulevard (4 Lane)** – This 40m roadway section includes 2 mixed vehicle/transit travel lanes in each direction and 2.5m bike or parking lane with an 8m median with a left turn lane, a 2m landscape zone and 2m pedestrian walkways on both sides of the road.

2. **Technology Boulevard (6 Lane)** – This 40m boulevard section accommodates 1 bus lane and 2 mixed vehicle/transit travel lanes in each direction with an 8m vegetated median with a left turn lane, a 2m landscape zone with 3.5m pedestrian walkways on both sides of the boulevard.

3. **Typical Urban Local Street (2 Lane)** – This 20m roadway section includes 1 vehicular travel lane in each direction with a 2.5m parking/bike lanes, a 2m landscape zone and 2m pedestrian walkways on both sides of the street.

4. **Green Transit Corridor** – This 60m roadway section is a bus-only roadway with a 35m vegetated central median with a 4m bike lane located between the bus travel lanes. This section includes a 4m pedestrian walkway separated from the road by a 2m landscape area/tree lawn on one side or a 3m vendor zone with a 3m pedestrian walkway.

ACCESS RECOMMENDATIONS

1. Road and Vehicular Access

- **Integration with Existing Roads**: Ensure the museum connects seamlessly with the Konza Technopolis primary and secondary road networks.
- **Drop-Off/Pick-Up Zones**: Designate areas for buses, ride-shares, and private vehicles near the entrance for ease of access.
- **Parking Facilities**:
  - Allocate ample space for parking, including zones for cars, buses, and bicycles.
  - Include electric vehicle charging stations to align with the smart city concept.

https://www.yahoo.com/news/may-rude-illegal-gas-cars-100000155.html

- **Traffic Flow Management**
  - Implement clear signage for entry and exit points.

2. Public Transportation

- **Integration with Public Transport Hubs**:Ensure the site is accessible via planned bus routes or future light rail stations within Konza.
- **Shuttle Services**: Offer shuttles from key transport hubs within Konza or nearby cities like Nairobi and Machakos.
- **Dedicated Drop-Off Areas**: Ensure sufficient space for buses and public transport vehicles to safely unload passengers.

3. Pedestrian Accessibility

- **Safe Walkways**: Include wide, well-lit pedestrian pathways leading to and around the museum.
- **Crosswalks and Safety**: Install zebra crossings and traffic-calming measures near entrances.
- **Connectivity to Nearby Attractions**: Link the museum to other parts of Konza Technopolis via pedestrian-friendly routes.

4. Universal Accessibility

- **Wheelchair Access**:
  - Incorporate ramps and elevators with gentle slopes and accessible entry points.
  - Ensure all parking areas have designated spaces for persons with disabilities.
- **Braille and Tactile Signage**: Add these at entry points, pathways, and exhibits.
- **Hearing and Visual Assistance**:
  - Provide hearing loops and assistive listening devices.
  - Use high-contrast signage for easy readability.
- **Rest Areas**: Place benches or shaded seating areas along pathways.

https://jbolivar-75388.medium.com/

5. Emergency and Service Access

- **Emergency Vehicle Access**:Designate clear, unobstructed routes for fire trucks, ambulances, and other emergency vehicles.
- **Service Entrances**: Separate service and staff entry points from public areas to streamline operations without disrupting visitor access.

6. Digital Navigation

- **Wayfinding Systems**
  - Provide digital kiosks and interactive maps at strategic points.
  - Use QR codes for mobile navigation and exhibit information.
- **Smart City Integration:** Collaborate with Konza Technopolis authorities to integrate the museum into the city's mobile app or GPS systems.

7. Environmental and Aesthetic Considerations

- **Landscaping and Green Pathways**:Create shaded green walkways to encourage walking and enhance the site's aesthetics.
- **Eco-Friendly Transport**: Provide facilities for bicycles and scooters, promoting non-motorized transport within the museum's vicinity.

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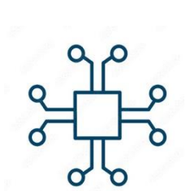
KONZA TECHNOPOLIS

- Konza (Konza Technopolis) is a key flagship project of Kenya's Vision 2030 economic development portfolio.
- Konza will be a world-class city, powered by a **thriving information, communications and technology (ICT) sector, superior reliable infrastructure and business friendly governance systems.**

MAJOR CLUSTERS



ICT

ENGINEERING

IMPLEMENTATION.

The Master Plan of Konza Technopolis has seen the development begin on Phase 1 (est. completion 2022)

Expected occupancy: 30,000 Residents

Facilities to be provided

Housing: 12,960 units
Approx. Gross Built Area 1,028,000 sqm.

Commercial spaces: 725,000 sqm.

University: 343,458 sqm.

Healthcare: 59,500 sqm.

Light Industrial Zone: 10,300 sqm.

Retail: 172,200 sqm.

Hotel and convention centres: 75,200 sqm.

Energy: A solar power plant on 121,406 sqm

Entertainment: 73,800 sqm

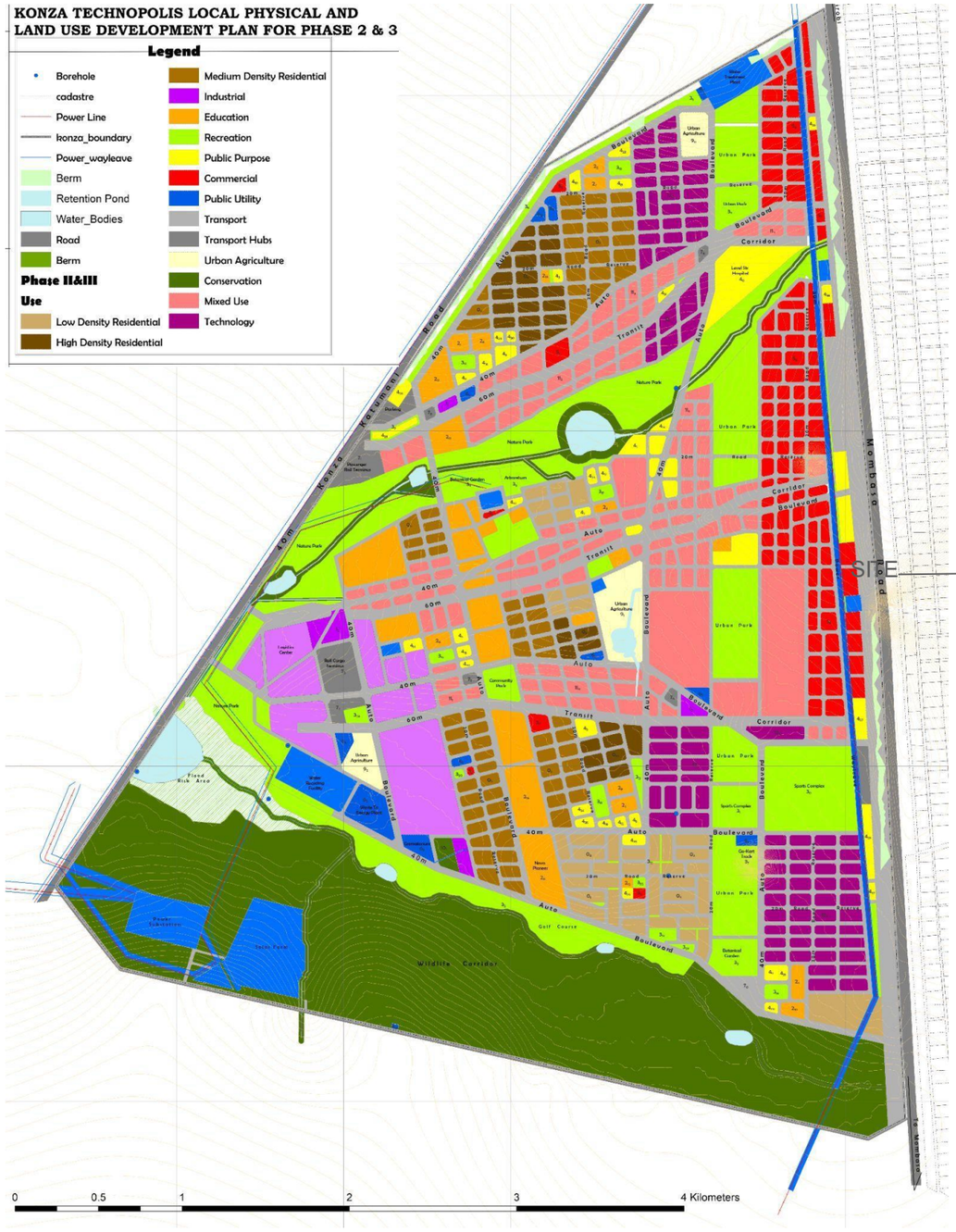
Transport & Logistics:
Parking Structures/Commercial/Petrol Complex, Fueling Station, Warehouse, Hybrid Buses, Bus Rapid Transit, Regional Transit Buses/Trains, Maintenance Storage Facility, Internal transit system, Mixed-use Parking, Transit Hub and Regional airport

UNIVERSITY ZONE |https://konza.go.ke/

COMMERCIAL ZONE |https://konza.go.ke/

TECHNOLOGICAL HUB |https://konza.go.ke/

SITE NEIGHBORHOOD

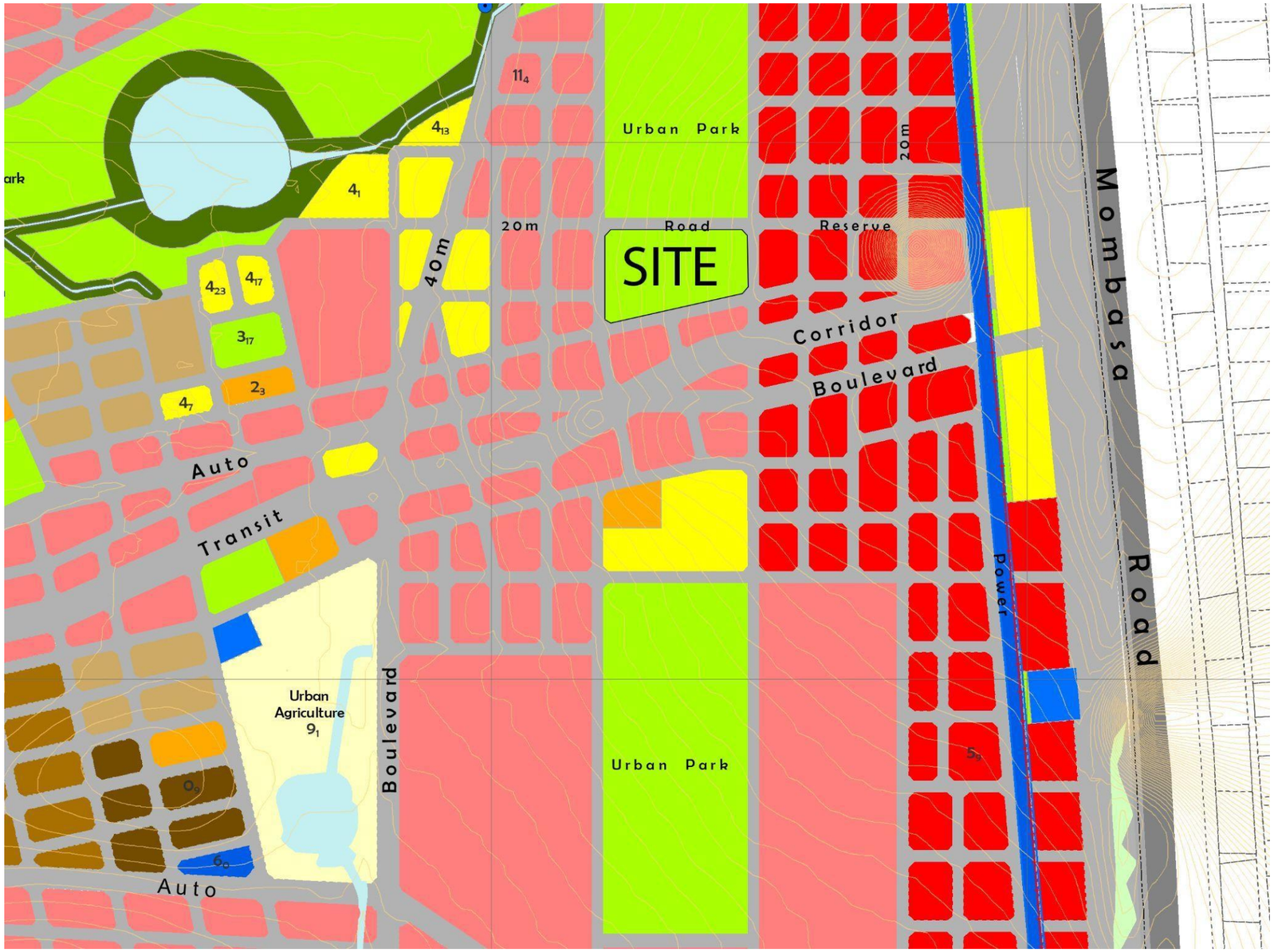


https://www.scribd.com/document/425435360/VILLA-EL-SALVADOR-ZONIFICACION-ACTUALIZADO-pdf

PHYSICAL MODEL OF KONZA TECHNOPOLIS SOURCED FROM |https://maps.app.goo.gl/fxMwnsmVi4kVg9WY9?g_st=ac

KONZA PICTORIALS ADAPTED FROM OFFICIAL WEBSITE |https://konza.go.ke/

SITE NEIGHBORHOOD



- Borehole
- cadastre
- Power Line
- konza_boundary
- Power_wayleave
- Berm
- Retention Pond
- Water_Bodies
- Road
- Berm

Phase II&III

Use

- Low Density Residential
- High Density Residential
- Medium Density Residential
- Industrial
- Education
- Recreation
- Public Purpose
- Commercial
- Public Utility
- Transport
- Transport Hubs
- Urban Agriculture
- Conservation
- Mixed Use
- Technology

https://www.scribd.com/document/425435360/VILLA-EL-SALVADOR-ZONIFICACION-ACTUALIZADO-pdf

NEIGHBORHOOD CHARACTER

KONZA TECHNOPOLIS

The building in the image appears to exhibit elements of Modernism with a touch of Postmodernism.

- **Clean lines and geometric forms:** The building has a strong emphasis on simple, rectilinear shapes and a lack of ornamentation.
- **Large expanses of glass**: The use of glass curtain walls allows for ample natural light and creates a sense of openness.Green roofs, solar panels, and passive cooling (reducing energy demand).
- **Functionalism**: The design prioritizes functionality and efficiency, with a focus on clear circulation paths and open floor plans.
- **Playful elements:** The inclusion of a central courtyard and the use of different materials (glass, concrete, metal) add visual interest and break the monotony of the modernist aesthetic.

BOMI OFFICES

- The **cantilevered upper volume** dominates the design, creating a striking visual effect.
- The **angular geometry** gives the building a sharp, futuristic aesthetic.
- **Open ground floor design** provides a public interface, allowing for accessibility and interaction.
- The **exterior cladding** are **composite panels**, reinforcing the industrial, high-tech aesthetic.
- The **large glass railing on the cantilevered section** enhances openness and provides an unobstructed view, adding to the futuristic appeal.
- **Glass integration allows for natural light**, but the use of high-performance glazing would be essential to control thermal efficiency.
- **Sharp lines** give the building a modern lookSharp lines in contribute to a modern look by emphasizing clean geometry, minimalism, and precision

KONZA DATA CENTRE

- **Facade Material**: The use of composite panels defines the facade, providing a sleek and uniform appearance.
- **Geometric Simplicity**: The building's design is defined by rectangular and box-like shapes, reflecting the modernist principle of "form follows function."
- **Monolithic Massing:** The structure is monolithic, with a heavy, grounded presence created by the large, unbroken planes of the facade.
- **Grid-Like Panel Arrangement:** The facade is divided into a visible grid formed by the seams of the composite panels.
- **Neutral Color Palette:** The gray tones of the composite panels
- **Functional Security Features:** The perimeter is secured with a tall metal fence supported by masonry posts.
- **Lack of Ornamentation:** The absence of traditional architectural embellishments (e.g., cornices, arches) directs attention to its structural materials and geometry.

SPORTS FIELD

- **Football Field:** The synthetic turf or grass surface ensures durability and consistent performance
- **Running Track:** The oval running track surrounding the field suggests a multi-purpose facility supporting both football and track-and-field sports.
- **Floodlights:** The presence of tall floodlight towers
- **Peripheral Design:** The absence of spectator stands implies the field is primarily designed for training, recreational use,
- **Purpose and Context**: The new soccer field in Konza City is designed to host major sports events, nurture young talent, boost local tourism and the economy, and serve as a modern, accessible sports hub. It supports both community development and Kenya's goal of becoming a regional sports destination.

Source of all images-https://x.com/konzatech/status/1937530843204899057

UTILITIES

Water Supply and sanitation

The water supply is from:

•boreholes drilled on-site,

•a pipeline connection to the Nol-Turesh water supply, and

•water from the Thwake Dam once fully operational;

There is water treatment plant within the site.

Located at the highest point of Konza to facilitate gravity-fed distribution

Water treatment system at Konza
Konza Technopolis, 2024

The sanitation system includes a wastewater collection, sewer lines and treatment infrastructure. The storm sewer system includes a series of drainage inlets, manholes, and piping

Treated wastewater can be used for irrigation and cooling purposes.

Sanitation system at Konza. Google Maps, 2025

Sustainability focus: water conservation measures like rainwater harvesting and efficient plumbing systems within the buildings.

<u>Response</u>

Rainwater harvesting and water efficiency by the plumbing fixtures.

Lighting & Security

nza Technopolis in Kenya has a security command center, police station, fire station, and other security infrastructure.

CCTVs and Street Lights at Konza
Kenyans.co.ke, 2023

Technopolis has a security barrier and entrance feature.

Konza City Technopolis has erected smart poles that have CCTV cameras, smart lighting, digital signage, environmental sensors, a public address system, and a help button

Signages and Traffic Lights at Konza
Kenyans.co.ke, 2023

UTILITIES

Electricity supply

- Electricity supply is through a 132kV substation located within the site connected to the national grid.
- It provides a reliable power supply to the tech city.

KETRACO Konza Substation. Google Maps, 2023

- Drawing from a mix of hydro, geothermal, and thermal power sources.
- Plans are in place to incorporate on-site solar power generation to enhance sustainability.

Response:

- Incorporate solar energy and energy efficiency in the design

Solar panels at Konza Complex
Konza Technopolis, 2023

Internet

- Konza Technopolis offers readily available Wi-Fi access throughout the site, marketed as "NextGen Wi-Fi 6".

It has access points strategically placed on streetlights and buildings.

Allows for high-speed internet connectivity within the site.

This is facilitated through the Konza National Data Centre which manages the network infrastructure.

The Data Centre at Konza
Konza Technopolis, 2024

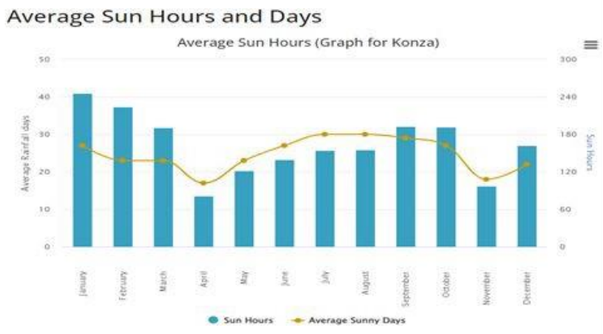
CLIMATE ANALYSIS

•Konza Technopolis in Kenya has a semi-arid savanna climate.

•It's generally sunny, dry and temperate most of the year in Kenya despite being situated directly on the equator.

1) SUN

•Sun path is East-West

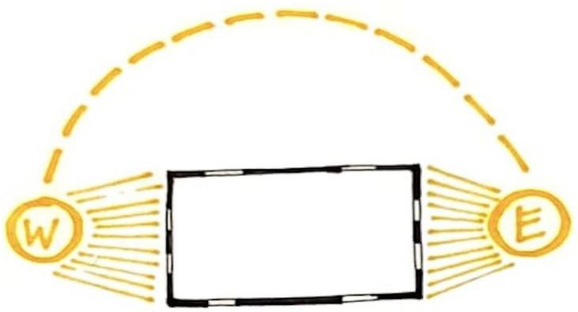


Graph showing average sun hours and days (Source:https://weatherspark.com/y/100131/Average-Weather-in-Konza-Kenya-Year-Round#google_vignette)

Design Strategies and responses

a) Building orientation

•Orient buildings along the east-west axis to minimize exposure to direct solar radiation on the longer facades.



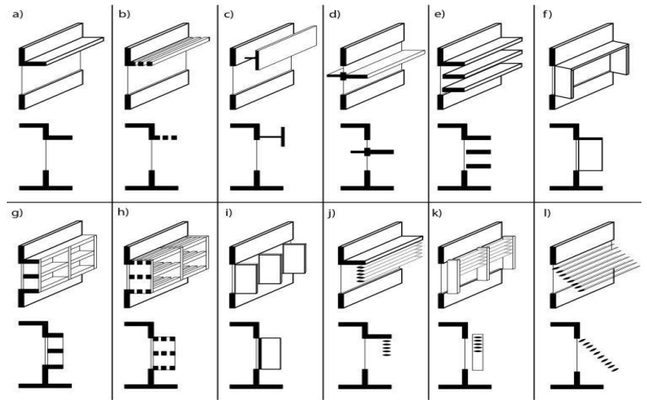
N-S Orientation; Source: whereistheorth.com

b) Shading strategies

•Plant deciduous trees to provide shade in hot months and allow sunlight during cooler periods.

•Employ external shading devices such as screens, cladding and balconies.

(Sun Path & Wind Direction: Source: Konza.go.ke; Edited in Archicad, 2025)



(Various sun shading techniques; Source: Science Direct.com)

c) Glazing and fenestration

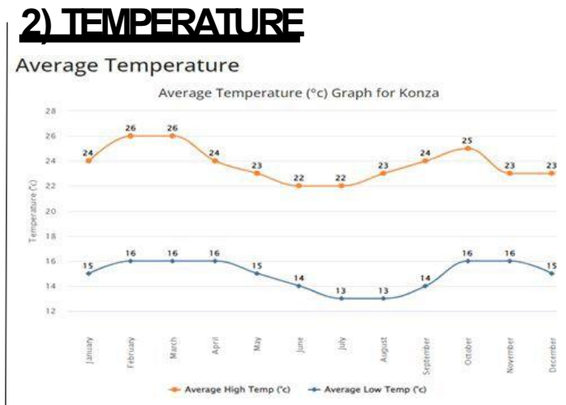
•Limit large glass openings on the facades, where heat gain is highest.

•Use high-performance glazing, such as low-emissivity (low-E) glass, to minimize heat transmission.

d) Incorporating solar panels

Solar panels on the Konza Conference Center; Source: Nation Media, (2024)

2) TEMPERATURE



Graph showing average monthly temperatures; Source: (https://weatherspark.com/y/100131/Average-Weather-in-Konza-Kenya-Year-Round#google_vignette)

•The hottest month is March, with an average high of 27.2°C and low of 15.6°C

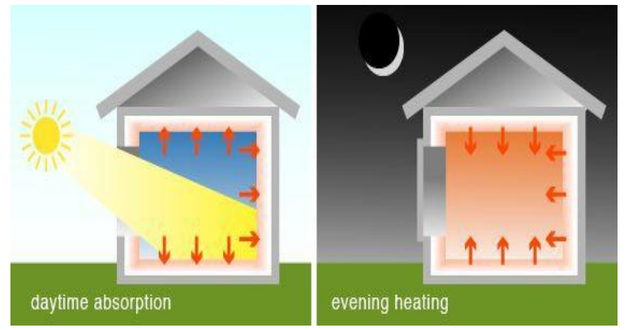
•The cool season lasts for 2.7 months, from June 5 to August 27, with an average daily high temperature below 22.3°C

•The coldest month is July, with an average low of 13°C and high of 22.2°C.

Design Strategies and responses

a) Thermal massing

•Use high thermal mass materials (e.g., concrete, stone) to absorb heat during the day and release it at night



Thermal massing; Source:; greenspaec.co.uk (2025)

b) Passive cooling

•Utilize natural ventilation with large, operable windows to facilitate air movement

•Implement courtyards and atriums to creat cool microclimates within buildings.

c) Material selection

•Choose materials with high reflectivity and low heat conductivity.

(Reflective exterior wall finish/ employment of courtyard design on the Furnished apartments in Konza Technopolis; Source: Chams media, 2024)

d) Green roofs and walls

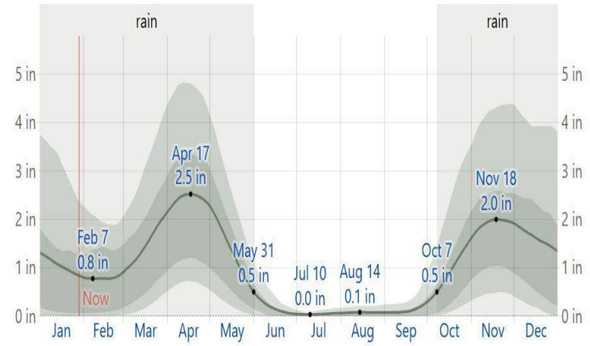
•Incorporate green roofs to reduce rooftop heat absorption.

•Use vertical gardens to provide insulation and cooling effects.

Green roofs in the 3D Model of the project; Source: Dolphin 254, (2024)

3) RAINFALL

- The rainy period of the year lasts for 8 months, from October to May , with a sliding 31-day rainfall of at least 0.5 inches.
- The month with the most rain in Konza is April, with an average rainfall of 2.5 inches.
- The rainless period of the year lasts for 4.months, from May to October .
- The month with the least rain in Konza is July, with an average rainfall of 0.0 inches.



Graph showing average monthly rainfall in Konza
Source:https://weatherspark.com/y/100131/Average-Weather-in-Konza-Kenya-Year-Round#google_vignette

Design Strategies and responses

a) Water surface runoff

- Use non- permeable surfaces for walkways which direct water to stormwater drains to be recycled
- balancing with softscape in case of flooding

https://x.com/konzatech/status/1937530843204899057

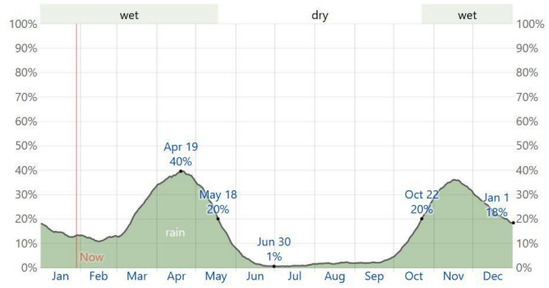
b) Roof design

- Use steep-sloped roofs or curved roofs to ensure quick runoff during heavy rains.
- Extend eaves and overhangs (1–1.5 meters) to protect walls and windows from direct rainfall.
- Incorporate gutter systems capable of handling heavy rainfall without overflow.

c) Elevate the building 0.5meter above the ground to reduce flood risks.
Consider flood-proof materials (e.g., concrete, stone, or treated wood) for lower walls and floors.

https://sejapleno.com/casas-elevadas-do-solo-solucao-funcional-e-estetica-em-7-projetos-brasileiros/

4) HUMIDITY



Graph showing Humidity Comfort Levels in Konza
Source:https://weatherspark.com/y/100131/Average-Weather-in-Konza-Kenya-Year-Round#google_vignette

a) Humidifying the air

- Use of open indoor ponds which evaporate water to humidify the air.

https://x.com/konzatech/status/1937530843204899057

5) WIND

- The predominant average hourly wind direction in Konza is from the east throughout the year.
- The windier part of the year is from August to April , with average wind speeds of more than 13.7km per hour.
- The windiest month of the year in Konza is October, with an average hourly wind speed of 16.4km per hour.
- The calmer time of year is from April to August. The calmest month of the year in Konza is June, with an average hourly wind speed of 10.9km per hour.

Design Strategies and responses

a) Design for cross ventilation

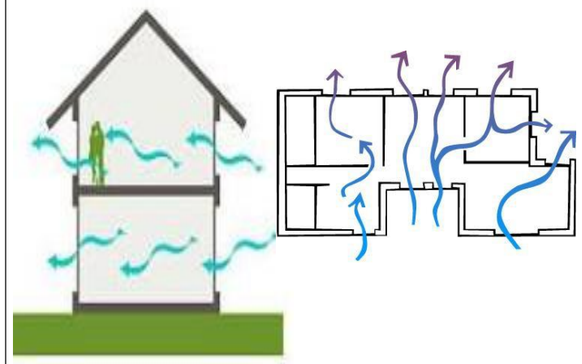


Image from indiansustainability.wordpress.com

b) Use adjacent structures to enhance airflow

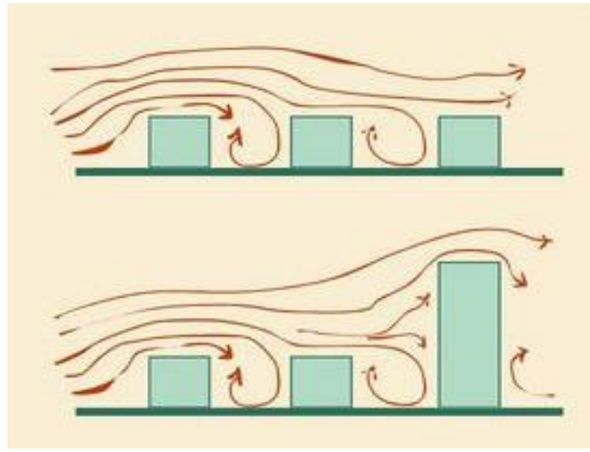


Image from quifstudio.com

c) Use vegetation to guide the wind

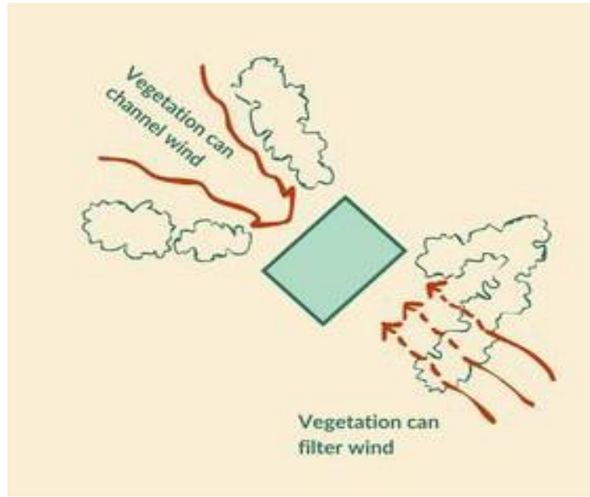


Image from quifstudio.com

VEGETATION

Sisal plant

Calligonum

https://www.businessdailyafrica.com/bd/news/counties/investors-take-80pc-of-konza-land-3862956

Flower of Zimbabwe

Red sandalwood

Source of images not indicated-https://x.com/konzatech/status/1937530843204899057

VEGETATION

- Konza city has allocated 1,200 acres for parks and green spaces.
- Konza Technopolis is located in a semi-arid region characterized by **sparse vegetation** dominated by hardy *acacia species*, *shrubs, and seasonal grasses.* The landscape is dotted with indigenous drought-resistant plants that have adapted to the local climate.
- The vegetation present within the site include:

Flora of Zimbabwe **Dipcadi longifolium**

Advantages

- Is prevalent throughout the site
- Is a drought-tolerant plant.
- It prefers well-drained soils.
- can be grown as an ornamental plant in gardens.

Disadvantages

- may become invasive and compete with native plants for resources

Responses

Preserve the grass in unconstructed parts for landscaping and prevention of erosion

Sisal Plant

- Is a drought tolerant plant
- Can be used as a synthetic material

Disadvantages

- have a relatively slow growth rate

Responses

The sisal plant is grown along the roads and pathways for landscaping. It should be preserved for prevention of soil erosion.

Red Sandalwood

The roads around Konza are lined with red sandalwood for the purposes of landscaping as well as prevention of soil erosion.

Calligonum

- Is a drought resistant plant
- Have deep roots that help in the prevention of soil erosion

Disadvantages

- Are slowly growing plants

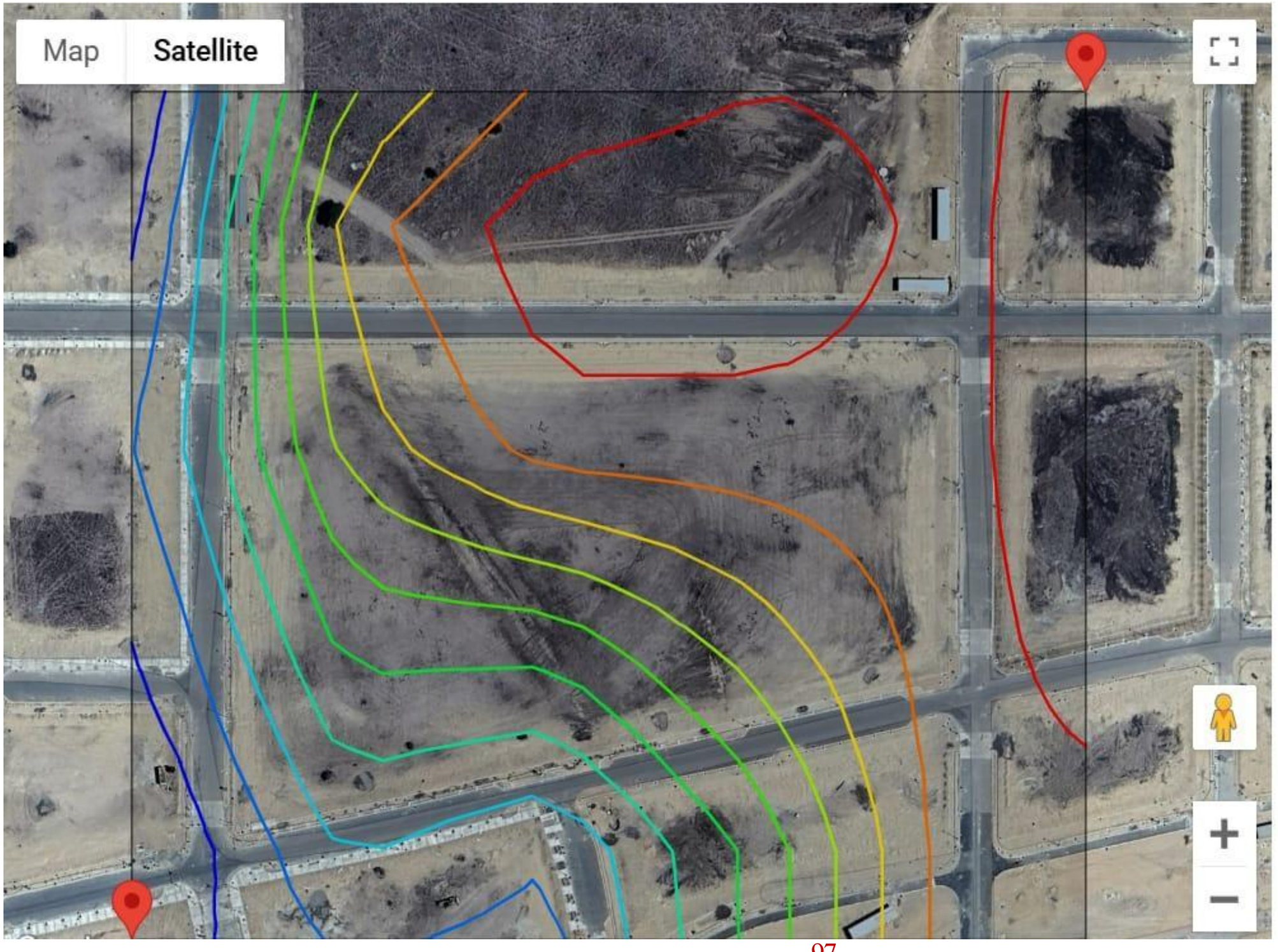
Responses

Preserve the plant in non constructed spaces for prevention of soil erosion and landscaping.

Sources of images-https://x.com/konzatech/status/1937530843204899057

SOIL AND TOPOGRAPHY

CONTOUR MAP

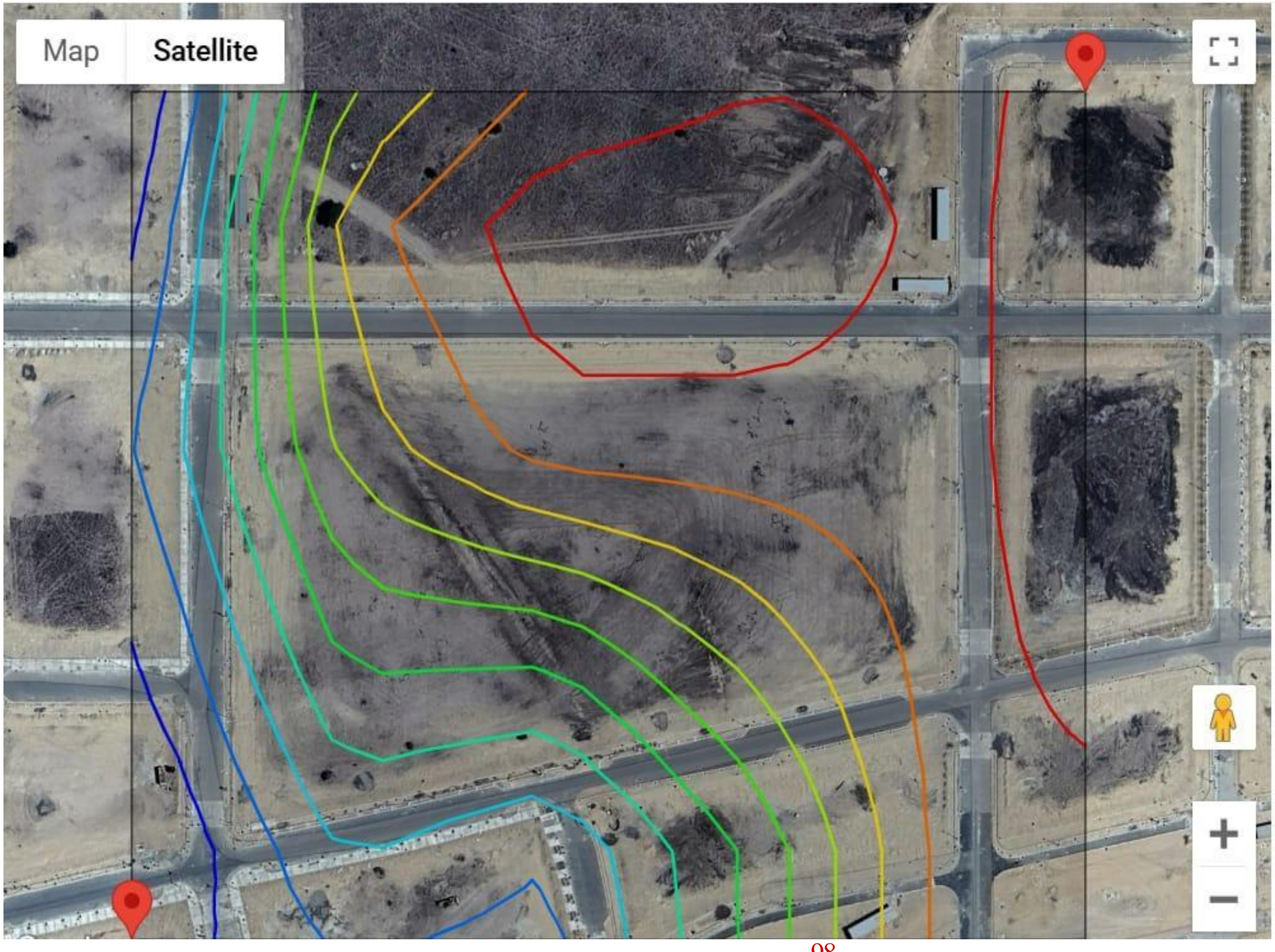


Slope and Topography:

- The contour lines on the map indicate a moderate to steep slope across the site. The close spacing of contours suggests areas of steeper gradients.
- The slope direction appears to be generally from northwest to southeast.
- Understanding the slope profile is crucial for determining building orientation, drainage solutions, and access routes.

SOIL AND TOPOGRAPHY

CONTOUR MAP



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https://forums.autodesk.com/t5/civil-3d-forum/creating-surface-dem-or-tin-w-dem-from-adf-file-dem-not-aligning/td-p/8516623

SOIL AND TOPOGRAPHY

https://forums.autodesk.com/t5/civil-3d-forum/creating-surface-dem-or-tin-w-dem-from-adf-file-dem-not-aligning/td-p/8516623

Drainage:

- The slope will impact surface water runoff. Proper drainage solutions are essential to prevent erosion, waterlogging, and potential damage to infrastructure.
- The analysis should identify potential drainage points and channels to direct water flow safely away from structures.

Sunlight and Shading:

- The slope orientation will determine the amount of sunlight received on different parts of the site throughout the day.
- Analyzing sun paths will help in optimizing building orientation for solar gain and shading strategies.

Views and Visual Connections:

- The slope provides opportunities for creating varying views and visual connections across the site.
- Identifying key viewpoints and potential visual obstructions will inform the placement of buildings and landscape elements.

Library:

- **Slope Integration**:

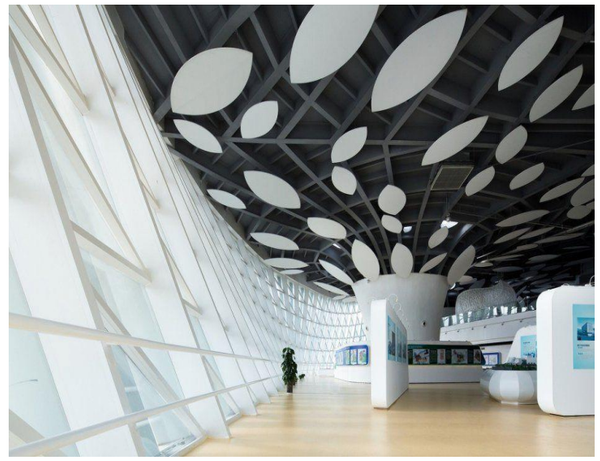
  The varying elevations could be used to create different levels within the library, such as a quiet reading room on a higher level offering views and a children's section on a lower, more playful level.

Modernist Architecture: The Seattle Central Public Library: Better Late than Never

Exhibition:

- Dynamic Display Spaces:

  The slope could be used to create dynamic exhibition spaces with varying heights and perspectives. Exhibits could be displayed on ramps, terraces, or even suspended from the ceiling, creating a visually engaging experience.



https://www.archdaily.com/803001/nanning-planning-exhibition-hall-z-studio-plus-zhubo-design?ad_medium=gallery

Museum:

- Display Variety:
  - The slope could be used to create different display zones with varying levels of light and atmosphere, suitable for showcasing different types of artifacts.

How Varying Light and Atmosphere Enhance the Exhibition Experience:

- **Archaeological Artifacts:** Galleries with controlled humidity and temperature are necessary for preserving delicate archaeological artifacts. The sloping site allows for the creation of underground galleries with stable environmental conditions.
- **Sculptures**
- **Paintings**
- **Photographs**
- **Video Installations**

SOIL

Geology and Soil

The underlying basement of an area determines the rock type and eventually the soil Type.

Konza base is of complex metamorphic, igneous and sedimentary rocks. The dominant soil groups are ferromagnesian gneiss. artz rich
granitoid gneisses-typically **black cotton soils.**
The key characteristic of this soil type is
poor drainage, lo The hilly areas consist of qu**w fertility, black cracking and swelling firm clay soils.**

https://www.scribd.com/document/141407718/Konza-Local-Physical-Development-Plan-2012-2030

1. Poor Drainage

- Retains water, leading to **waterlogging** and weakening foundations.
- **Solution:** Install proper drainage systems (subsurface drains, stormwater management).

2. High Swelling and Shrinkage (Expansive Clay)

- Expands when wet, shrinks when dry, causing **foundation movement and cracks**.
- **Solution:**
  - Use **deep foundations** (piles, raft).
  - Excavate and replace soil with **murram or gravel**.
  - Stabilize soil using **lime or cement**.

https://www.skyscrapercity.com/threads/konza-konza-technopolis-u-c.351166/page-48?nested_view=1

3. Low Fertility and Erosion Risks

- Weak vegetation cover increases **erosion on slopes**.
- **Solution:** Use **landscaping, retaining walls, and erosion control measures**.

4. Structural Stability Challenges

- Causes **differential settlement**, leading to cracks in buildings.
- **Solution:** Use **reinforced foundations** and flexible structural joints.

. Road Construction Issues

- Roads become **impassable when wet** and develop **cracks when dry**.
- **Solution:**
  - Build on a **compacted gravel base**.
  - Reinforce with **geotextiles** for stability.

Source: https://en.wikipedia.org/wiki/Storm_drain

BUILDING CODES

National Building Code 2024

1. Siting and Space Requirements:

- **Building Setbacks:** For residential buildings, an open space of at least 6 meters wide is required at the front, extending the entire width of the building.
- **Access to Construction Sites:** Developers must ensure proper access to construction sites, including compliance with physical planning regulations and maintaining unobstructed routes for emergency services.

2. Design and Construction Standards:

- **Structural Integrity:** Buildings must be designed to withstand various loads, including wind, seismic, and thermal actions. The code specifies that structures should meet defined resistance, serviceability, durability, and reliability standards.
  B M Musau & Company, Advocates LLP
- **Fire Safety:** The code outlines requirements for fire resistance, including the use of non-combustible materials, installation of fire detection and suppression systems, and design of evacuation routes.
  National Crime Agency
- **Lighting and Ventilation:** Minimum standards are set for natural and artificial lighting, as well as ventilation, to ensure occupant comfort and health. For instance, specific window-to-floor area ratios are prescribed to allow adequate natural light.

Physical and Land Use Planning (Building) Regulations, 2021

Development Control:

- **Application Submission Requirements:**
  - **Site Plan:** Applicants must submit a detailed site plan drawn to a scale of not less than 1:500, clearly indicating the proposed development in relation to adjoining properties and infrastructure.
  - **Building Plans:** Detailed architectural drawings, including floor plans, elevations, and sections, drawn to a scale of not less than 1:100, must be provided.
  - **Environmental Impact Assessment (EIA):** For projects exceeding certain thresholds (e.g., developments covering more than 0.5 hectares), an EIA report must be submitted in accordance with the Environmental Management and Coordination Act.
- **Approval Process:**
  - **Timeline:** Upon submission of a complete application, the County Physical and Land Use Planning Liaison Committee is required to communicate its decision within 60 days.
  - **Public Participation:** For developments likely to have significant impacts, public notices must be issued, and stakeholders given at least 14 days to submit their views.

Building Standards:

- **Plot Coverage and Floor Area Ratio (FAR):**
  - **Commercial Zones:** A higher plot coverage of up to 75% is permitted, with a FAR of 2.5.
- **Building Heights:**
  - **High-Density Residential and Commercial Areas:** Building heights may be permitted up to 12 storeys, subject to compliance with aviation and other relevant regulations.
- **Setbacks:**
  - **Front Setback:** A minimum of 6 meters from the plot boundary facing the road.
  - **Side and Rear Setbacks:** A minimum of 3 meters to ensure adequate light, ventilation, and **privacy.**

Konza Technopolis Development Authority (KoTDA)

1. Standardization:

- **Building Codes Alignment:** In collaboration with UN-Habitat, KoTDA aims to harmonize building codes with international standards to ensure safety, functionality, and resilience. This includes adherence to global benchmarks for structural integrity, fire safety, and accessibility.
- **Infrastructure Specifications:** KoTDA has developed detailed infrastructure and parcel development guidelines to standardize the quality and specifications of public amenities, utilities, and transportation systems within the technopolis.

2. Sustainability:

- **Green Building Practices:** Developments are required to incorporate sustainable building practices, such as the use of energy-efficient materials, renewable energy sources, and water conservation systems. For instance, buildings are encouraged to achieve a minimum of 30% reduction in energy consumption compared to conventional designs.
- **Open Space Allocation:** The master plan includes a 60-meter-wide green boulevard that serves as a parkscape and public transit corridor, promoting environmental conservation and providing recreational spaces for residents.
  Konza Technopolis
- **Waste Management:** Developers must implement comprehensive waste management plans, including recycling and composting programs, to minimize environmental impact. The goal is to divert at least 50% of construction and operational waste from landfills.

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IMPALA RUGBY GROUNDS – GROUP 2 PERSPECTIVES

B.A.S YEAR IV CONTRIBUTING STUDENT RESEARCHERS AND DESIGNERS - 2024/2025

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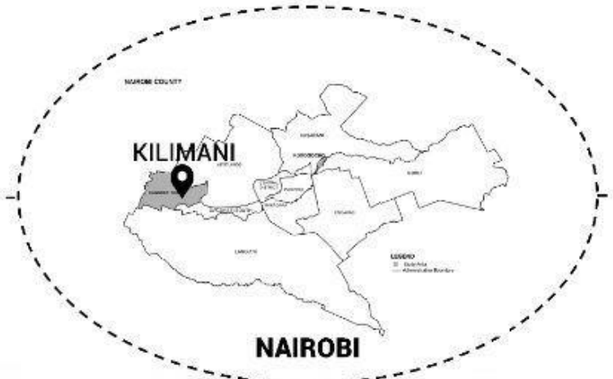
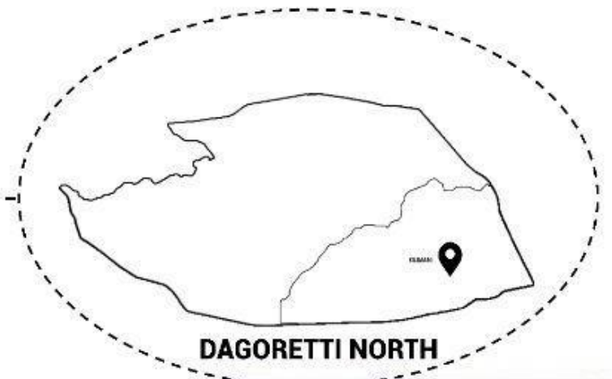
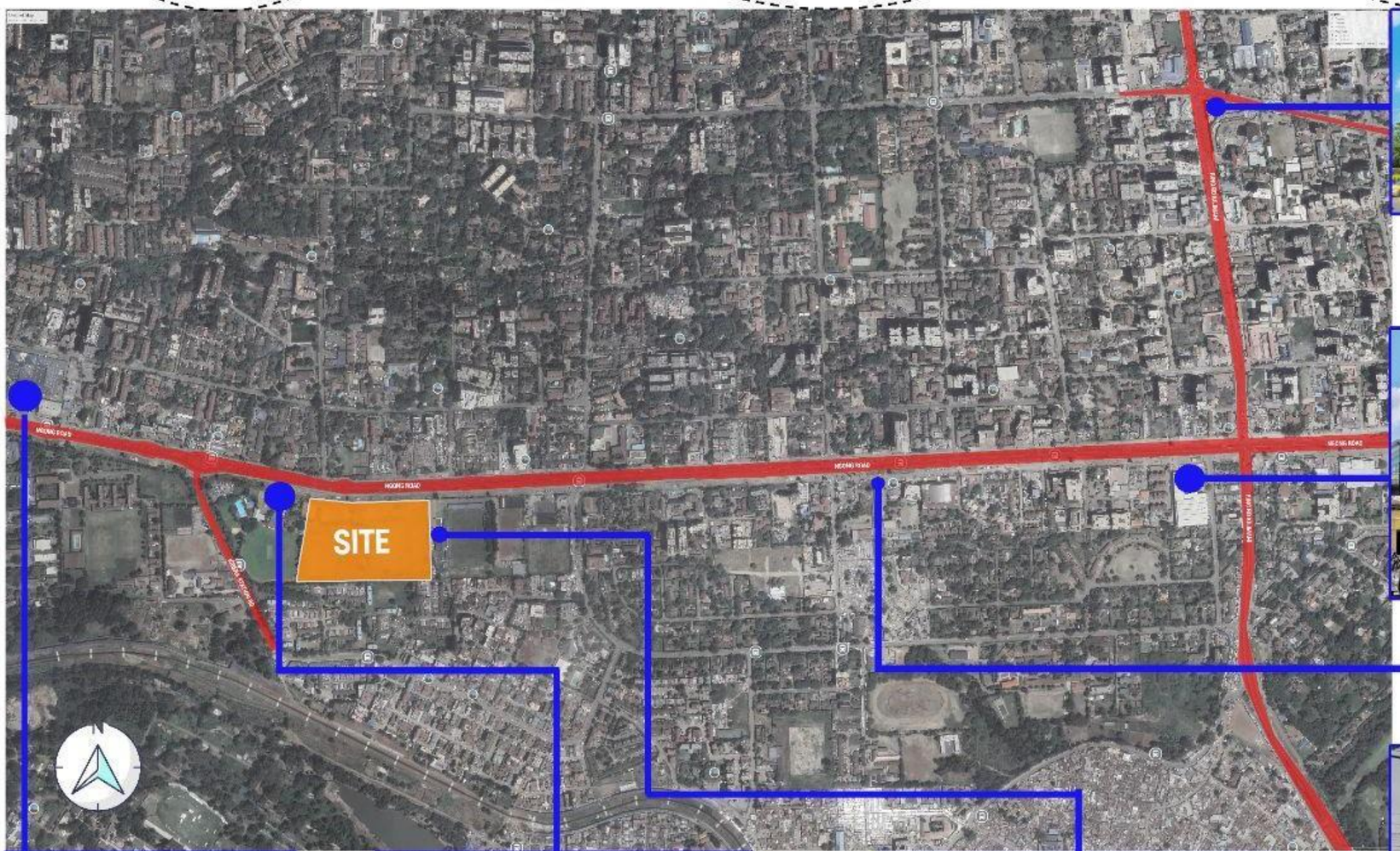
SITE LOCATION AND CONTEXT







YAYA CENTER
Source: Coralpi.com

PRESTIGE PLAZA
Source: Prestige plaza shopping mall(2023)

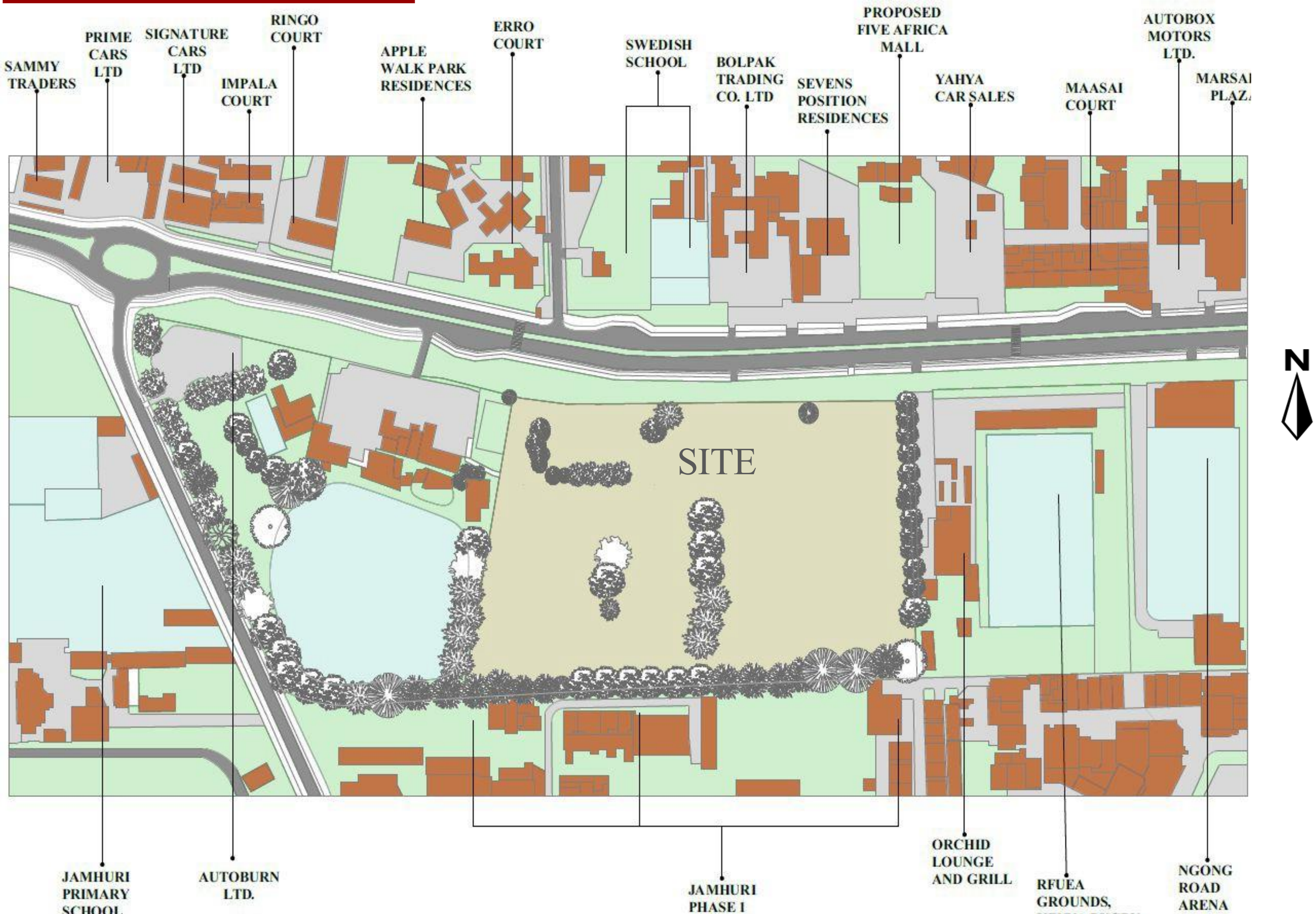
ADAMS ARCADE
Source: Google maps(2025)

JUNCTION MALL
Source: Fashion tribe influencer(2019)

IMPALA CLUB
Source: Google maps(2025)

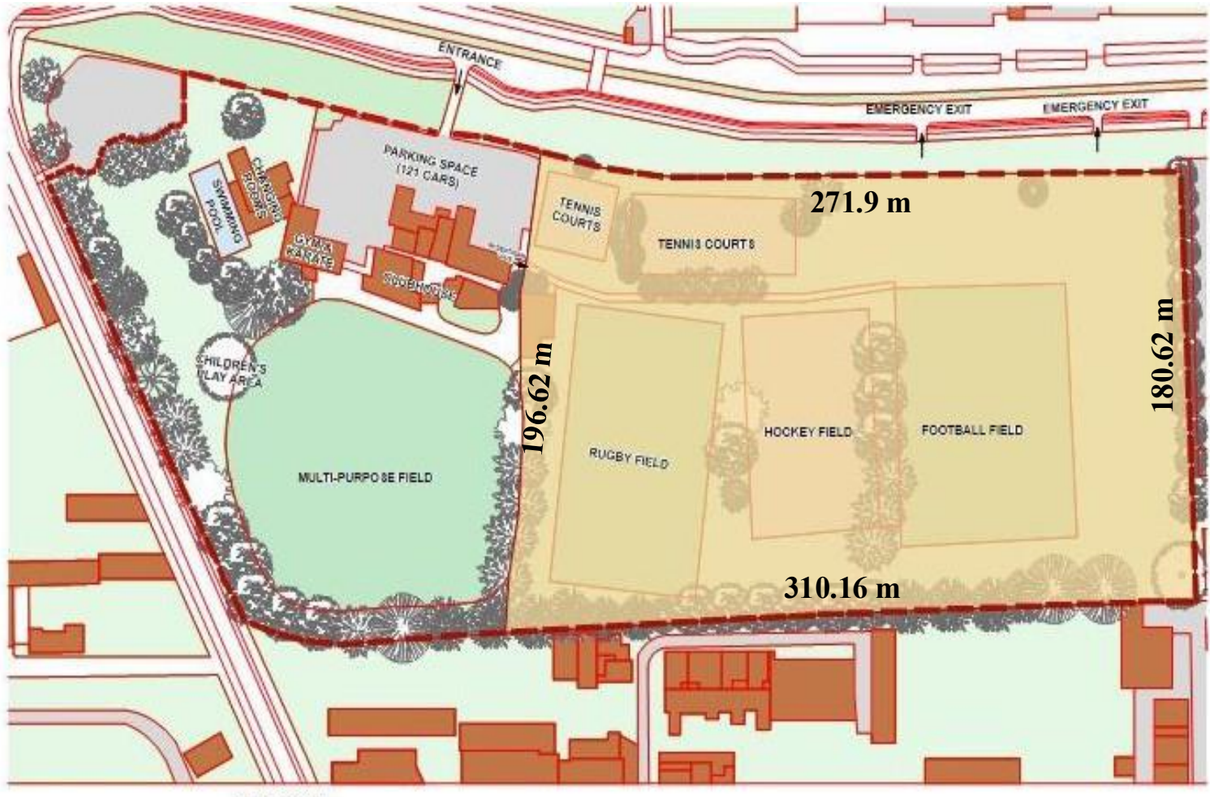
THE ORCHID LOUNGE & GRILL
Source: Google maps(2025)

NEIGHBOURHOOD ANALYSIS



Map showing different activities for the neighbourhood
Source : Author (Amimo), 2025

SITE CONTEXT AND NEIGHBORHOOD



The site area is 54,435.43 square metres

Impala grounds site
Source: Author (Amino), 2025

Site History

The Impala Rugby Club grounds have a rich history intertwined with the development of rugby in Kenya. Here is a little of its history

1930: The club's roots trace back to the Old Cambrians, a team formed by former students of Prince of Wales School (now Nairobi School).

Post-WWII Revival: The club was revived in 1945 after a period of dormancy.

1949: Acquisition of Ngong Road Grounds: A significant milestone was the acquisition of the current Ngong Road grounds.. This provided a home for the club and its growing membership.

1953: The club was renamed Impala RFC, marking a new chapter in its history.

1950s-1970s: A Golden Era: Impala won numerous championships establishing itself as a powerhouse in Kenyan rugby.

1974: Consecutive Enterprise Cup Wins: A remarkable achievement was winning the Enterprise Cup four consecutive times from 1971 to 1974.

1986: Clubhouse Fire: A devastating fire destroyed the original clubhouse in 1986, but the club bounced back with a renewed spirit.

1988: New Clubhouse: A new clubhouse was constructed, providing modern facilities for members and visitors.

Present Day: The Impala Club continues to be a prominent force in Kenyan rugby, producing top-level players and hosting major tournaments.

Community Hub: Beyond rugby, the club serves as a social and community hub, offering a range of sporting and recreational activities.

The Impala rugby club grounds remains a cherished venue for players, fans, and the wider community.

Swimming pool
Source: https://uzamart.com/listing/impala-club/

Children play area
Source: Google earth 2024

Club house
Source: Lawsther technologies 2023

Playfields
Source: Google earth 2024

Pedestrian gate
Source: Authors 2025

Suitability of the Three Proposed Developments with regard to history and interior context :

LIBRARY

A library has potential of bringing community engagement but it might conflict with the main function of sports. It is therefore the **least suitable.** A sports library may be a solution.

MUSEUM

A museum can be viable to display the rich history of the club. The only challenge is that a museum only for club history may have limited appeal. It is therefore **suitable.** To enhance this, wide variety of sports may be considered for the museum.

EXHIBITION

An exhibition is versatile and adaptable to different uses. It has the potential to attract the broader community while still maintaining their sports program. It is therefore the **most suitable.**

NEIGHBORHOOD ANALYSIS

Map showing the neighbourhood of Impala Club grounds
Source: Mapbox

The site is located along Ngong road in a zone known for its upscale residential areas, commercial centres and proximity to sport areas that serve as social and community hubs, attracting people from diverse backgrounds for leisure, entertainment and social gathering.

Main social classes inhabiting the neighbourhood are upper middle and upper class, characterized by high income business owners and diplomats.

Predominant settlement in the area is a mix of residential and commercial developments.

The settlements include:

- High Rise apartments and gated communities catering to upper and upper middle class.
- Modern office buildings and commercial complexes.

Main social classes inhabiting the upper middle and upper class, characterized by high income professionals and business owners.

Also significant middle -lass population working in service sector and small businesses.

AGE GROUPS OF PEOPLE IN THE NEIGHBOURHOOD

- CHILDREN

- YOUTH

- ADULTS

- ELDERLY

USES AND ACTIVITIES IN THE NEIGHBOURHOOD

COMMERCIAL SPACES

1. SAMMY TRADERS

Is an open car yard for business of buying and selling cars.

Sammy traders Car yard
source : Google Earth, 2024

2. PRIME CARS LTD

Is an open car yard for business of buying and selling cars.

Sammy traders Car yard
source : Google Earth, 2024

3. SIGNATURE CARS LTD.

Is a car yard area for purchase and selling of vehicles.

Signature car yard
Source : Google earth, 2024

4. BOLPAK TRADING CO. LTD

This is a car yard for carrying out business of buying and selling of vehicles.

Bolpak trading co. ltd car yard
Source : Google earth, 2024

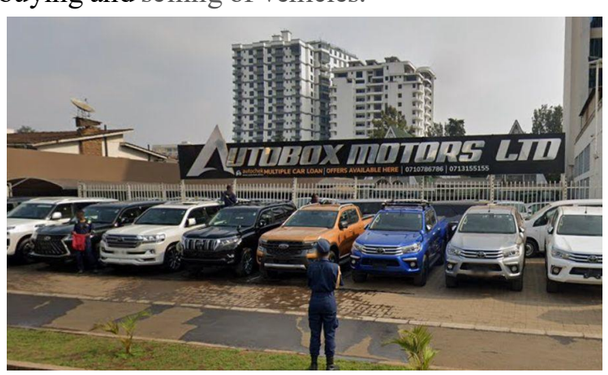
5. YAHYA CAR SALES

Is an open car yard for buying and selling of vehicles.

Yahya car sales yard
Source : Google earth, 2024

6. AUTOBOX MOTORS LTD

This is a car yard for carrying out business of buying and selling of vehicles.



Autobox motors car yard
Source : Google earth, 2024

7. PYRAMID MOTORS

Is an open car yard for buying and selling of vehicles.

Pyramid motors car yard
Source : Google earth, 2024

8. MARSABIT PLAZA

Is a commercial building along Ngong Road with the following amenities:
shopping mall,clothing stores,sushi bar,shoe store and hardware store.

It also has a few offices in it.
Materials notable in the building are steel, stone, glass, concrete.
Building has adopted a contemporary style.

Marsabit plaza
Source : Google earth, 2024

9. ORCHID LOUNGE AND GRILL

It is a lounge and grill area that offers hospitality services to customers in form of foods and drinks, as well as leisure and recreation.
The joint houses people coming to watch games in the surrounding sports zones ie. Ngong arena, RFUEA grounds.
It is located along Ngong road, right next to the site.
The structure is composed of steel bars and trusses covered by an iron sheet roof.
It is a potential for noise generator due to music

Orchid lounge and grill
Source: Google earth 2024

RESIDENTIAL SPACES

1. IMPALA COURT

It is a gated community with 2-storey buildings.
The entrance is located along Ngong rd.
Notable materials that have been used in the design include masonry blocks,glass, wood, aluminium and steel.

Impala court
Source: Google earth 2024

2. RISA COURT

This is a gated community,neighbouring Impala court.
The entrance is also along Ngong rd.
Materials notable are; masonry blocks,glass,brick, wood, aluminium, steel.
Gable roof is the typical roof for houses in this court.

Risa court
Source: Google earth 2024

3. APPLE WALK PARK

Is gated community, with 4 storey buildings, accessed from Ngong road.
Notable materials are; glass, bricks, masonry blocks, concrete, steel, clay tiles.

Apple walk Park
Source: Google earth 2024

4. ERRO COURT

Is gated community, with 3 storey buildings, accessed from Makini Rd off Ngong road.
Notable materials are; glass, bricks, masonry blocks, concrete, steel, clay tiles.

Erro court
Source: Google earth 2024

5. SEVENS POSITION

Is gated community, with 4 storey buildings, accessed from Ngong road.
Notable materials are; glass, bricks, masonry blocks, concrete, steel, clay tiles.

Sevens Position Apartments
Source: Google earth 2024

6. MAASAI COURT

Is a gated community of 2 story buildings typically with gable roof.
Materials notable are masonry blocks, concrete, glass, steel, aluminium and clay tile roof.

Maasai court
Source: Google earth, 2024

7. JAMHURI PHASE 1

Is a gated community where middle class reside in, just adjacent to the Impala grounds.

Is accessed from Kibera Station road, off Ngong road.
The gated community comprises of different typologies of housing units for residence.

Jamhuri phase 1 flats
Source: google earth, 2024

EDUCATIONAL SPACES

1. SWEDISH SCHOOL

Is accessed from Makini Rd off Ngong Rd.
The buildings are two storey building.
Notable materials used in the school are brick, clay tiles, glass, steel.

Swedish School
Source: Google earth, 2024

A social open space in Swedish School
Source: Google earth, 2024

2. JAMHURI PRIMARY SCHOOL

Is accessed from Makini Rd off Ngong Rd.
Comprises of designated learning spaces as well as play areas ie. astroturfs, tennis courts.

Jamhuri primary school
Source: Google earth, 2024

SOCIAL SPACES

1. NGONG ROAD ARENA

Is a social space where people from different backgrounds come to play sports.
It has an astroturf with seating areas.

Ngong Rd Arena
Source: Google earth, 2024

2. RUGBY FOOTBALL UNION OF EAST AFRICA GROUNDS

Is a social space that hosts local and international rugby games and people who come to watch games.

RFUEA grounds
Source: Google earth, 2024

ACCESS

Map showing the various access routes and points to the site
Source: Authors, 2025, adapted from Google Earth.

The location is located **7.7km**, a **37 minutes** drive from Nairobi Central Business District. There are two routes to the site:

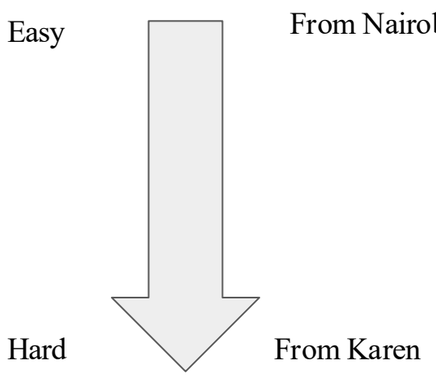
- **From Nairobi CBD:**

Accessed through Haile Selassie avenue that joins into Ngong Rd at Nairobi Club, continue with Ngong Rd then take a left turn 500m past The Orchid Lounge & Grill.

- **From Karen:**

Accessed through Kerarapon drive that joins into Ngong Rd then take first exit at the roundabout near Acacia Court then make u-turn at Ole dume Rd back to Ngong Rd then take a left turn 500m past The Orchid Lounge & Grill.

Ease of Access



Hierarchy of ease in access to site.
Source: Authors, 2025

The rank of the ease was done in consideration to the lane that has a lot of traffic as one heads to site during the peak hours.

Features of Ngong Road:

1. Dual carriage two way traffic highway 6.5m each way.
2. Traffic jam towards Nairobi during peak hours (6am and 5.30pm)
3. High traffic of vehicles throughout.
4. Well lit with street lights
5. Has demarcated pedestrian crossing areas and bus stops.
6. The road is well drained with open water drainages.

View of Ngong Rd and the pedestrian crossing area near site
Source: Google Earth, 2025

View the open drainage along Ngong Rd.
Source: Authors, 2025

Access Points via Ngong Rd.

Along Ngong Rd there are three entry points:

1. Main gate
2. Two temporary gates

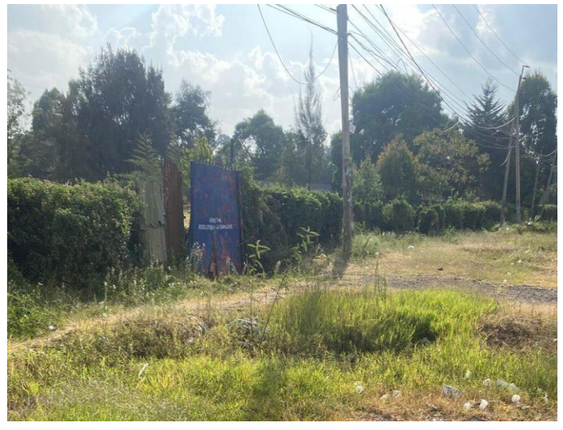
Main Gate:

Is the main entry point to the proposed site.
Has the pedestrian and vehicular gates.
Visitors sign in at the gate as a security measure.
The drive to the gate is about 30m aways from Ngong Rd.

Main Gate of Impala Club
Source: Authors, 2025

Temporary Gates:

These are located along the live fence of the Impala Club.
They are used during large events as entry points for the large crowd.
Mainly made of iron sheets.
Leads directly to the proposed site



One of the temporary gates of Impala Club
Source: Authors, 2025

Suitability of Vehicular Access point along Ngong Rd

The main gate is crucial for security purposes and has the access to the existing parking lot of 100 vehicles.

Well positioned driveways that allows easily flow of traffic along the main road.
Allows for security search and directs to the reception desk.

Parking Space at Impala Club..
Source: Authors, 2025

Pedestrian Access:

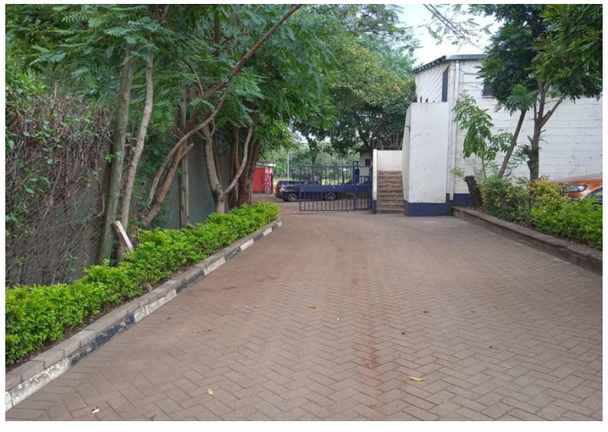
View of the bus stop along Ngong rd. towards Karen.
Source: Authors, 2025

The main access for pedestrian is via the **main gate via Ngong Rd.**
Ngong road has well placed bus stations that is a 2 minute walk to the main gate
There is also a small gate inside the club that leads to site using the club route.

Suitability of Pedestrian Access point along Ngong Rd

Allows for a more controlled pedestrian traffic.
Is closer to the public transport areas thus an ease to access by the general public.
Has well constructed pedestrian walkways that is free from bicycles and motorbikes thus is safe.

View of the pedestrian walkways along Ngong Rd.
Source: Authors, 2025



View of the entrance gate to site through Impala club.
Source: Authors, 2025

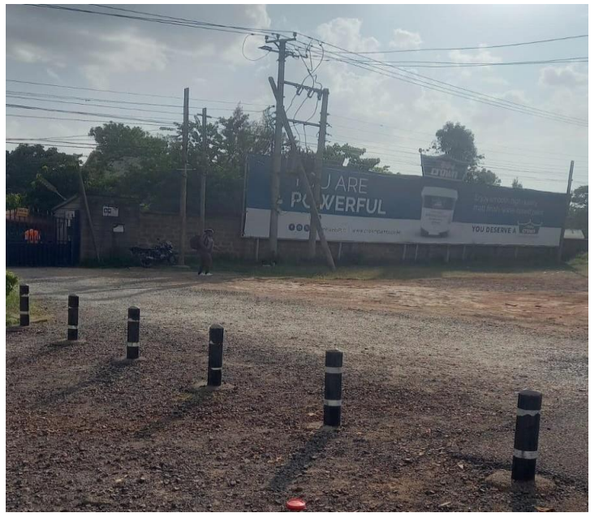
Recommendations

1. There is need for **road signage** along the road and particularly near the zebra crossing areas near the site.

Road signs
Source: Shutterstocks

2. Since the site is not at the Impala club buildings, then a n**eed for a different access gate** to the proposed project will be important.

3. Designing for **Universal accessibility:** whereas there are pedestrian and cycling ways, persons with disability may find it difficult to navigate the earth road that leads to site, thus need for a smooth access road by using cabros for example.

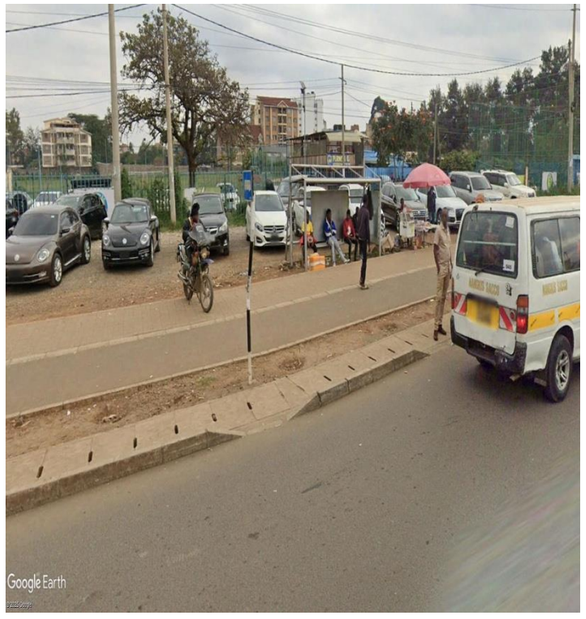


Current state of the access road to Impala club.
Source: Authors, 2025

A cabro paved road in Nairobi.
Source: Propavers, 2023

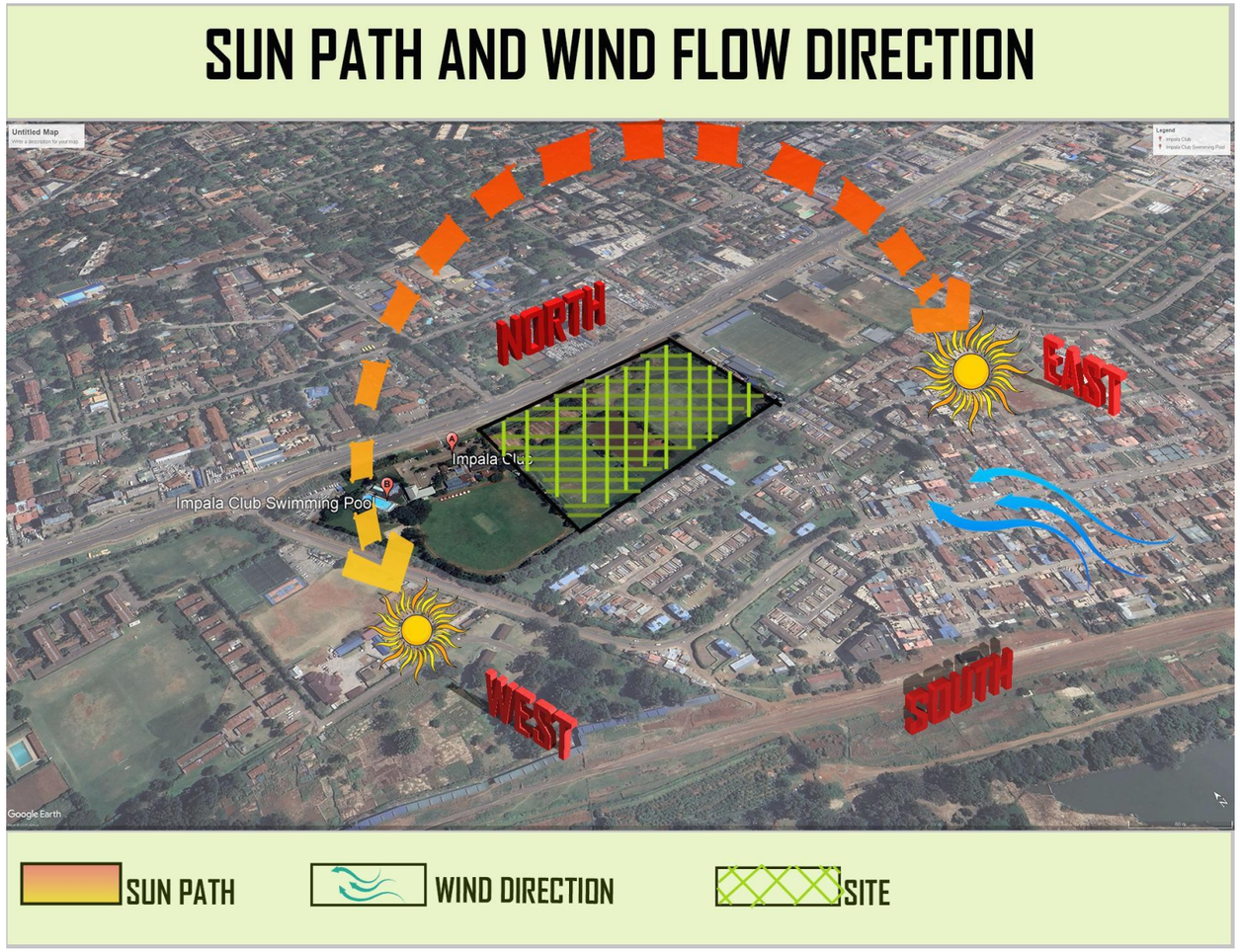
4. There is need to consider access by emergency service vehicles that can have access to the site seamlessly without affecting regular flow.

5. Provision of street furniture like a shade at the bus stop near the site for pedestrian traffic comfort. One such has been provided at the intersection points of Ngong Rd and James Kang'ethe Rd.



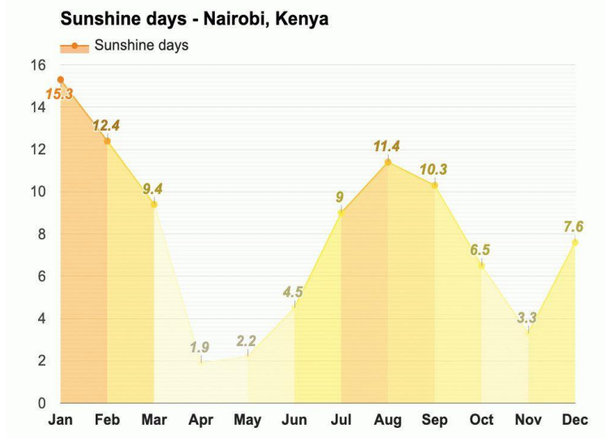
A shade along Ngong Rd.
Source: Google Earth, 2025

CLIMATE



Sun path and wind direction
Source: google earth and edited in photoshop

1. Solar Radiation



Graph of sunshine hours against days
Source: weather-atlas

In Nairobi, January records the highest average daily sunshine, with approximately **9.54 hours of sunlight per day**, totaling **295.76 hours** for the entire month.

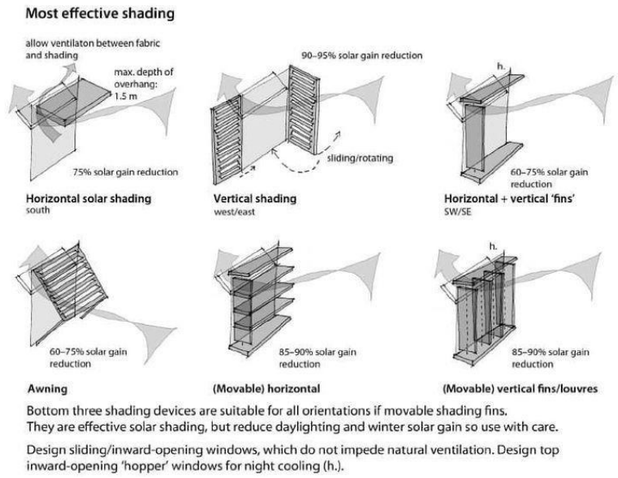
In contrast, April experiences the lowest average daily sunshine, with just **4.16 hours per day**, amounting to **128.93 hours** of sunlight during the month.

Over the course of the year, Nairobi receives a total of **2,465.64 hours of sunshine**, averaging about **205.47 hours of sunlight per month**.

Responses

A) Shading Devices

- **Horizontal Overhangs:** Effective for north- and south-facing windows to block high-angle midday sun while allowing diffused daylight.

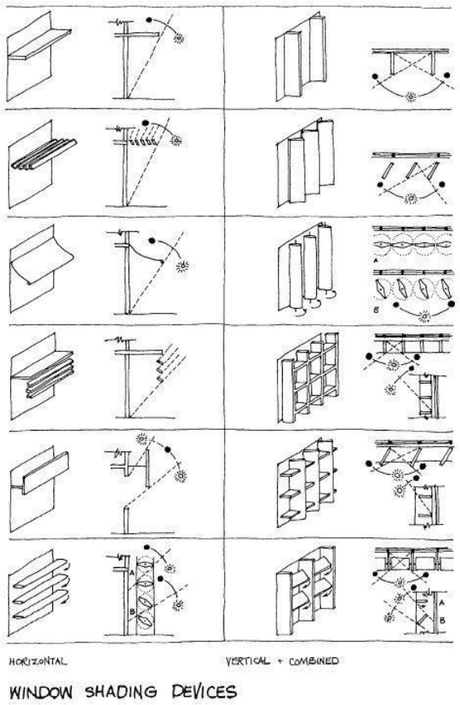


Diagrams of vertical and horizontal shading devices
Source: pinterest.com

- **Movable Shading Systems:** Adjustable screens or blinds that adapt to changing solar angles throughout the day and year.

- **Brise-Soleil:** Perforated or solid shading screens provide both aesthetic and functional benefits.

Image of brise-soleil
Source: archdaily



Operable shading devices details
Source: pinterest.com

- **Vertical Louvers or Fins:** Ideal for east- and west-facing facades to reduce heat gain from low-angle morning and afternoon sun.

B) Window Design and Placement

- **Optimal Orientation:** Minimize large openings on east- and west-facing facades to reduce direct solar gain. Maximize north- and south-facing windows for controlled daylight.

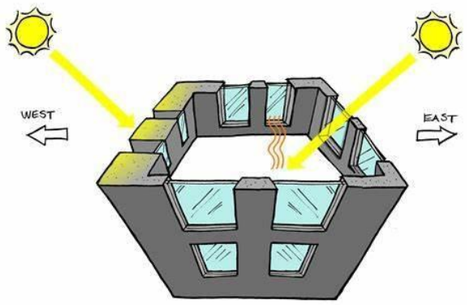
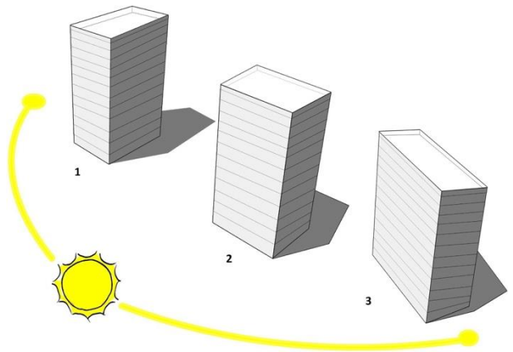


Image showing opening orientation and effect Source: venturewell.org

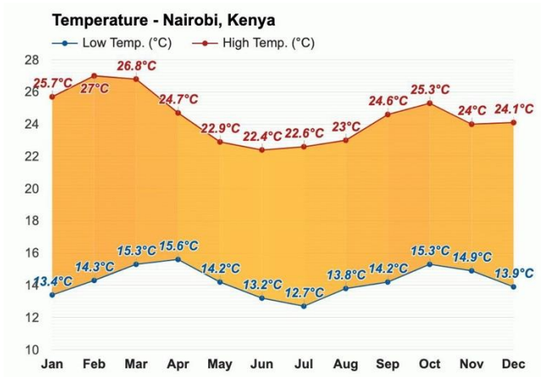
C) Building Orientation

- Align the building's **longer axis east-west** to reduce solar exposure on the shorter east- and west-facing walls.
- This orientation minimizes the heat gain during the hottest parts of the day while optimizing natural daylight.



Showing orientation of building and sun path Source: venturewell.org

2. Temperature



Graph of temperature against months
Source: weather-atlas

Average high temperature in January: **25.7°C**

The warmest month (with the highest average high temperature) is **February** (27°C).

The month with the lowest average high temperature is **June** (22.4°C).

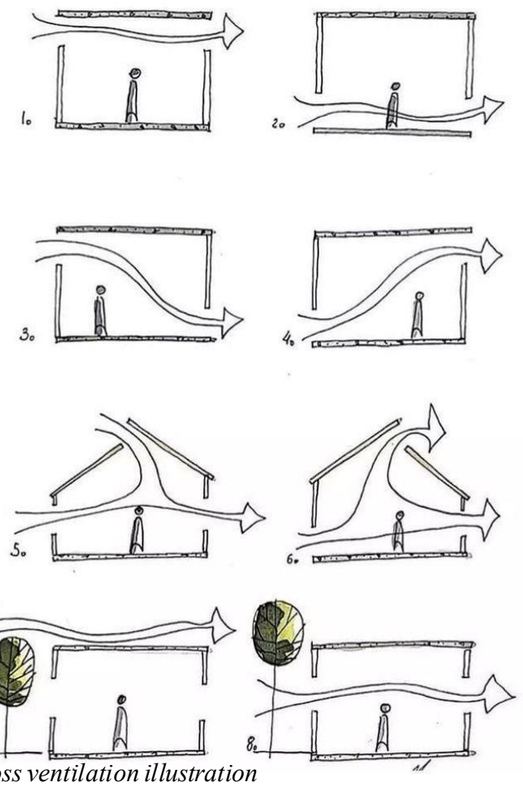
Average low temperature in January: **13.4°C**

The month with the highest average low temperature is **April** (15.6°C). The coldest month (with the lowest average low temperature) is **July** (12.7°C).

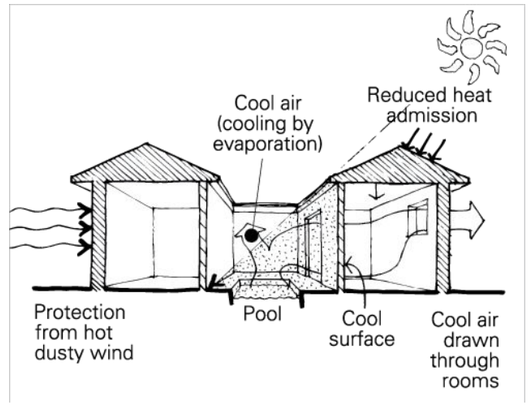
Responses

A) Ventilation Strategies

- **Cross-Ventilation:** Orient openings to align with prevailing wind directions, promoting natural cooling and reducing dependence on mechanical systems.
- **Stack Ventilation:** Use taller spaces or thermal chimneys to expel hot air as it rises, allowing cooler air to flow in.
- **Shaded Courtyards:** Incorporate open or semi-enclosed courtyards shaded by trees or overhangs to enhance airflow.



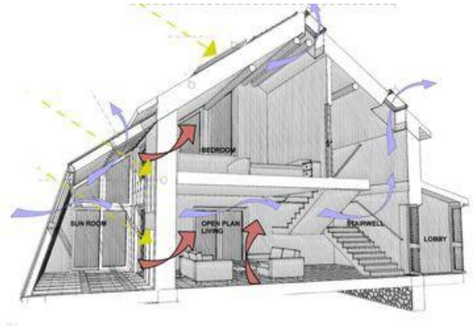
Cross ventilation illustration
Source: pinterest.com



Courtyard in cooling of buildings
Source: pinterest.com

B) Indoor-Outdoor Transition Spaces

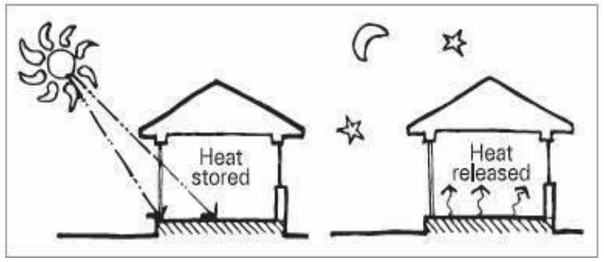
- **Verandas and Balconies:** Create shaded transitional spaces that allow for outdoor living while protecting from direct sun exposure.
- **Pergolas and Canopies:** Use outdoor shading structures to reduce heat entering through large openings



Verandahs/balcony in temp. Regulation
Source: cambridge-k1.co.uk

C) Thermal Mass:

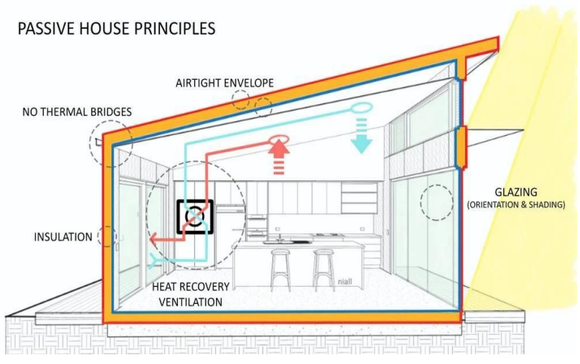
- Use high-thermal-mass materials (e.g., stone, concrete, or adobe) to absorb heat during the day and release it at night, moderating indoor temperatures.
- Combine with insulation to prevent unwanted heat transfer.



Heat loss and gain in buildings
Source: fairconditioning.org

D) Insulation and Envelope Design

- **Walls:** Incorporate insulated walls to prevent heat loss during cooler nights and reduce heat gain during the day.
- **Roofs:** Use reflective materials or **cool roof coatings** to minimize solar heat absorption.
- **Windows:**
  - Install **double-glazed windows** for thermal insulation.
  - Use **low-E glass** or window films to reduce heat gain while maintaining natural light.

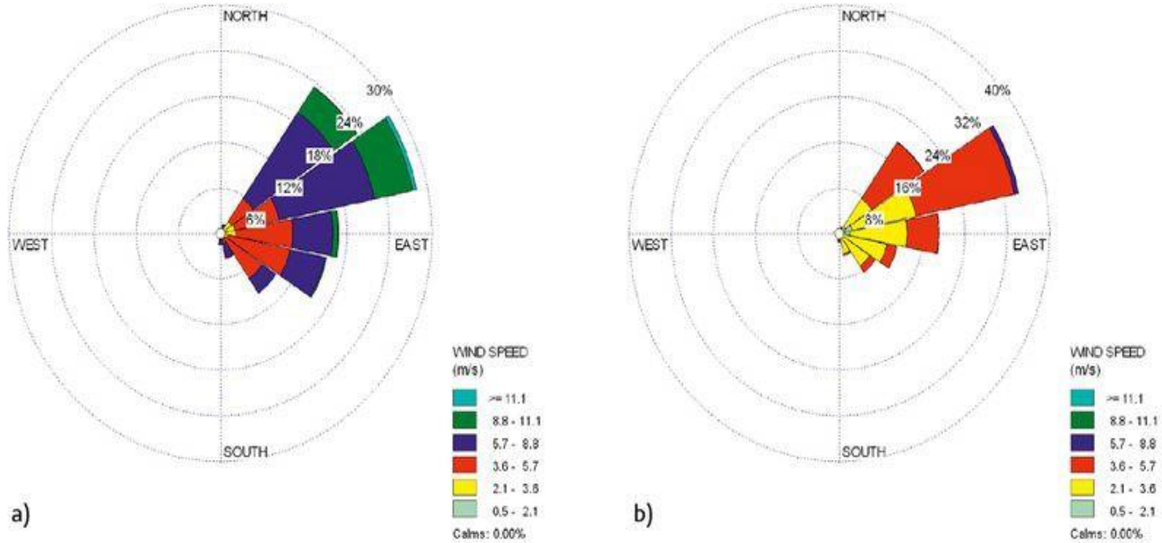


Passive principles
Source:bioenergyconsult

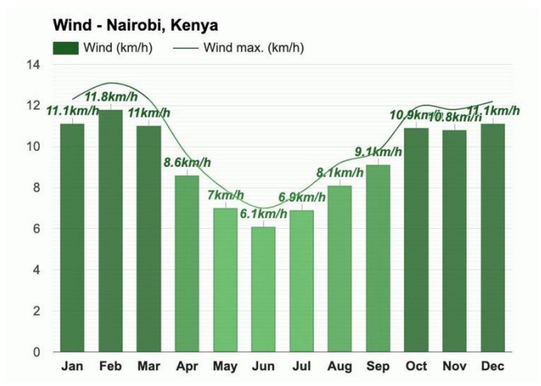
The focus in Nairobi is on **passive strategies** that optimize ventilation, thermal mass, and shading while ensuring materials and building orientation are suited to the mild, temperate conditions.

These measures create energy-efficient, sustainable buildings that are comfortable year-round.

3. Wind



Windrose graphs of Nairobi
Source:researchgate.net TY - JOUR, AU Ongoma, Victor, Muange, Pamela, Shilenje, Zablon W. PY - 2016/03/13



Graph of Nairobi wind speed
Source: weather-atlas

Average wind speed in December: **11.1km/h**

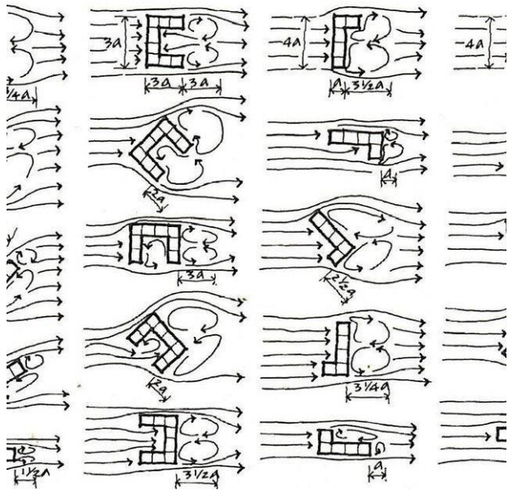
The windiest month (with the highest average wind speed) is **February** (11.8km/h). The calmest month (with the lowest average wind speed) is **June** (6.1km/h).

Responses

Design responses to wind are essential to optimize airflow, improve thermal comfort, and protect buildings and occupants from adverse wind effects.

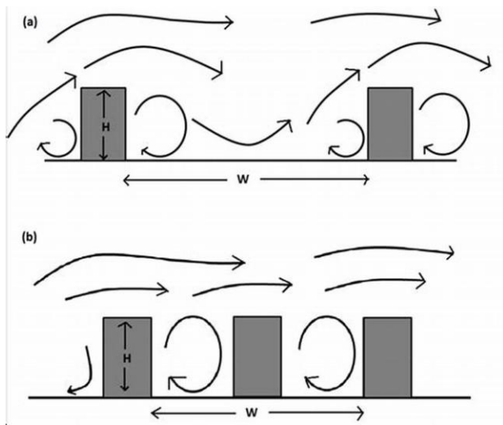
A) Building Orientation and Layout

- **Optimize Orientation:** Orient buildings to face the **prevailing southeast winds**, maximizing natural ventilation and reducing reliance on mechanical cooling systems.



Wind behaviour with various building shapes
Source: researchgate.net TY - JOUR AU Du Yan, Zhu Zhongcui. PY - 2023/04/01

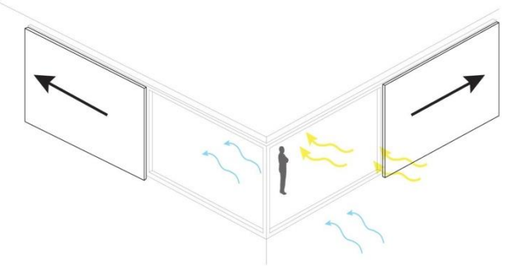
- **Avoid Long, Flat Facades:** Long facades perpendicular to the wind can create pressure imbalances. Break up facades or use aerodynamic forms to minimize wind resistance.



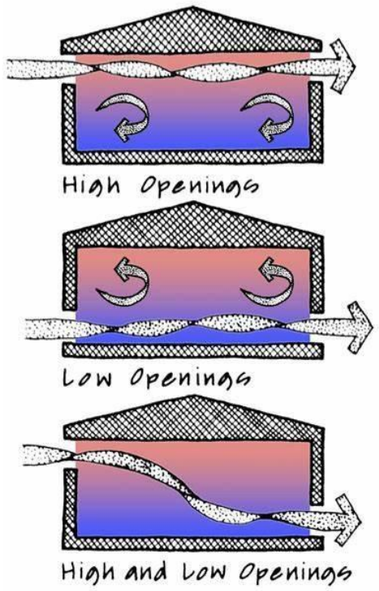
Building heights and wind interaction
Source: lidarandradar.com

B) Openings and Ventilation

- **Cross-Ventilation:** Position windows and openings on opposite sides of the building (aligned with the southeast-northwest axis) to allow air to flow naturally through interior spaces.
- **Operable Windows:** Use adjustable windows to regulate airflow based on wind intensity and occupant comfort.

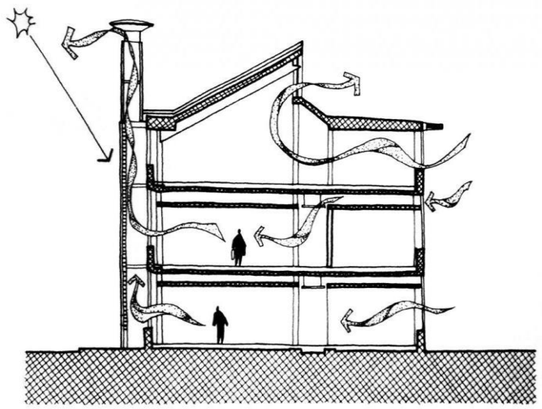


Operable window
Source: littledoseofevy.blogspot.com



Different placement of openings
Source: venturewell.org

- **Louvered Openings:** Install louvers to filter wind, control airflow, and prevent strong gusts or dust from entering.
- **Ventilation Towers or Thermal Chimneys:** Incorporate vertical elements that use the stack effect to enhance air circulation by expelling hot air and drawing in cooler wind.

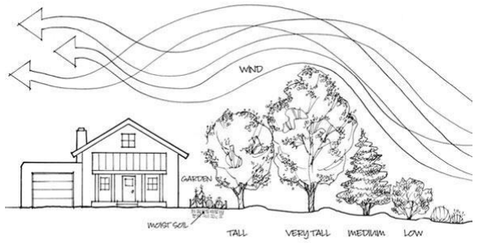


Chimney effect in air circulation
Source: pinterest.com

C) Shading and Wind Filters

- **Screens and Louvers:** Install perforated screens, brise-soleil, or vertical louvers on wind-facing facades to reduce wind pressure while allowing ventilation.

- **Vegetative Windbreaks:** Plant trees, shrubs, or hedges as natural barriers to diffuse wind speeds and reduce turbulence.



Trees as windbreakers
Source: permadesign

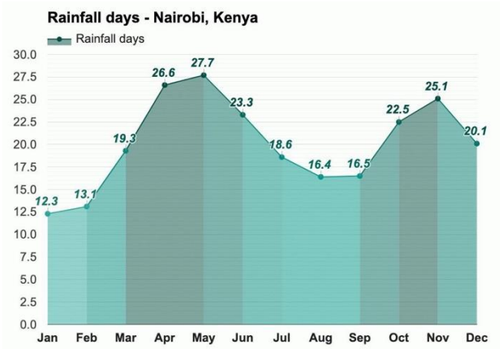
- **Courtyards and Canopies:** Use semi-enclosed outdoor spaces to create protected areas where wind speeds are reduced, improving outdoor comfort.

Courtyards as wind shield areas
source:artpal.com

By strategically designing for wind, buildings can achieve **improved thermal comfort, natural ventilation, and energy efficiency** while ensuring occupant safety.

4. Rainfall

Nairobi's climate is influenced by its equatorial location and altitude, resulting in a **bimodal rainfall pattern**.



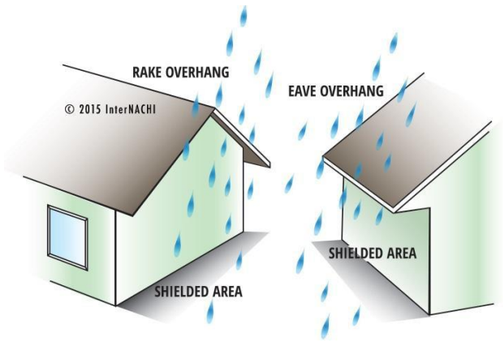
Graph of Nairobi rainfall against months
Source: weather-atlas

Average rainfall days in December: **20.1 days**
The month with the highest number of rainy days is **May** (27.7 days). The month with the least rainy days is **January** (12.3 days).

Responses

A) Roof Design

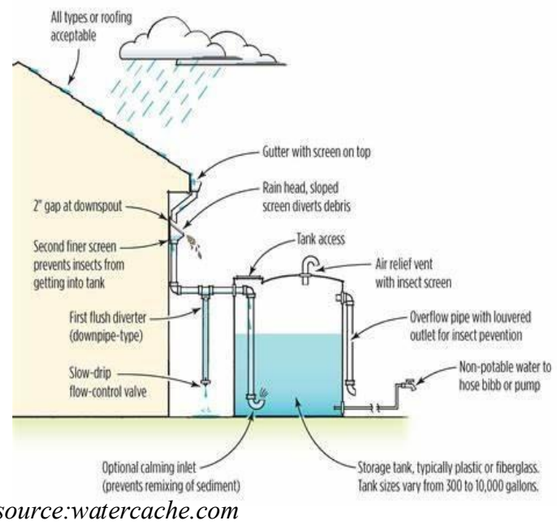
- **Steep Roof Slopes:** Design roofs with a slope of at least **30 degrees** to facilitate rapid runoff of rainwater, reducing the risk of pooling.
- **Overhangs and Eaves:** Use wide roof overhangs to protect walls, windows, and entrances from rain splash.
- **Gutters and Downspouts:** Install efficient drainage systems to channel rainwater away from the building.
- **Green Roofs:** Consider green roofs to absorb rainwater, reduce runoff, and provide thermal insulation.



Overhang shed for wall protection
source:https://www.nachi.org/

B) Rainwater Management

- **Rainwater Harvesting:** Incorporate systems to collect and store rainwater for reuse in irrigation, cleaning, or non-potable domestic use.
- **Permeable Surfaces:** Use permeable paving or landscaping to reduce surface runoff and allow water to percolate into the ground.
- **Stormwater Drains:** Design efficient drainage systems to handle heavy downpours and prevent flooding around buildings.



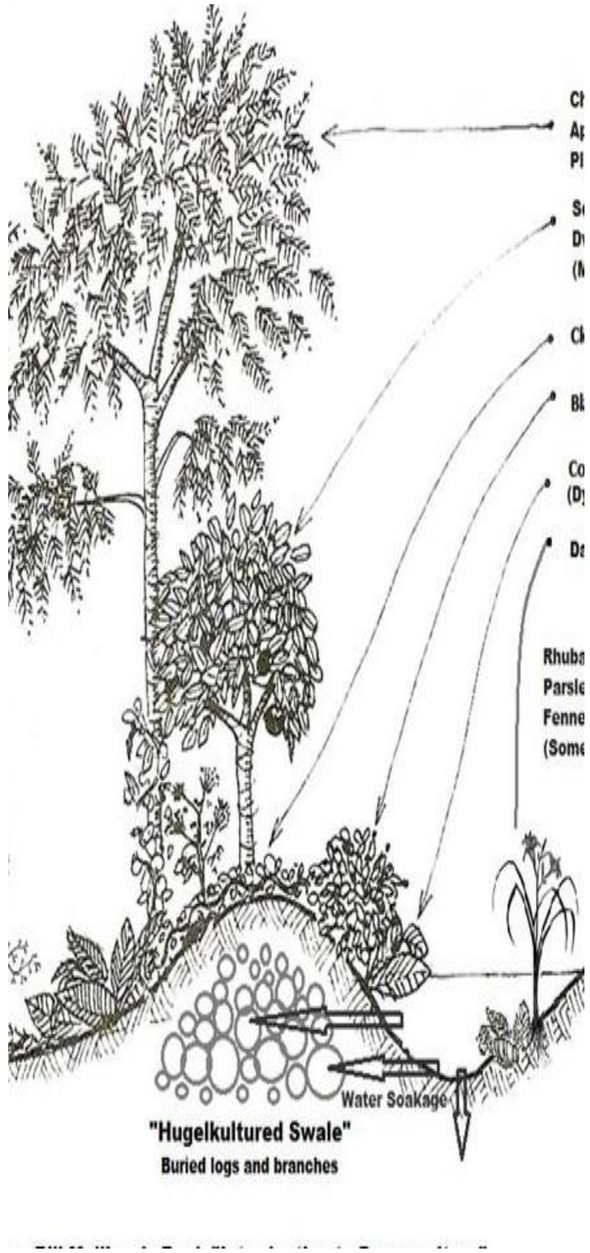
source:watercache.com

C) Landscaping

- **Rain Gardens:** Use rain gardens to absorb and manage runoff while enhancing the site's aesthetic appeal.
- **Vegetation for Erosion Control:** Plant grass, shrubs, or trees to stabilize soil and prevent erosion in areas prone to heavy rains.

3d of raingarden
source:biblus.accasoftware.com

source:biblus.accasoftware.com
Section showing the rain garden



Water penetration using the roots of vegetation.
Source: pinterest.com

Rainfall in Nairobi plays a crucial role in shaping building design, particularly in **managing water effectively and ensuring material durability.** Proper planning for roof design, drainage systems, and rainwater harvesting can mitigate challenges such as flooding and dampness while promoting sustainability.

TOPOGRAPHY

A cross section illustration depicting the gentle slope of the site (gradient of 3.3%)

The site is relatively flat with a gradual and gentle slope towards the East.

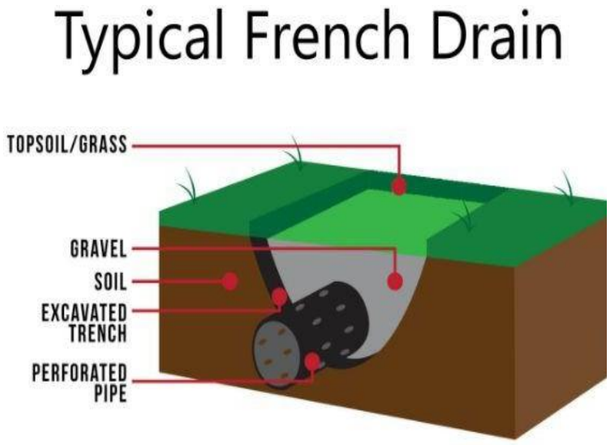
This makes it easier to design and construct buildings with minimal excavation and grading required.

The terrain is easier to navigate making it suitable for universal design principles, such as creating barrier-free access for people with disabilities.

Image showing the terrain of the site
Ian Ashitiba ,2024

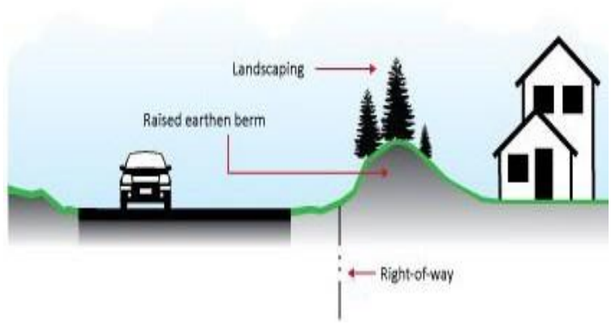
Responses:

- Drainage solutions, such as stormwater management systems or grading, to prevent waterlogging during heavy rainfall.
- Use of architectural elements such as terraces, raised platforms, or roof gardens to create artificial vantage points.
- Earth berms, green buffers, or soundproofing elements to mitigate noise from the adjacent Ngong Road.



French drain to manage storm water
Source: wearegro.com

Hussein, 2024



Earth berms for soundproofing
Source: x.com/google images

SOIL

The main soil types on site are Black cotton soils and red volcanic soils.

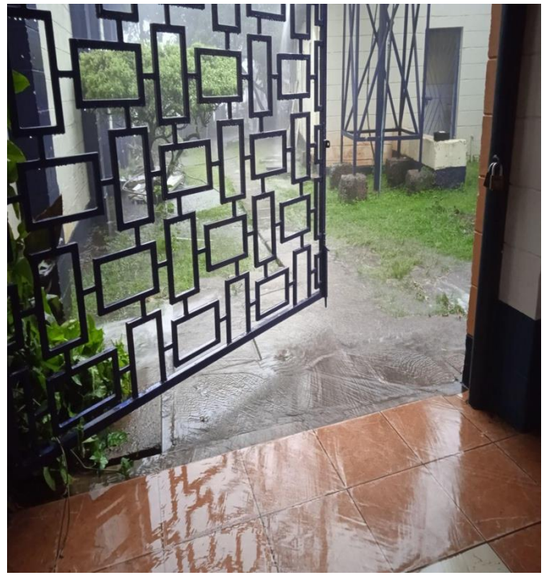
Amimo,2024

Andosols often have a Reddish-brown color due to iron and aluminum oxides.They have high porosity, excellent drainage, and are rich organic matter.

Amimo,2024

Their low bulk density and high organic matter content can result in poor load-bearing capacity, making them unsuitable for heavy structures unless stabilized.

The gray coloured **Vertisols** are clayey, with high clay content ,are poorly drained and prone to waterlogging



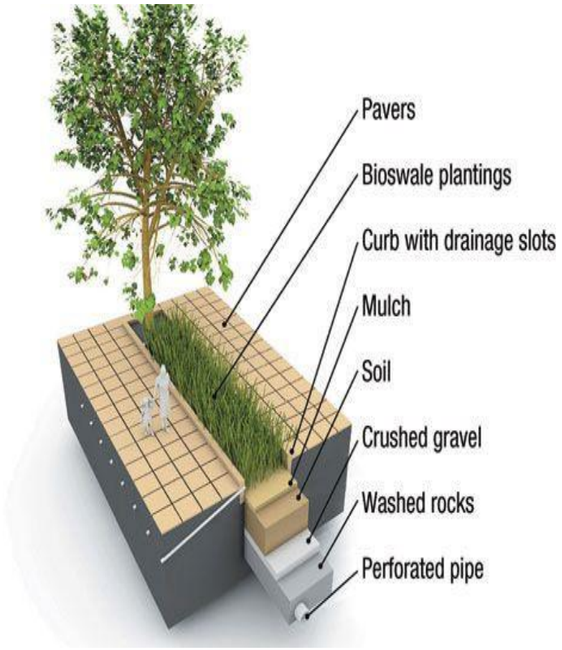
Hussein,2024

Vertisols expand significantly when wet and shrink when dry causing cracking of foundations, walls which leads to structural instability over time.

Hussein,2024

Responses:

1. Proper drainage design and waterproofing measures.



Nadine M. Post,2009

2. Larger or deeper foundations.to spread loads ; raft foundations for light structures to distribute loads evenly and minimize differential movement.

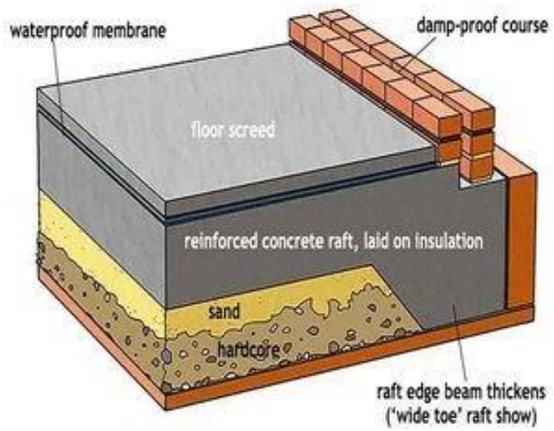
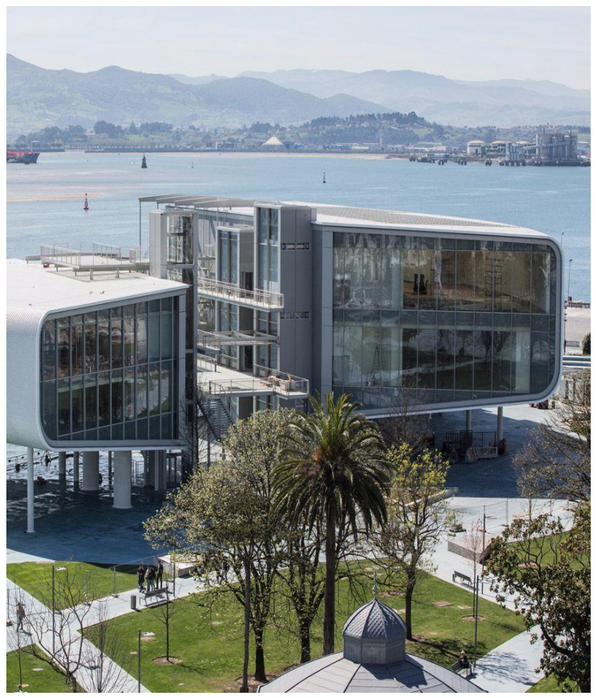


Image credit: Future

3. Incorporation of green spaces, gardens, and urban farming into the design to take advantage of the soil's fertility.

Mitchell Knapp,2016

4. Raised or stilted structures to minimize direct contact with the soil.



Danil Boparai | 18 August 2018

VEGETATION

The Impala Sports Fields in Ngong, Nairobi, feature a diverse range of vegetation types that contribute to the ecological balance and aesthetic appeal of the area.

Existing vegetation

- Grasslands: The sports fields are predominantly covered with grass species that are well-suited for recreational activities, since they are drought-resistant and can withstand heavy foot traffic.

Source: Antony Mwai, 2021

- The trees are mostly located at the periphery of the site, serving as a live fence.

Source: Author (Hadija), 2025

Acacia tree
Source: Instagram post, 2024

Pine tree
Source: Author (Hadija), 2025

Eucalyptus tree
Source: Magak Emmanuel, 2024

Acrocarpus Fraxinifolius
Source: Author, 2025

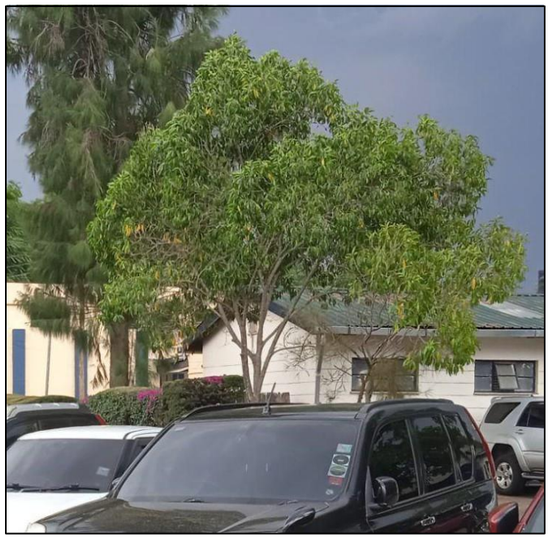
- It is a deciduous tree which sheds its leaves annually, coinciding with the dry season.
- Thrives in humid and sub-humid tropical climate with a short dry spell.
- This tree has a deep root system which is generally less problematic compared to trees with shallow root system.
- It is however,advisable to keep a safe distance from the building to avoid potential damage.

Croton Megalocarpus
Source: Author, 2025

- This tree is deciduous, it sheds its leaves annually, typically during the dry season.
- It has moderate water requirements, and is highly drought-resistant.
- It has a robust root system that is typically deep and spreading.
- It is, therefore, recommended to plant it ata a safe distance from the structure, and to construct root barriers to avoid potential structural damage.

Eucalyptus camaldulensis
Source: Author, 2025

- This species is evergreen, retaining its leaves throughout the year. It can also shed some leaves periodically.
- It can thrive in environments with variable water availability.
- It is known for its extensive and vigorous root system, which can spread far and wide, tapping into deep water sources. This can pose a significant threat to nearby building foundations, pipelines, and pavements.
- Therefore, maintain a significant distance between this tree and any buildings or infrastructure to prevent root intrusion.



Siris tree (Albizia Lebbeck)
Source: Author, 2025

- This is a deciduous tree, it sheds its leaves annually, typically during the dry season.
- The tree has moderate water requirements, is highly drought-tolerant.
- Albizia lebbeck has a robust and spreading root system, the roots are generally deep, and they also spread widely horizontally.

Duranta erecta
Source: Author, 2025

- It is an evergreen shrub in its native tropical environment but may behave as a deciduous plant in cooler climates.
- It can be thrive in a wide range of soil types, and prefers full sun for optimal growth.
- Duranta erecta has a relatively shallow root system, making it suitable for garden hedges and ornamental planting.

Neem tree
Source: Author, 2025

- The Neem tree is classified as an evergreen, meaning it retains its leaves throughout the year.
- The tree has a deep, extensive root system which can penetrate deeply into the soil.
- The roots can spread widely but are generally not aggressive toward structures.
- Neem trees are highly drought-resistant, thanks to their deep root systems.

- Shrubs and Bushes

Lantana Camara: Known for its rapid growth and ability to outcompete native plants.

Source: Author (Hadija), 2025

Aesthetic Value

The aesthetic appeal of the site is enhanced by:

- Visual Diversity: A mix of tree heights, shrub layers, and grassy expanses creates a visually appealing landscape.

Source: Author Hadija, 2025

- Recreational Spaces: Well-maintained grass areas provide inviting spaces for sports and leisure activities while shaded spots offer relaxation areas for spectators.

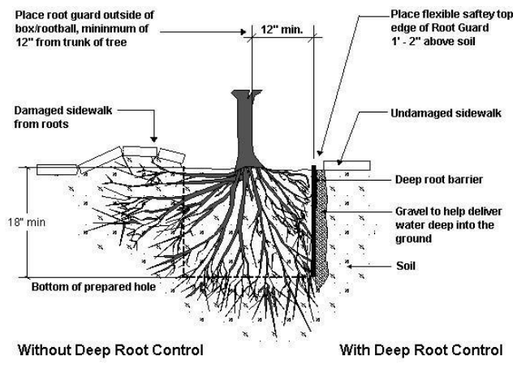
Ecological Importance

- Soil Erosion Control: The root systems of both trees and grasses help stabilize soil, preventing erosion during heavy rains.
- Climate Regulation: Vegetation helps in regulating the microclimate of the area by providing shade, absorbing carbon dioxide, and releasing oxygen.

Recommendations

- Retain the trees along the edge of the site to act as barriers to sound.

- Clear the trees at the centre of the site, to provide space for construction.



Source: Livingstone Shire Council,2016

- 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.

UTILITIES & SENSORY

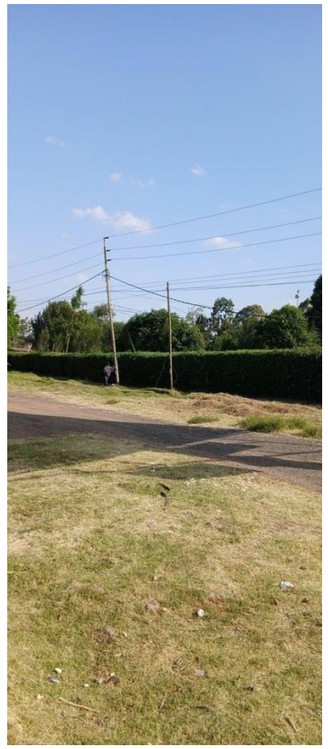
Water supply

- Residents of Kilimani, Nairobi, generally get their water supply from the Nairobi City Water and Sewerage Company (NCWSC), which sources water from dams like Ndakaini, Sasumua, and Ruiru.
- However, due to frequent water shortages, many residents supplement their supply with water from boreholes, private water vendors, or stored rainwater during the rainy season. Some residential buildings have their own boreholes to ensure a steady water supply

View of the water tank in impala grounds.
Source: Authors, 2025

Electricity supply

- Residents of Kilimani, Nairobi, get their electricity from Kenya Power and Lighting Company (KPLC), the national electricity provider. The power is supplied through a grid system that primarily relies on renewable energy sources such as geothermal (the largest source), hydropower, wind, and solar, as well as some thermal power from diesel generators.



View of the electricity supply And the back up generator
Source: Authors, 2025

Due to occasional power outages in Nairobi, many residents and businesses in Kilimani supplement their electricity supply with:

- Solar energy systems, often installed on rooftops.

- Backup generators, especially in larger residential complexes and commercial buildings.

- Battery storage systems to store solar or grid electricity for use during outages.

- When designing for Kilimani, it's essential to integrate provisions for alternative energy sources like solar and backup systems to ensure reliability.

Waste management

Residents of Kilimani, Nairobi, primarily manage their waste and sewerage through the following systems:

1. Sewerage System

• **Nairobi City Water and Sewerage Company (NCWSC):** Most of Kilimani is connected to the Nairobi sewer network, which channels waste to the Dandora Sewage Treatment Plant or the Nairobi Dam Plant.

• **Septic Tanks:** Some older buildings and private residences that are not connected to the main sewer system use septic tanks or digesters systems for waste management.

2. Solid Waste Management

• **Private Waste Collection Services:** Residents and property managers typically contract private waste collection companies, such as TakaTaka Solutions, BINS, or Kilimani Project Foundation, to collect and dispose of household and commercial waste.

• **City Council Services:** Although limited, Nairobi County occasionally provides waste collection services in Kilimani.

View the solid waste management systems in impala club
Source: Authors, 2025

Stormwater management

- Due to Kilimani's relatively flat terrain, stormwater management can be challenging. The area relies on Nairobi's drainage systems, but private developments are encouraged to implement additional measures.

Challenges with Flat Terrain

- Water Ponding: The flat terrain makes it difficult for water to flow quickly into drains, often causing water to pool during heavy rains.
- Flooding Hotspots: Areas with poor drainage infrastructure or blocked drains become flood-prone.

View the storm water management system.
Source: Authors, 2025

Legend

Electricity

Wastewater management

Telecom

Stormwater management

Noise

Impala grounds site
Source: Author (Amino), 2025

Telecom

Residents of Kilimani, Nairobi, access the internet through a variety of service providers, offering both fiber-optic and wireless connections. Kilimani is a well-connected area, making it a hotspot for high-speed internet access. Here are the main sources:

Residents of Kilimani, Nairobi, access the internet through a variety of service providers, offering both fiber-optic and wireless connections. Kilimani is a well-connected area, making it a hotspot for high-speed internet access. Here are the main sources:

View of the telecom connection near impala club
Source: Authors, 2025

SENSORY

- The only sources of noise is from the Ngong road.
- There is no bad odour in the site.
- Create interesting views within the site.

RESPONSES

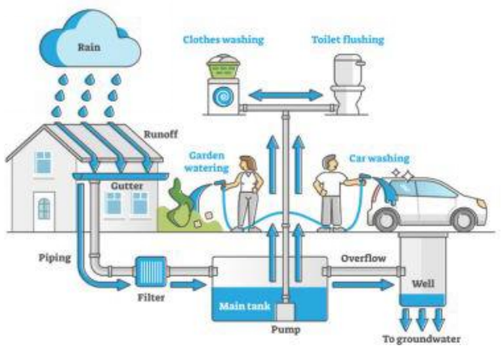
Water Supply

1. Install Boreholes: Where feasible, incorporate boreholes into commercial buildings to reduce reliance on inconsistent city water supply.

2. Rainwater Harvesting: Design buildings with rainwater harvesting systems, including storage tanks, gutters, and filters, to utilize seasonal rainfall.

3. Water Storage: Incorporate large water storage tanks (underground or rooftop) to ensure a steady supply during shortages.

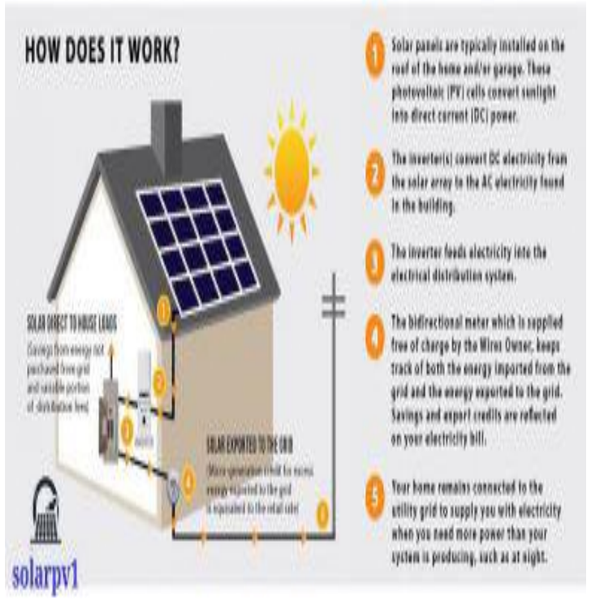
4. Efficient Plumbing Fixtures: Use low-flow fixtures, dual-flush toilets, and water-saving appliances to reduce water wastage.



Rainwater harvesting
Source: Grand designs magazine

Electricity Supply

1. Solar Energy Systems: Design rooftops to accommodate solar panels and include inverters for efficient energy use.



Solar panels
Source: solarpv1

2. Backup Power Solutions: Include provisions for backup generators or battery storage systems in building designs, especially for high-demand areas like commercial buildings or high-rise apartments.

3. Energy Efficiency: Use energy-efficient lighting (e.g., LED) and appliances to reduce power consumption.

4. Smart Energy Management: Incorporate smart grids or energy monitoring systems to optimize electricity use and manage power outages effectively.

Backup generator
Source: Generators Direct

Waste Management

1. Integrated Waste Separation: Include dedicated spaces for waste separation and recycling in buildings, with labeled bins for organics, recyclables, and general waste.

2. On-Site Composting: Encourage on-site composting for organic waste in residential and commercial projects.

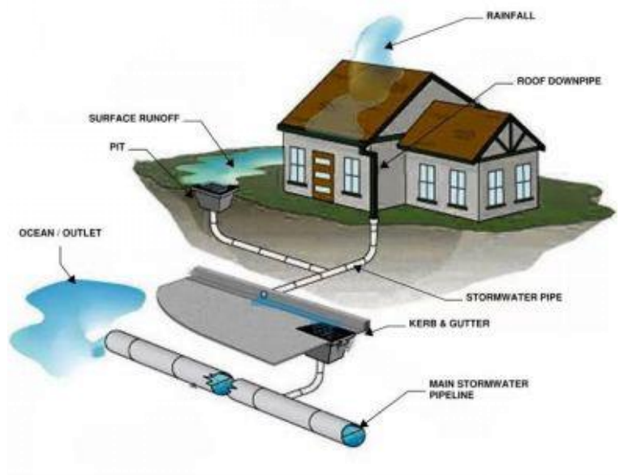
Composing on site
Source: www.carryoncomposting.com

3. Sewerage Systems: Ensure new developments are connected to the Nairobi sewer network where possible. Where not feasible, design septic tanks or biodigester systems to modern environmental standards.

4. Collaborative Waste Plans: Work with private waste collectors to establish efficient and sustainable collection schedules and routes for the development.

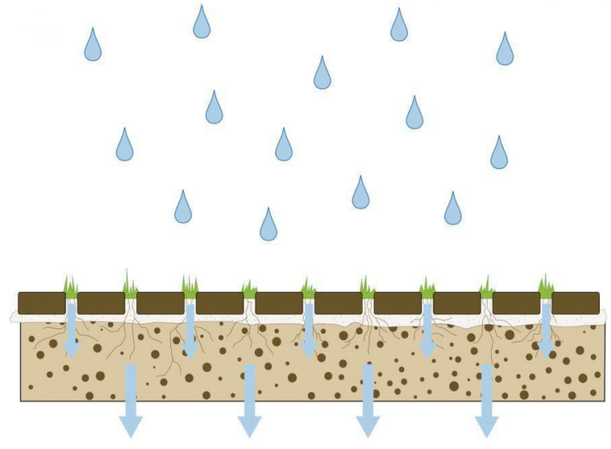
Challenges with Flat Terrain

1. Stormwater Management Systems: Incorporate well-designed stormwater drainage systems, such as underground drains and retention ponds, to manage excess rainwater.



Stormwater management plan
Source: Prime Conulting Engineers

2. Permeable Surfaces: Use permeable materials for pavements and parking areas to enhance water infiltration.



3. Green Roofs and Bioswales: Design green roofs and bioswales in landscapes to retain water and reduce surface runoff.

4. Maintenance Provisions: Schedule regular inspection and maintenance of drainage systems in project plans to ensure functionality during heavy rains.

SITE ZONING AND REGULATIONS

The Impala Grounds is located on Ngong Road. Under zoning regulations established in Nairobi, Ngong Road in Zone 4 and is zoned for mixed use and includes:

- Commercial Offices:Property utilized for business activities.
- Residential Apartments:Residential property for multiple families.
- Professional Offices: Buildings occupied by professionals such as doctors, lawyers, and consultants.
- Light Industrial Use:Industries with small effects on the surrounding environment.

The recommended building heights for the zone, in Nairobi's rezoning and development plan, are as follows:

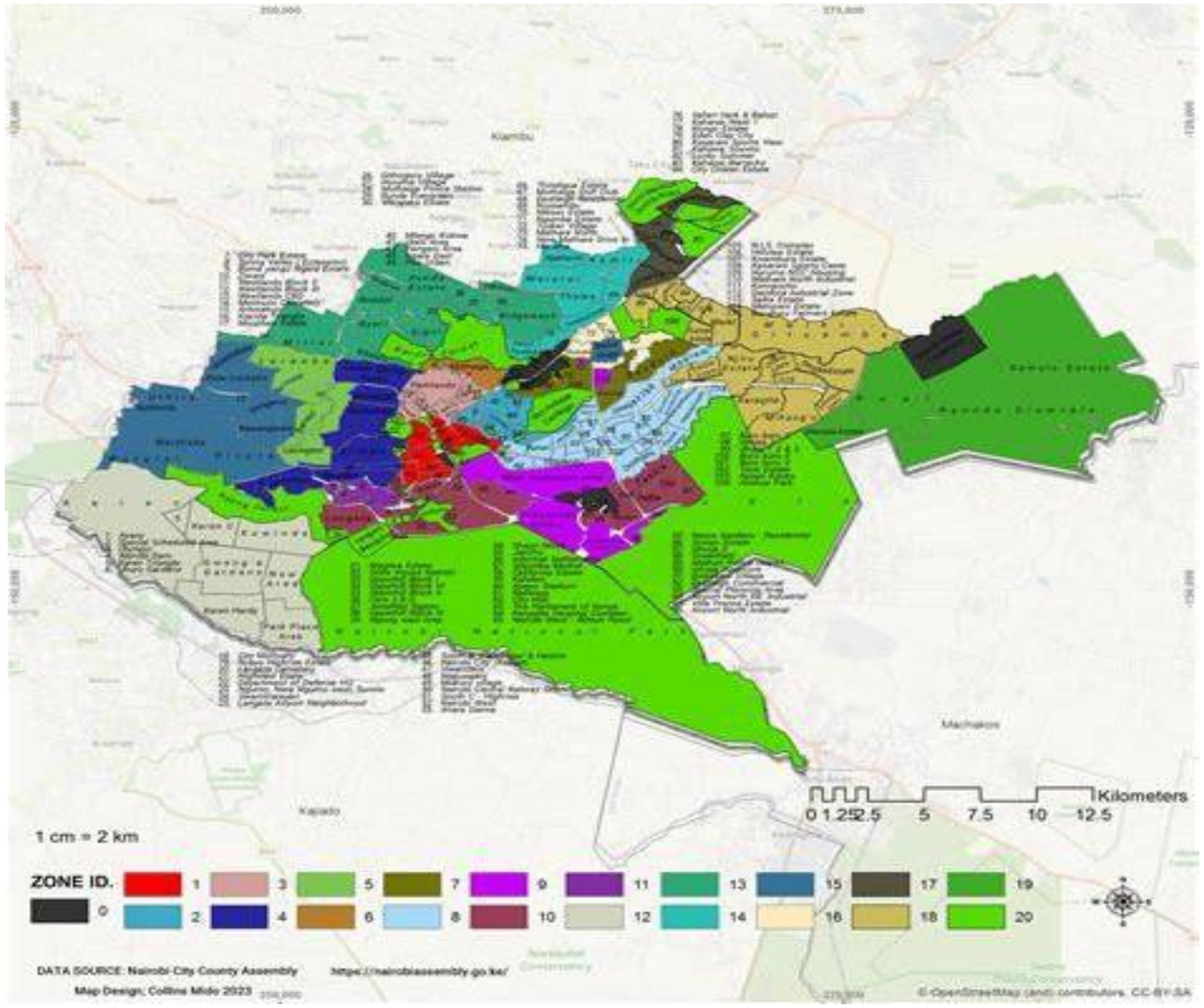
4 storeys:Within 3 kilometers of State House, Lower Spring Valley, and areas near Mathare River.

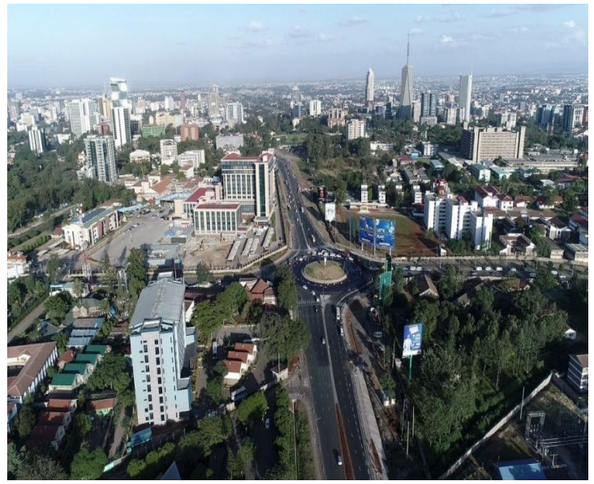
10 storeys: Woodley, Kabarnet Gardens, Joseph Kangethe Estate, Ayany Estate, and Kapitei Gardens.

15 storeys: Kileleshwa and Kilimani between Riverside Drive, Dennis Pritt Road, and Oloitoktok Road.

16 storeys: Areas between Waiyaki Way, Riverside Drive, Ring Road Westlands, and Mahiga Mairu Avenue.

25 storeys: Ngong Road.





Example Commercial Office and Property utilized for business activities in Nairobi zone 4 in Aerial View

Example of Residential Apartments in Ngong Road

ZONE	SUBZONE	AREA/LOCATION	BOUNDARY EXTENT	PLOT RATIO	GROUND COVERAGE	NO. OF LEVELS /SKYLINE	MINIMUM PLOT SIZE		DESCRIPTION
ZONE 4	Boundary	Westlands Redhill Link Road – Waiyaki Way – Ring Road Parklands – Mathare River – Ngong road – Joseph Kangethe road							
	4 A	Lower Spring Valley	Mathare River, Westlands Redhill Link Road, Waiyaki Way and Ring Road Parklands	240	60	4	0.05	500	Mixed Development: Residential, Commercial Offices, Professional Offices
	4 B	Muthangari	Area between Waiyaki Way, Riverside Drive, Ring Road Westlands and Mahiga Mairu Avenue	1200	75	16	0.05	500	Mixed development: commercial, Residential, professional offices
	4 C	Kileleshwa (s & u)	Area between Riverside Drive, Dennis Pritt road and Oloitoktok road, -Areas of radius of 3 Km to State House to be limited to – 4 levels	1500	75	15	0.05	500	Mixed development: Commercial, Residential, professional offices
	4 D	Kilimani (s & u)	Area between Argwings Khodek and Ngong Road -Areas of radius of 3 Km to DoD to be limited to – 4 levels	1500	75	15	0.05	500	-Mixed Development: Residential, Commercial Offices, Professional Offices, Light industrial use
	4 E	Ngong road area	First row along Ngong Road from Valley Road to Dagoretti Junction	1850	75	25	0.05	500	Mixed Development: Commercial Offices, Residential, Professional Offices, Light industrial use
	4 F	Woodley: Kabarnet gardens, Joseph Kangethe Estate, Ayany Estate, Kapitei Gardens	Area between Ngong road area, Muchai Drive, Kibera Station road and Joseph Kangethe road	750	75	10	0.05	500	Mixed use development: Residential, Commercial Offices, Professional Offices & Institutions

BUILDING CODES AND STANDARDS

The National Building Code 2024 contains important regulations applicable across the board, with specific applicability to the Impala Grounds Site. These include :

- **Structural Integrity**:
  Seismic design codes must be adhered to by all buildings to resist earthquakes as Kenya is located in a seismically active area.

https://www.minitab.com/content/dam/www/en/uploadedfiles/documents/resources/3-common-construction-challenges-that-minitab-can-solve.pdf

- **Fire Safety**:

Fire escape routes, sprinklers, and adequate ventilation must be provided. Adherence to the Occupational Safety and Health Act (OSHA) must be met by any commercial or mixed-use building.

https://www.amazon.com/Fiery-Free-Fire-Extinguisher-Mount/dp/B0CP28SJ37

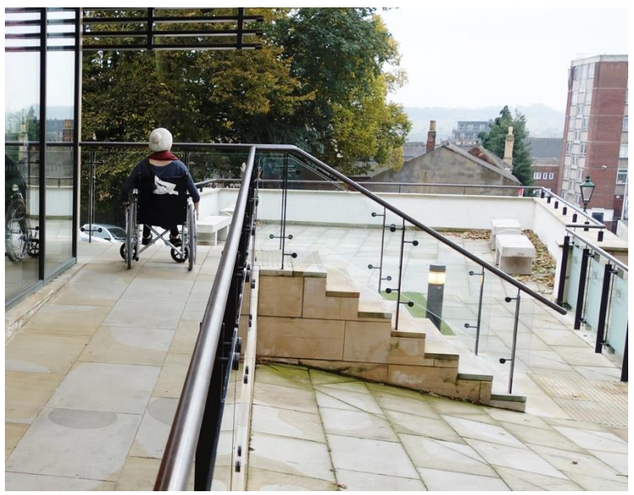
- **Sustainability:**

Use of green materials and design. Integration of green building components, including rainwater harvesting and recycling of greywater.

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.researchgate.net%2Ffigure%2FDimensions-of-sustainability-of-green-buildings_

- **Accessibility:**

Designs should provide universal accessibility for the disabled, as per the Persons with Disabilities Act, 2003.

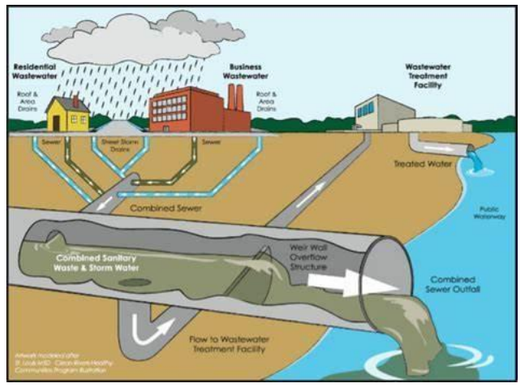


https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.archdaily.com%2F364518%2Fthe-architect-and-the-accessible-city-the-prize-winning-essay&psig=AOvVaw1zwOWUb5TF

ENVIRONMENTAL STANDARDS

As Impala Grounds have potential environmental significance Environmental Impact Assessment (EIA) report approved by National Environment Management Authority (NEMA) is a prerequisite before development. Other Environmental standards include :

- **Stormwater Management:**
  Installation of stormwater drainage systems to avoid flooding on Ngong Road and surrounding areas.



https://www.google.com/url?sa=i&url=https%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2FFile%3ASewage_Redirect_flow.jpeg&psig=

OTHER SITE SPECIFIC CONSIDERATIONS INCLUDE :

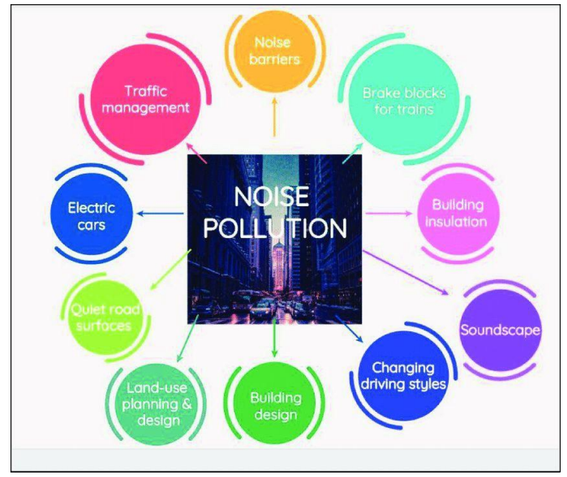
- **Preservation of Existing Vegetation:**
  Where the site has mature vegetation, environmental preservation provisions will be necessary in development plans.

- **Landscaping standards**, e.g., planting native vegetation, might be required.

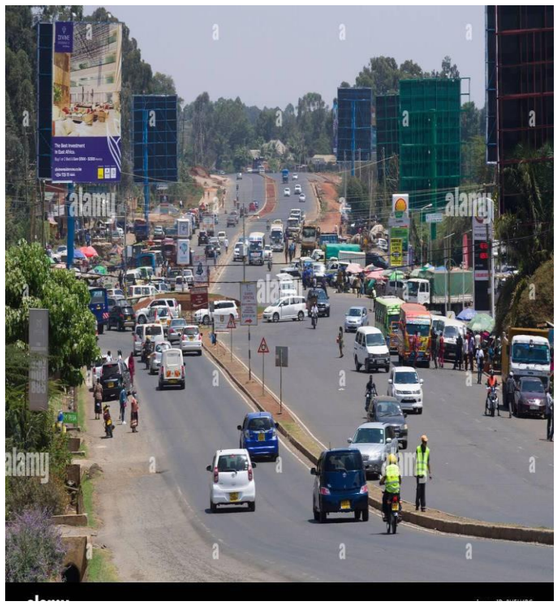
- **Proximity to Sensitive Sites**:Where the Impala Grounds are within 3 kilometers of State House Nairobi, development height and activities could be restricted to 4 storeys due to security and airspace reasons.

- **Traffic Impact Assessment**:As the site is on Ngong Road (a major arterial road), a Traffic Impact Assessment (TIA) must be done to ensure that the development does not interfere with traffic flow or overload existing infrastructure.

- **Control of Noise Pollution:**
  Construction work should adhere to Environmental Management and Coordination Act (EMCA) noise controls.



Ten ways to reduce noise pollution based on [5]. | Download Scientific Diagram



Example of traffic along Ngong Road

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JERICHO PLAYGROUND – GROUP 3 PERSPECTIVES

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HISTORY OF JERICHO

Ofafa Jericho is a neighborhood located in the Eastlands area of Nairobi, Kenya, within Makadara Constituency. Established in the 1950s, it was part of urban planner Erica Mann's efforts to develop housing estates in Nairobi during the 1940s and 1950s. The estate was designed with two-story maisonettes equipped with electricity, internal water supply, and sanitation facilities, surrounded by ample open spaces. Originally intended to accommodate around 10,000 residents, the population has since grown to approximately 50,000, leading to challenges such as overcrowding and inadequate water and waste management systems.

The name "Ofafa" honors Ambrose Ofafa, a prominent Kenyan politician who received a Colonial Service award in the 1953 Coronation Honours list and was tragically murdered in November of the same year.

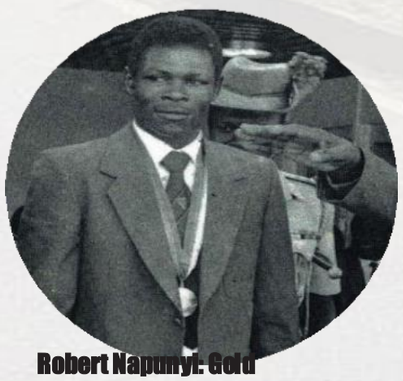
The term "Jericho" reflects the estate's connection to the Israeli government, which assisted in its construction, drawing a parallel to the ancient city of Jericho. Ofafa Jericho is characterized as a low-income, high-density area. The housing units are uniform double- story structures, each accommodating two tenants—one on the ground floor and another on the upper floor. Due to economic constraints, many

Source of all pictures-Nairobi city council houses at Jericho estate built in 1961 *Source: https://cdn.standardmedia.co.ke/images/sunday/yzqhudwha2ynctsj60bcea4b7fc2f.jpg*

Ambrose Michael ofafa: politician

Kisoi Munyao

Bildad Kaggia: Politician



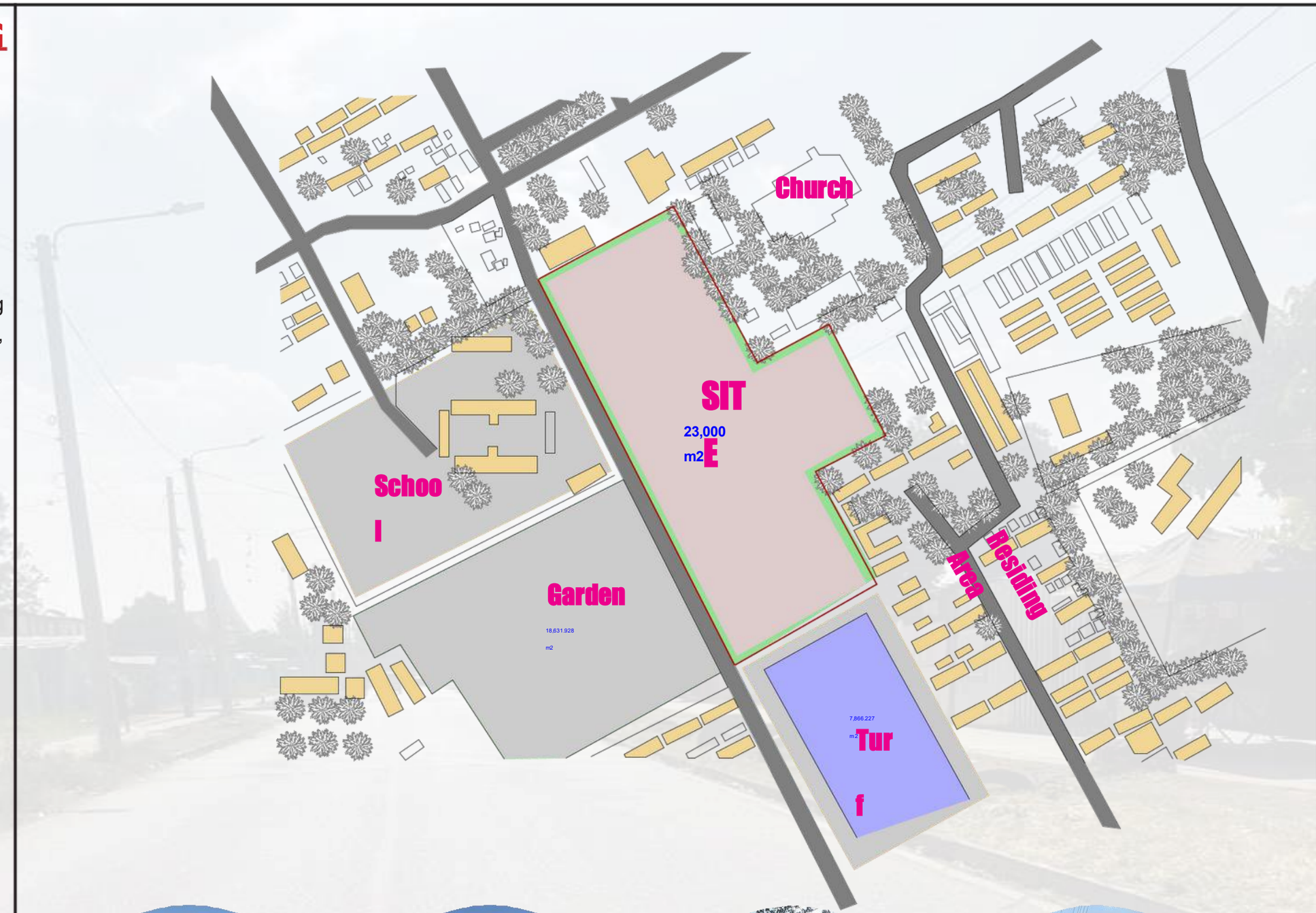
Robert Napunyi: Gold WRESTLER

SITE SURROUNDING

residents rent out portions of their homes, with tenants typically paying between KSh.2,500 and KSh.3,000 per month. The average monthly income for residents is around KSh.20,000, with daily food expenditures averaging KSh.100. Employment opportunities in the area include cottage industries, short-term contracts in the transport sector, and vending of fast-moving consumer goods. Additionally, local youth have initiated ventures such as garbage collection and automotive repair services.

The community is diverse, comprising individuals from nearly all Kenyan tribes. The predominant language spoken is Sheng, a blend of English, Swahili, and various local dialects. The average age of residents is 35 years. Children in the community attend government-funded city council schools, and improvements in healthcare services have led to significant reductions in health concerns like HIV/AIDS and infant mortality.

Notably, Ofafa Jericho has been home to several prominent figures, including Kisoi Munyao, who hoisted the Kenyan flag on Mount Kenya during the country's independence celebrations on December 12, 1963, and Robert Napunyi Wangila, Kenya's only Olympic boxing



Tuff Play Area

Church Buildings

Old Goverment Houses

Shopping Al Oas

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SITE ACCESSIBILITY

-THE SITE IS SERVED A RICH WELL MAINTAINED NETWORK OF AC- CESS ROADS HENCE ACCESS BEING CONVNIENT. -MOST OF THE NETWORK ROADS HAVE LIGHT TRAFFIC WITH CON- VINIENT TERMINALS NEAR THE SITE . -THE SITE IS ALSO 7.2 KM FROM NAIROBI CBD AND ATMOST 30 MIN DRIVE VIA JOGOO ROAD.

LANDMARKS

1 .JERICHO SDA CHURCH-3MIN WALK 2. OFAFA JERICHO HIGHSCHOOL -2MIN DRIVE -11 MIN WALK 3.JERICHO HOSPITAL -2 MIN DRIVE -7 MIN WALK 4.CAMP TOYOYO -2 MIN WALK 5 .JERICHO MARKET -2 MIN DRIVE -11 MIN WALK 6. CHARLES NEW METHODIST CHURCH -2MIN DRIVE -7MIN WALK

ROAD HIERACHY

SECONDARY ROADS TARMAC ROADS
-JOGOO ROAD

-OUTERING ROAD
TERTIALY ROADS TARMAC ROADS

-NILE ROAD
-CHARLES NEW ROAD

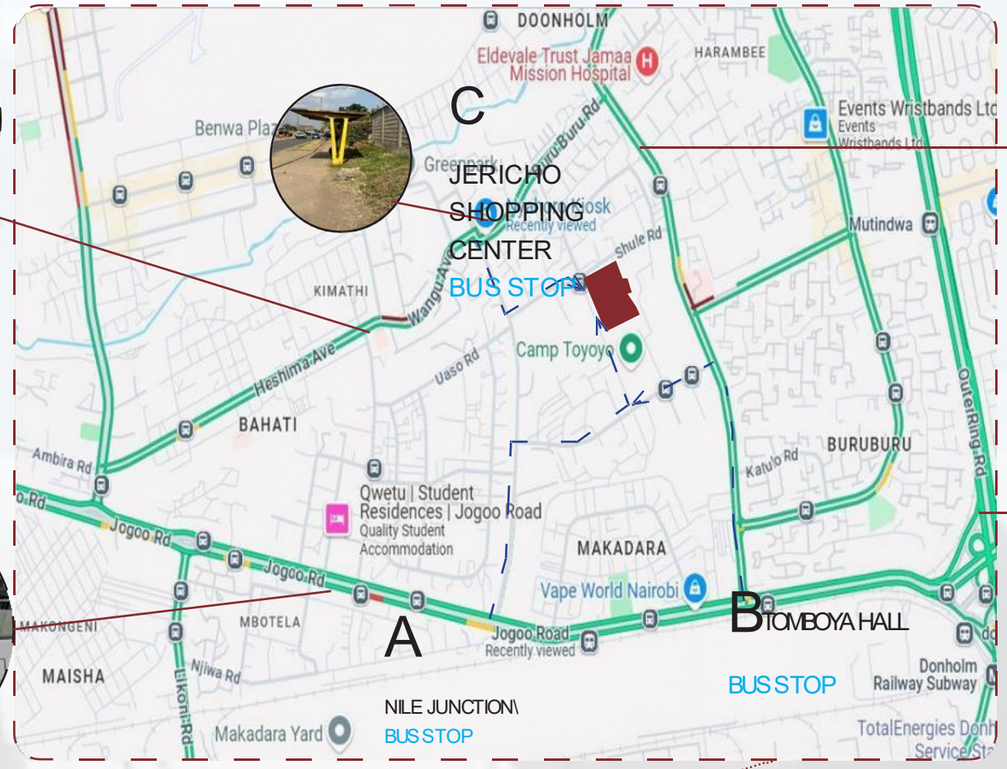
-SHULE ROAD
-HESHIMA ROAD

-BURUBURU ROAD
-RABAI ROAD

RESIDENCE ACCESS MURRAM ROAD

HESHIMA AVENUE

JOGOO ROAD



BURUBURU ROAD

RABAI ROAD

OUTERING ROAD

SHULE ROAD

NILE ROAD

CHARLES NEW ROAD

Source of images on this page are from members of group 3

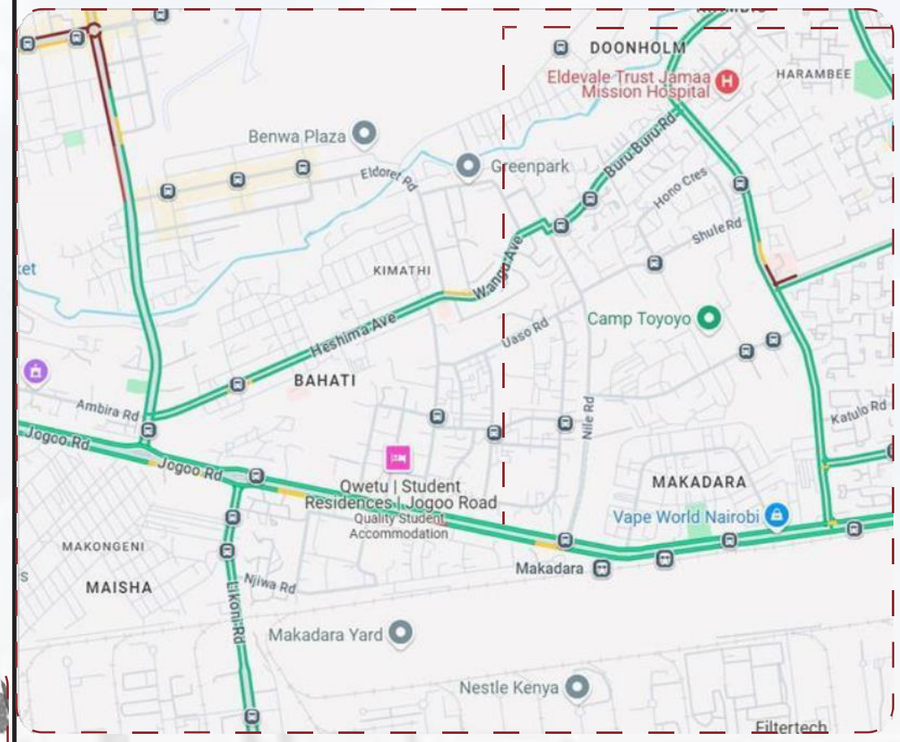
-ACCESS ROADS TO SITE

INCLUDE:

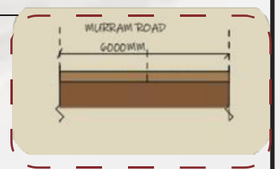
-NILE ROAD -CHARLES NEW ROAD
-SHULE ROAD -HESHIMA ROAD
-BURUBURU ROAD -RABAI ROAD
RESIDENCE ACCESS MURRAM ROAD
-HONO CRES ROAD

ASPECTS TO CONSIDER

-TRAFFIC FLOW -PRESENCE OF TERMINALS -SETBACK FOR UTILITIES
-STORM WATER DRAINAGE
-CONVINIENCE FOR ALL USERS



HONO CRES ROAD



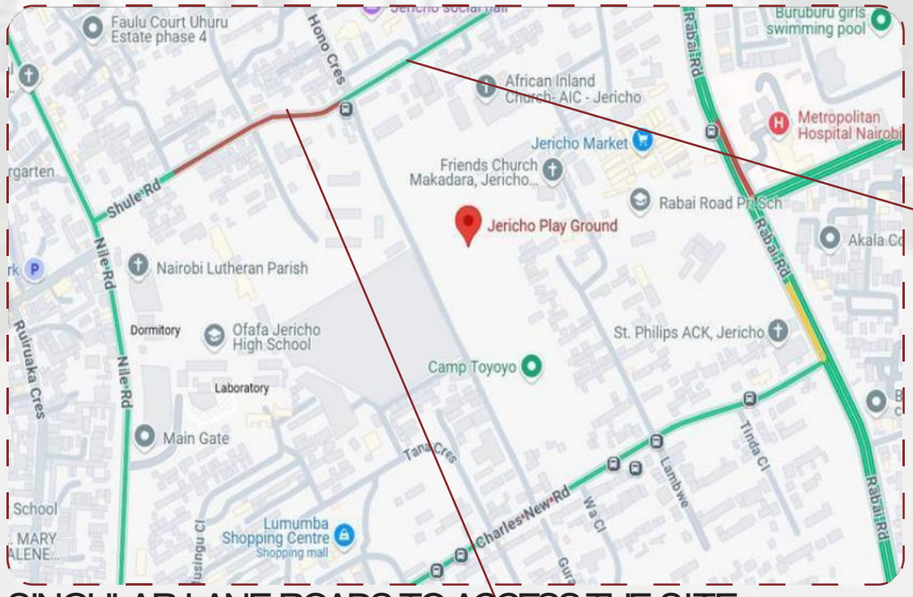
SECTION

CHARACTERISTICS

-LIGHT TRAFFIC
-DIRECT ACCESS TO SITE

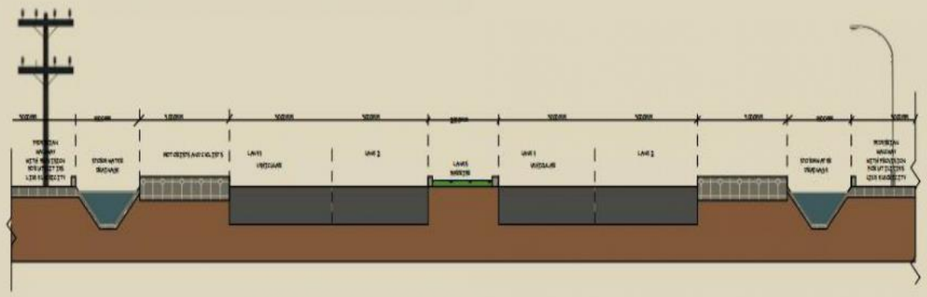
-LACKING STORMWATER DRAINAGE
-LACKS DISTINCTION BETWEEN

PEDESRTIANS AND MOTORISTS
-MURRAM SURFACE



SINGULAR LANE ROADS TO ACCESS THE SITE

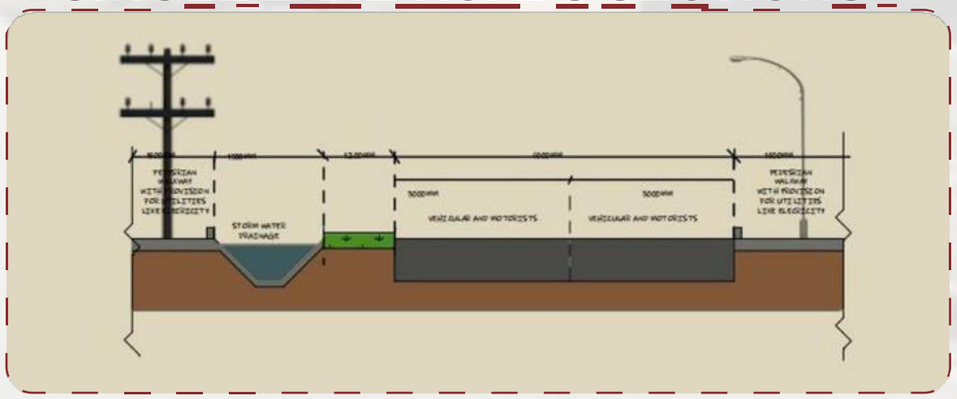
-NILE ROAD -CHARLES NEW ROAD -SHULE ROAD -HESHIMA ROAD
-BURUBURU ROAD -RABAI ROAD



JOGOO ROAD SECTION

CHARACTERISTICS -LIGHT TRAFFIC -CONVINIENT TERMINALS TO SITE -EFFECTIVE STORMWATER DRAINAGE -CONVINIENT FOR BOTH PEDESRTIANS AND MOTORISTS -

SINGLE LANE ROADS SECTIONS



CHARACTERISTICS -LIGHT TRAFFIC -CONVINIENT TERMINALS TO SITE -EFFECTIVE STORMWATER DRAINAGE -CONVINIENT FOR BOTH PEDESRTIANS AND MOTORISTS -

Source of images not indicated on this page are from members of group 3

INVENTORY

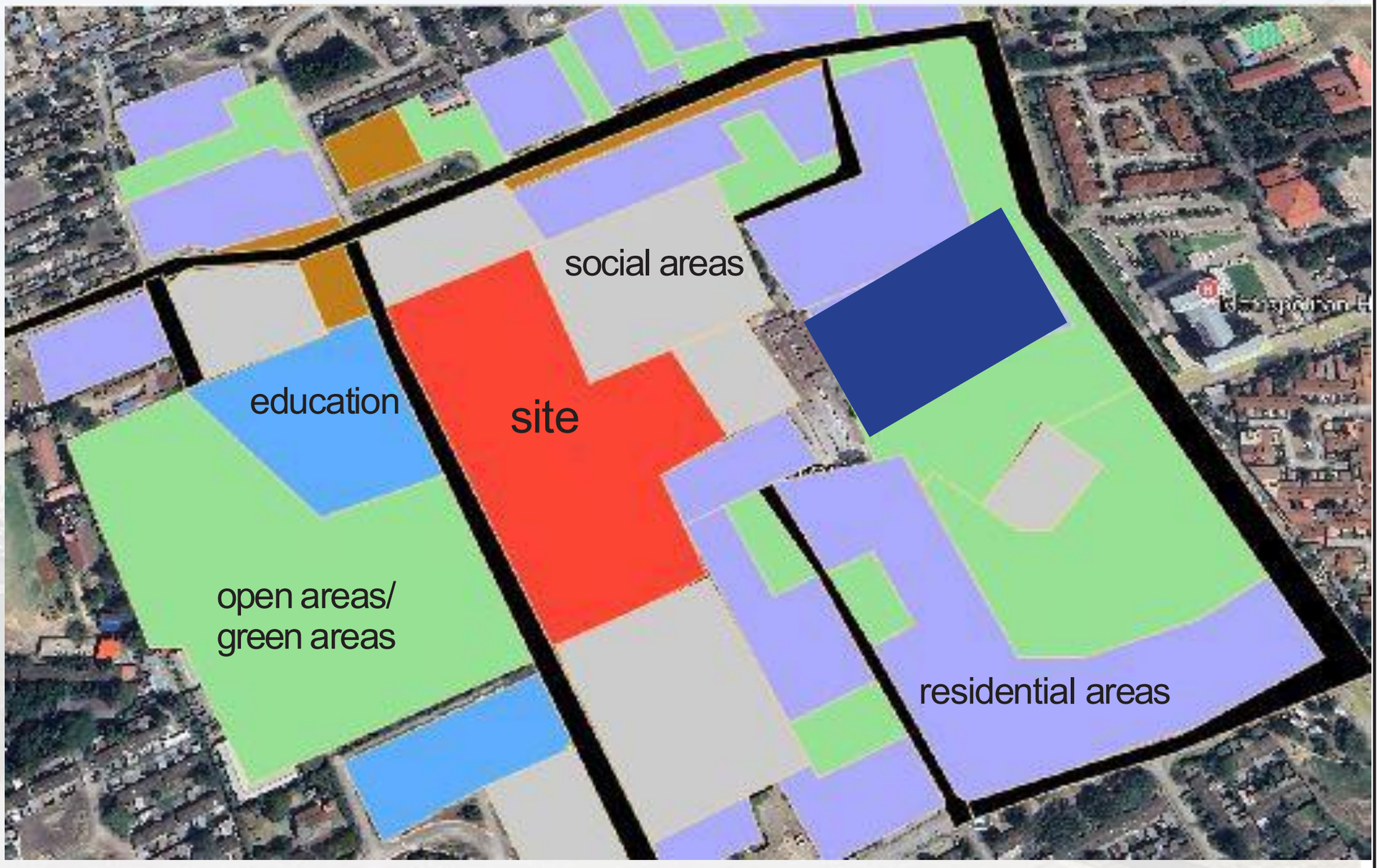
Most of the neighborhood is divided into

1. residential areas 2. social areas
   - variety of churches -
   playgrounds - open green
   spaces within the
   neighborhood
   - market
   -turf
3. administrative area
   - resource centre
4. educational facilities
   -Schools

ANALYSIS

- Most of the sorrounding spaces are for social use by everyone in the community - there are open areas or spaces for social gathering , with most of these spaces in between residential areas to break monotony .
- ideally, these spaces were meant to act as green areas and playgrounds for the sorrounding families
- there are a few commercial areas mostly local kiosks just off the road.
- there is only one administrative space around the site, which is the resource centre positive: most of the zoning and land uses are defined and organised, mostly targeting social cohesion
negative: designing should follow the already existing pattern, to create a user friendly space that most of the people will be comfortabe using.

EXISTING PROPERTY ZONING AND LAND USES



RESPONSES

- The playground acts as an open space for the sorrounding buildings and their activities, designing in the space would require one to incorporate something that will attract people of all ages and at any time of the day, to create that social cohesion principle
- designing would need one to conform to the existing land uses to avoid creating a design out of context

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-INVENTORY

Most of the buildings that can be used as landmarks are the sorrounding churches along shule road. - they are the main outstanding features that can help with the direction to the site. - most of the paths branching from shule road are headed straight into the residen- tial neighborhoods

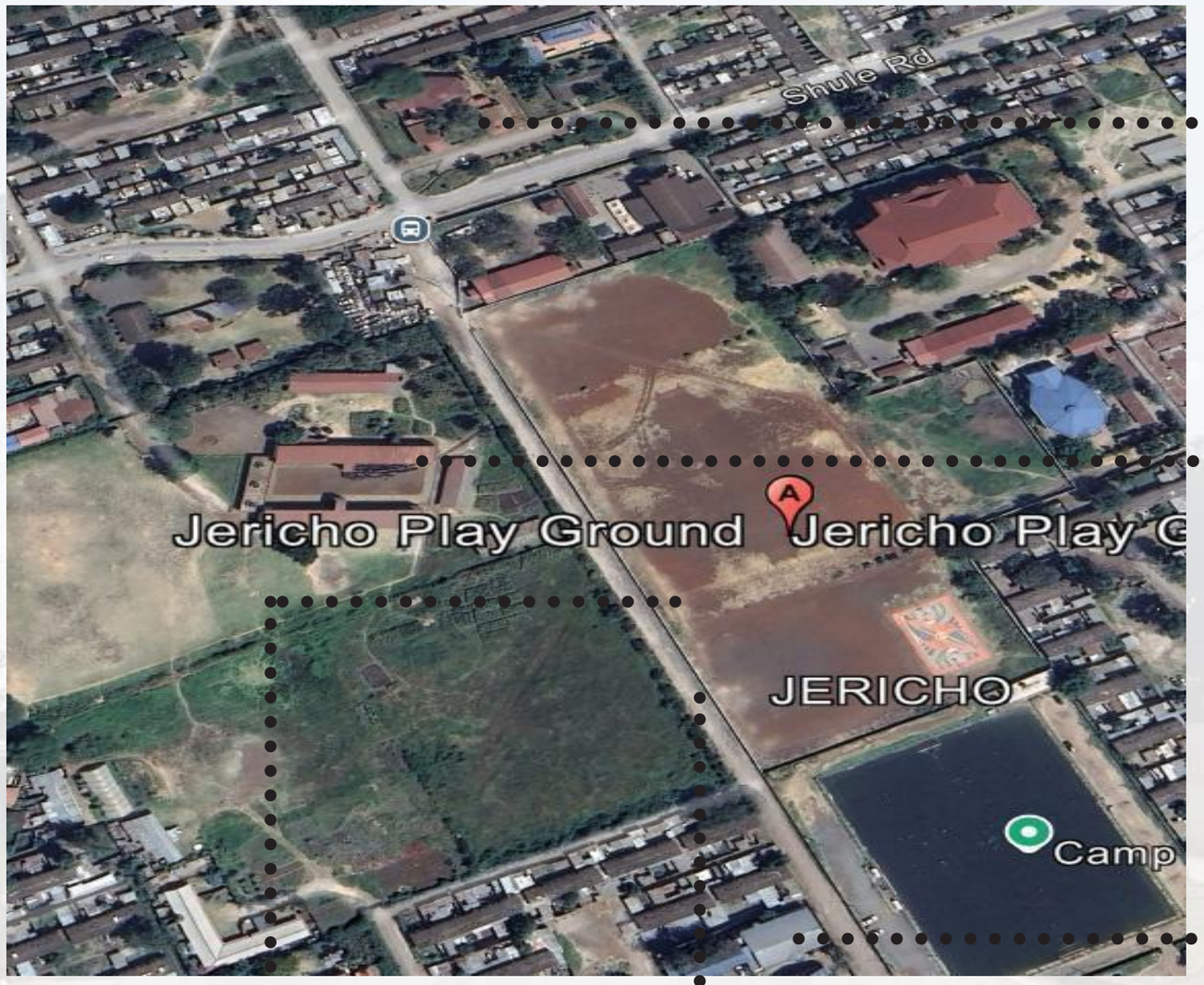
ANALYSIS

negative - the sorrounding buildings are almost not outstanding enough to help in di- rections as landmarks. they are almost the same heights as existing structures around, hence dont stand out much. -as the site surrounding has only one road of access, the one that passes in- front of it, and it is sandwiched among other social uses, it becomes hard to identify the location at first positive - the present paths mostly lead into neighborhoods, avoiding interference with the site. the site

RESPONSES

-Maintain the existing road networks as they work to ensure trespassers from the site dont go into the neighborhoods, hence there will be no interference

LANDMARKS, MOVEMENT PATTERNS AND PATHS



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BUILDING HEIGHT, STYLE, PATTERN, MATERIALS AND SUN SHADING

Institutional buildings like the churches which sorround the site are gerenally built with mordern(concrete and brick material) and some touch of classical style(-columns and symmetrical balance) • Their heights span between 7-9m. excpt the Jerocho Baptist Church whose tower spans upto 12m high

the structure consists of gabbled roofing, concrete and stone block materials.

the long facade bears large case- ment windows to enhance prop- er lighting

its als bears a tower whose height span upto 12m high.

a corrugated iron sheet was also used to enhance the entrance.

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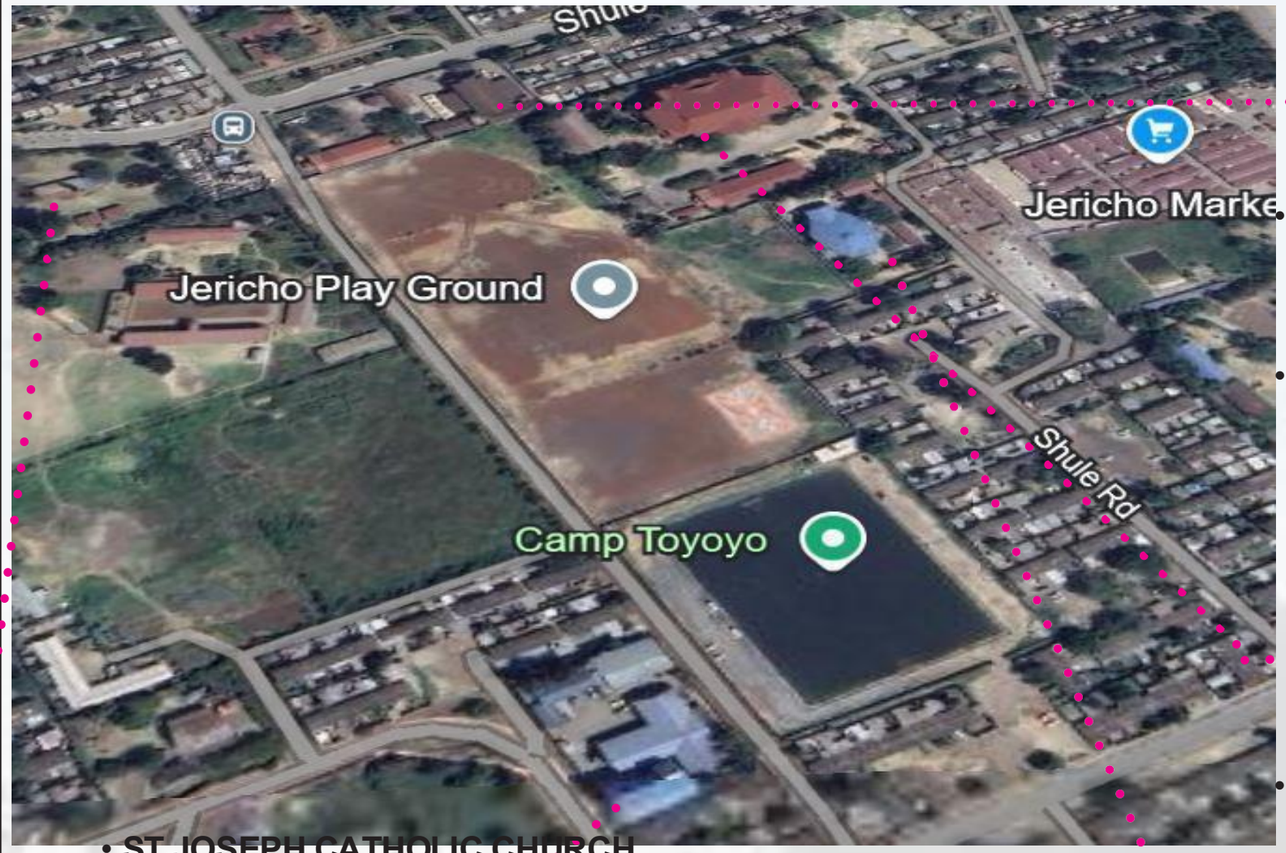
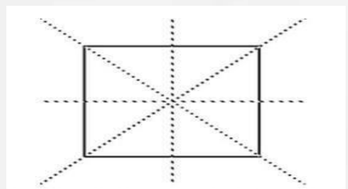


• **ST JOSEPH CATHOLIC CHURCH**

- consists of gabbled roofing, concrete and stone block
- exterior
- .vertical projection around the building face and in between vertical louvered window
- the used of symmetrical balance to achieve beuty

RESPOSES



- posibble application of symetrical balance in the proposed proj-
- the building height will choose to stick to the obtainable height requirement of building in this area
- the design will encoperate the use of modern and local material • proper ventilation and lighting to be applied in the project unless for areas which might not need too much light to avoid damaging objects for exhibition(in museum or exhibition hall)
- possible use of clerestory window for perhaps museum

• **JERICHO SEVEN DAY ADVENTIST**

- consists of gabbled roof, concrete and bricks exterior.
- large vertical windows with stained glass transoms and clerestory windows for maximum lighting.
- tw emerging column to serve the entrance porch into the church

• **AFRICAN INLAND CHURCH A.I.C**

consists of gabbled roof, concrete and bricks exterior.

- vertical window arranged at the same level and also a large clerestory window for lighting
- double standing columns at the entrance of the building
- NE and SW building orientation and likewise trees to serves as shading
- the building is also symmetricly balanced

• **FRIENDS CHURCH MAKADARA,**

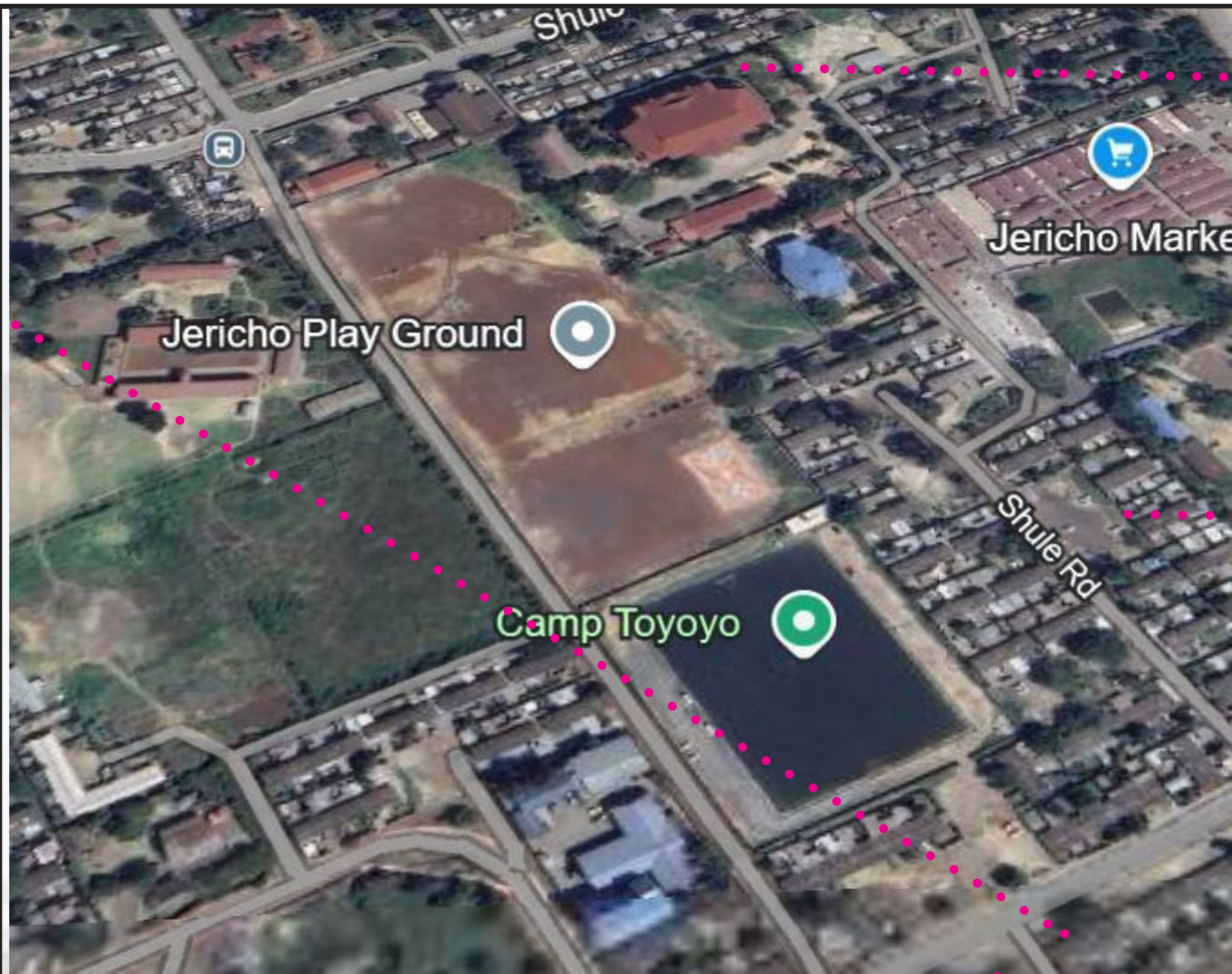
- consists of hipped roofing partly hidden by approximately 800mm parapet walling.
- brick and concrete exterior vertical fins
- inbetween vertical windows for shading and aestetical value
- large horizontally arranged windows to enhance sufficient lighting
- sufficient amount of tree to help in shading

BONGALOW

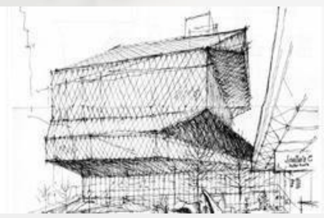
- The building consisits of a flat roofing with a small chmey projection for the release of hot air from the building
- horizonal arrangement of apartment with projected and recessed movement on the facade.
- a sense of horizontality in the arrangement of windows
- casement windows to enhance proper lighting and ventilation.
- extension use of metal door and protectors for security reasons
- colours are also used to ensencuate various apartments

Some building also bear artistic painting and graffiti as a way of expressing beuty and culture

SECURITY



RESPOSES



https://seattle.urbansketchers.org/2011/01/seattle-public-li

https://urbaneez.art/magazinef/rom-the-street-to-the-museum - the-journey-of-urban-art

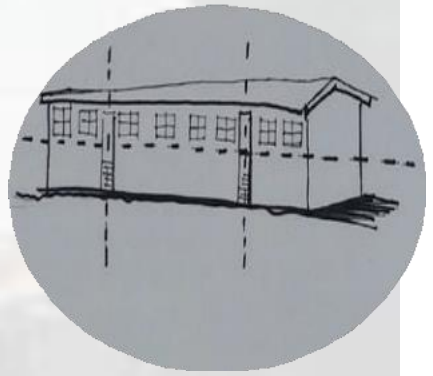
- Tree and proper landscaping to enhance good temperature,cooling and air circulation
- the building may choose to digress from the regular block form pattern to more irregular one
- museum or exhibition hall will encoperate paintings or graffiti display as a way of expressing the culture of the environment
- perimeter all to the site should be changed to a see through one

https://www.landscapingnetwork.com/trees/grouping.html

https://www.informedsystemsltd.com/clear-view-fence/

DOUBLE STOREY BUILDING

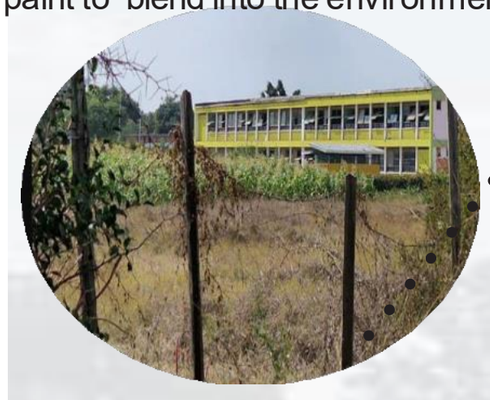
- consists of a blend of modernist and functionalist principle of design
- single rectangular forms
- concrete and brick exterior
- casement windows to enhance proper lighting and ventilation
- casement window arranged horizontally in a staight line(order and beuty)
- a sense of semmetory shown through the arrangement of windows in between the balco-



- NE-SW orientation of the biuding to shade it from sun
- abundance of tree which help in shading and cooling the sorroundings
- the use of corrugated iron sheet for roof indicating the need for security

Source of images not indicated on this page are from members of group 3

OFAFA PRIMARY SCHOOL -located north west side of the site -flat roof (hiding a skillion roof) -recessed window with vertical demacations for shading - large single hung window and louvred clerestory windows to serve lighting and ventilation -cream and lemon green paint to blend into the environment



JERICHO SOCIAL HALL - located north side of the site -consists of a skillion roof, flat roof and pyramid hipped roof -the windows consist of louvred vents, double hange and casement window arranged in a horizontal level - perimeter wall with perforations - cream and green paint to blend with the sorrounding

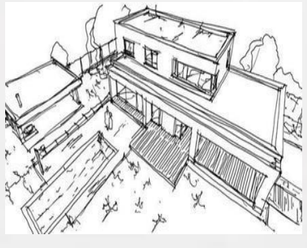
RESOURCE CENTRE - located north of the site - consisits of gable roof with chimney projections for ventilation - horizontally arranged casement win- dows - projected canopy of approximately 800mm -concrete and block exterior

OFAFA SECONDARY SCHOOL -western side of the site -concrete and brick exterior -large casement windows for ventila- tion and lighting - NE-SW orientation to shade build- ing from sun

ST JOSEPH PRIMARY AND SECONDARY SCHOOL-Gabble roofing -a seven story building(tallest building close to site) -concrete and brick exterior -large casement window for optimum lighting -elaborate stairways to the east side

CAR WASH AND STALLS/KIOSKS -corrugated ironsheet exterior -some tiny columns holding overhangs and shading -paintings to enhace beuty of the envi- ronment

RESPONSES



- encoperate the NE-SW building orientation to take care of sun rays
- the design will digress from the commom roofing pattern to a flat roof

Source of images on this page are from members of group 3

SURROUNDING ACTIVITES

GRAFITTI

~~Location: Gra~~ffiti can be found on vari- ous surfaces: Walls: Buildings, fences, and underpass- es. Public Transportation: Buses Graffiti in Jericho, Nairobi, is not legal These grafitti in the area is done by the youths ,groups ,and sometimes its an organised effort

Graffiti in Jericho is multifaceted with diverse meanings and interpretations. It serves as a platform for artistic expression, social commentary, and cultural identity. While some may view it as vandalism, others recognize its potential to beautify urban spaces and engage communities. A deeper under- standing of the motivations and messag- es behind graffiti art can help foster appreciation for this unique form of urban expression.

Themes: Common themes observed in

Jericho graffiti may include:
Social and Political Commentary: Ad-

dressing issues like inequality, pover- ty, and political corruption.

Cultural Identity: Celebrating Kenyan culture, history, and heritage.

Personal Expression: Artists using graffiti as a means of self-expression,

sharing their thoughts and feelings.

Responses

Designated Graffiti Walls: Creating designated spaces for legal graffiti can channel artistic energy and reduce vandalism on private property.

Community Engagement: Involving local artists and community members in the design and creation of public art proj- ects can foster a sense of ownership and reduce conflicts.

Education and Outreach: Raising awareness about the legal and social implications of graffiti can help dis- courage vandalism and promote re- sponsible artistic expression.

Supporting Legitimate Art: Encourag- ing and supporting legitimate street art initiatives can provide a platform for talented artists and contribute to the vibrancy of the neighborhood.

Source of images on this page are from members of group 3

CHURCHES.

There is a total of upto 3 churches surrounding the jericho playground.

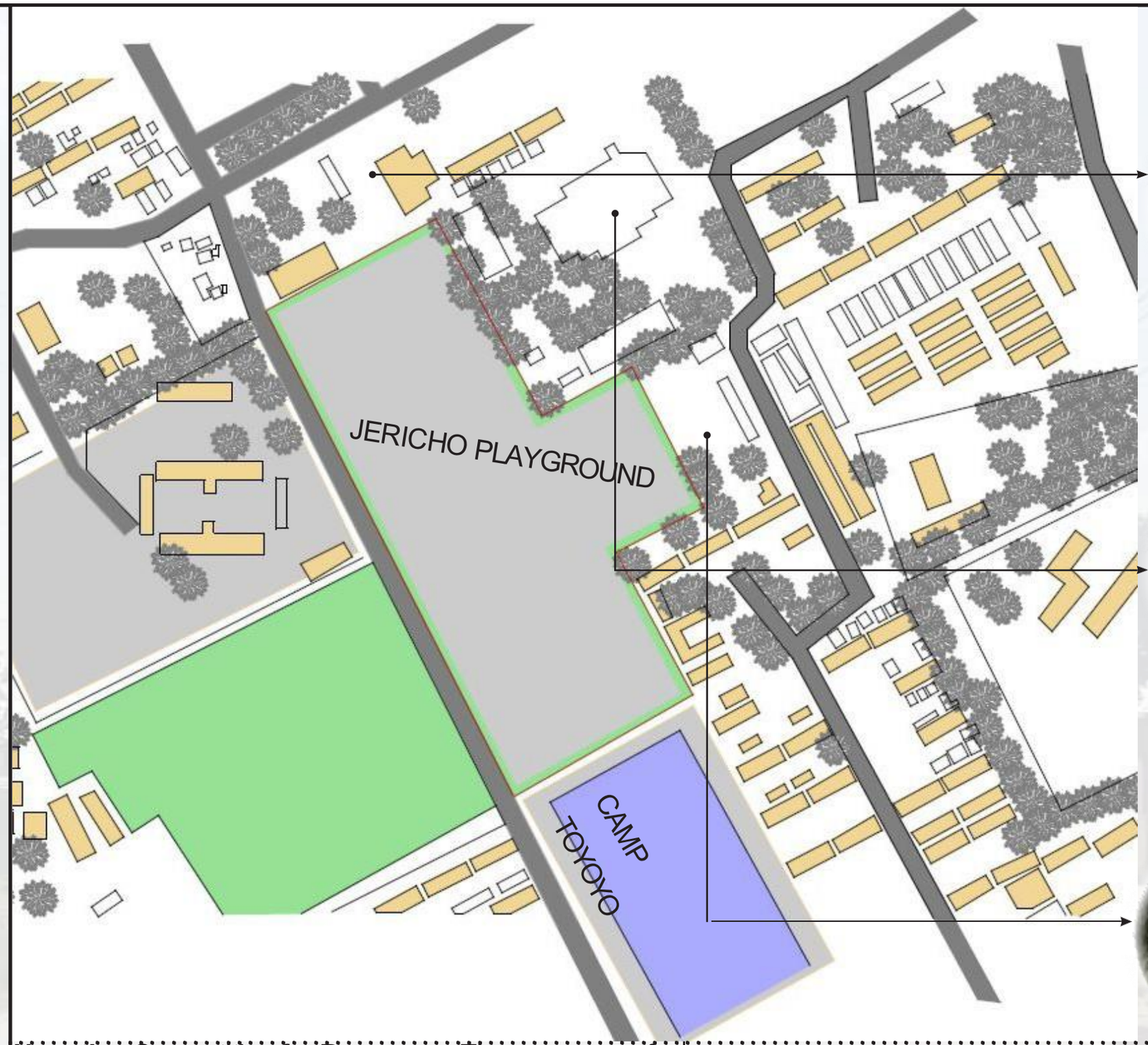
To the north-Jericho Seventh Day Adventist.

To the north east-African Inland Church- AIC To the east-Friends Church Makadara,

analysis. 1.Community Hubs: These churches act as community centers, offering spaces for social gatherings, youth programs, and other community activities. This can enhances the social fabric of the area and provide positive alternatives for young people.

2.Social Services: Many churches provide social services such as food banks, clothing drives, and counseling services, which can benefit the local communi- ty, including those who may utilize the playground.

3.Moral and Ethical Guidance: These churches provide moral and ethical guidance to young people in the commu- nity, promoting positive values and dis- couraging negative behaviors.



Jericho Seventh Day Adventist

African Inland Church- AIC

Friends Church Makadara,

Negative Competition for Resources: The presence of numerous churches increase competition for limited resources, such as funding for youth programs or community devel- opment initiatives.

Noise and Traffic: Church activities, such as services and events, generate noise and traffic, this impacts the peaceful enjoyment of the playground.

Land Use: Churches tend to have a say in the contruction around that area .

RESPONSES

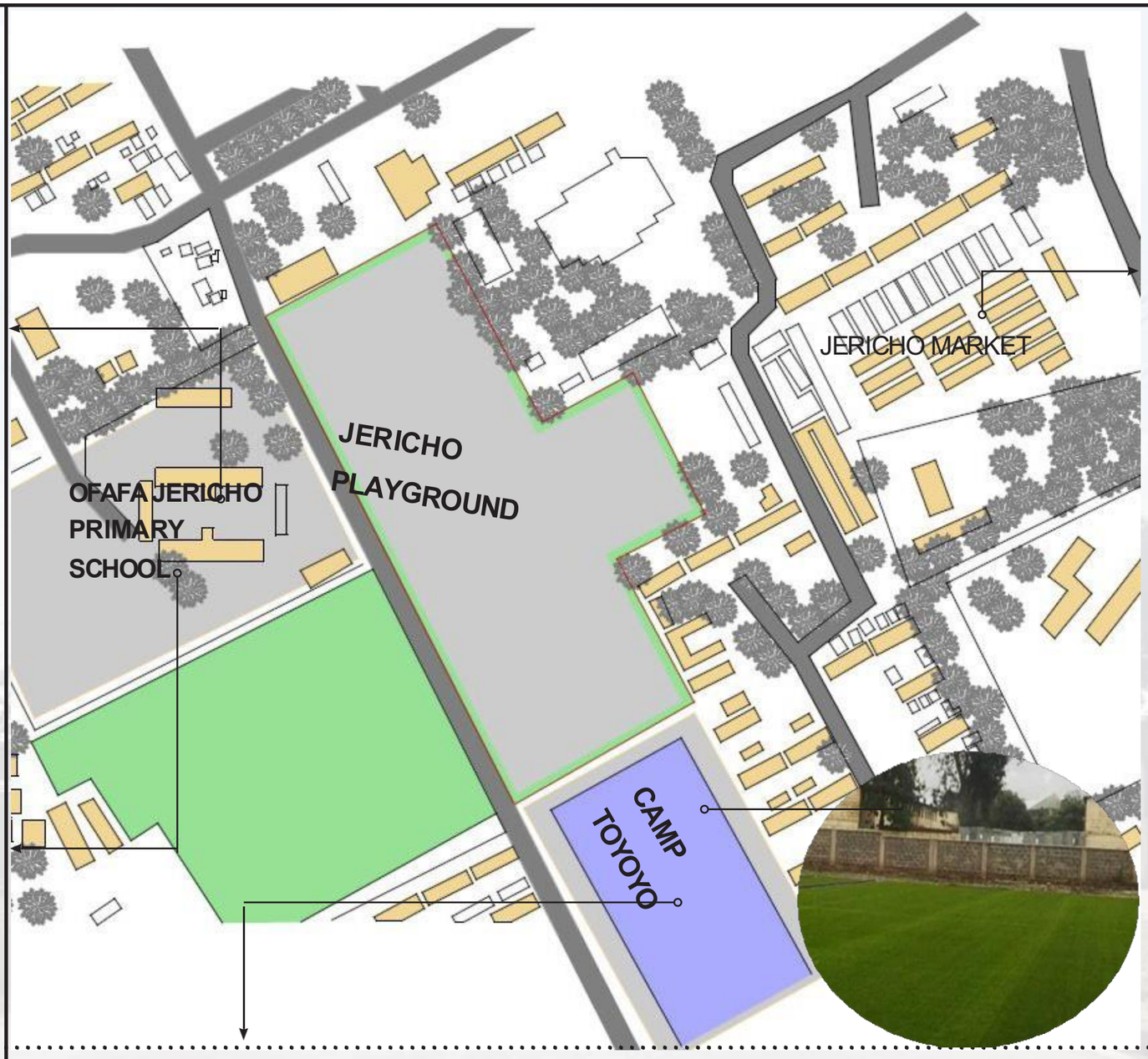
Partnership: Collaboration between churches, community organizations, and local authorities can maximize the positive impact of the churches on the building to be constructed and the surrounding community. Shared Resources: Churches could potentially share resources with the building to be constructed, such as space for community events, volun- teers for maintenance, or support for youth programs. Joint Initiatives: Joint initiatives, such as youth sports programs, can foster a stronger sense of community and improve the overall quality of life in the area.

Source of images on this page are from members of group 3

OFAFA JERICHO PRIMARY SCHOOL

Positive Impacts: 1.Education Hub: As a primary school, it provides crucial education services to the local community, shaping the future of young minds. 2.Community Center: The school can potentially serve as a community cen- ter, offering spaces for extracurricu- lar activities, workshops, or community meetings. 3.Social Hub: The school can be a hub for social interaction and community building, fostering a sense of belonging among residents.

Potential Negative Impacts: 1.Traffic Congestion: School drop-off and pick-up times can contribute to traffic congestion in the surrounding area, potentially impacting access to the playground. 2.Noise: School activities, such as as- semblies or sporting events, can gener- ate noise that may occasionally disturb the peaceful enjoyment of the play- ground. 3.Security Concerns: Ensuring the safety and security of students may require increased security measures, which could have implications for the surrounding area.



JERICHO MARKET

Jericho market is to the west of jeri- cho playground. This market influences the local economical and social som- munity of jericho.The market act as a high source of traffic in Jericho Economic Activity & Accessibility: The market provides economic oppor- tunities for local residents through employment and access to affordable goods and services. This can indirect- ly benefit families utilizing the play- ground by increasing their disposable income. Community Hub: The market can serve as a social gathering place, fostering interaction and community building. This vibrant atmosphere can indirectly enhance the social environment around the playground

CAMP TOYOYO

Camp Toyoyo has a mixed impact on the surrounding area. While it pro- vides valuable recreational oppor- tunities and economic benefits, it also presents challenges related to traffic, noise, and potential security concerns

Source of images on this page are from members of group 3

INVENTORY

The chart shows a clear seasonal variation in sun-hours. There are two distinct peaks and troughs: Peak Sunhours: The highest number of sunhours occurs around March and October/November. This corresponds to the dry seasons in Nairobi. Lowest Sunhours: The lowest sunhours are ob- served around June/July. This coincides with the short rainy season.

ANALYSIS

Positive, There are long hours of sunshine and it beeing an open site, natural well lit light is guar- anteed . There also seems to be an opportunity for Solar energy harvesting given the long periods of sun- shine hours. Negative. The site and the neighborhood gener- ally lacks enough trees for shading thus the long hours will be very uncomfortable, due to minimal cooling effect. Potential glare of interior spaces during the long hours of sunlight and heat.. making interior spac- es uncomfortable.

RESPONCES

Solar Energy: The area is rich in solar energy and it would be a waste not to harvest it for use

Building orientation: The most preferable orientation would be along the North east- south west line. to reduce heat gain by hiding the longer facades of the structure

Sun shading: on top of improving on the fa- cades, sun shading will help reduce on glare on inevitable spaces in the design

Terraced spaces. In addition to having all these, in the event the heat gain is too much, introduc- tion of terraced spaces creates a cool ambiance comfortable for its users

Tree planting: The area is an urban heat areas with a lot of roads and bare soil thus tree plant- ing helps improve on the landscape and acts as a shield against the hot sun.

ORIENTATIO
N

TERRACE
S

SUN SHADING

SOLAR
ENERGY

Source of images on this page are from members of group 3

Source-Toky Terrace

https://jayminton.en.made-in-china.com/product/bJqULtdvHMRp/China-Popular-Expanded-Mesh-

The Promising Future of Renewable Energy in India: A Sustainable Revolution

INVENTORY

The general wind direction in Nairobi is from the North east to the South West direction at an arevare speed of 12 km/h. The site is surrounded by trees and vegetation so its likely that the speed of wind reaching the site id dialed down to a 9 or 10 km/h speed. Though within the site, there is no vegetation cover or trees to break this speed.

ANALYSIS

Psotive: There is availability of cross ventilation for the interioir spaces The wind being of low speed, it can be manipulat- ed and channeled easily as it offers no resistance. Negative: The site lacks vegetation cover, thus er- rosion is at a very high rate within the site as soil is easily carried away. Soiling of interior spaces. Asa with carries away the soil, it may be deposited into the structure making if very dust and uncomfortable for its users

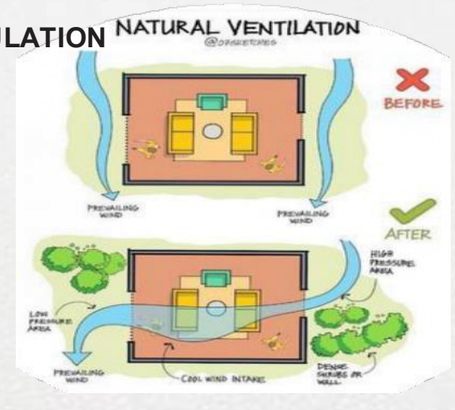
RESPONCE

Building Orientation.Openings can be positioned directly in the path of wind so as to create a cross ventilation type of movement of air for the spaces Wind Manipulation. On inevitable areas \, the path of wind can be doctored for a certain desired purpose Vegetation. Lack of soil cover on site needs to be looked into as it will prevent soil erosion, and soiling of interior spaces Wind filters, In addition to sun shaading devices, wind filters can be introduces on opening for dry months where vegetation goes to a minimum to help reduce its effect on interior spaces.

FILTERS

https://www.pinterest.com/lky3113/partition-divider/

WIND MANIPULATION



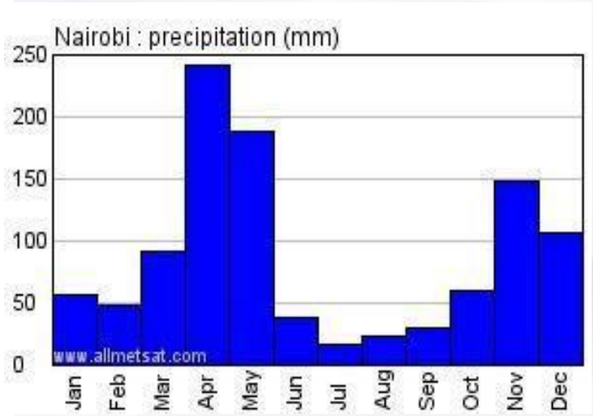
A cool guide on wind effects in architecture

GREEN SPACES

https://landezine.com/coyoacan-corporate-campus-landscape-by-dlc-architects/

Source of images on this page are from members of group 3

RAINFALL



Source:
https://en.allmetsat.com/climate

- Annual rainfall just over 610mm of rainfall
- Long rains occur from March to May with around 310mm of rainfall.
- Short rains occur from November to December with around 200mm of rainfall.

ANALYSIS

Positive

- Opportunity for rainwater harvesting during the long rains period as well the short rains.

Negative

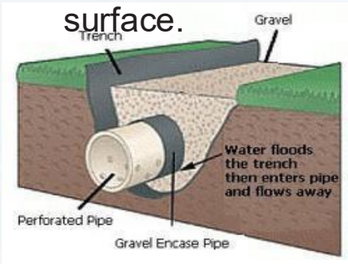
- Threat of the site flooding between March to May.

RESPONSES

- Intergrating of rainwater harvesting system. The collected water could be used for toilet flushing, landscape irrigation and building cleaning.

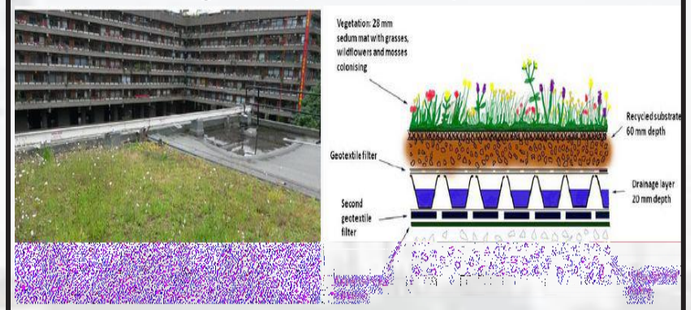
Source:
https://www.slideshare.net/slideshow/water-management-and-efficiency-in-hospitality/32288420

- Incorporation of french drain near sidewalks or driveway to address excess water puddles puddles by providing a pathway for water to flow away from the surface.



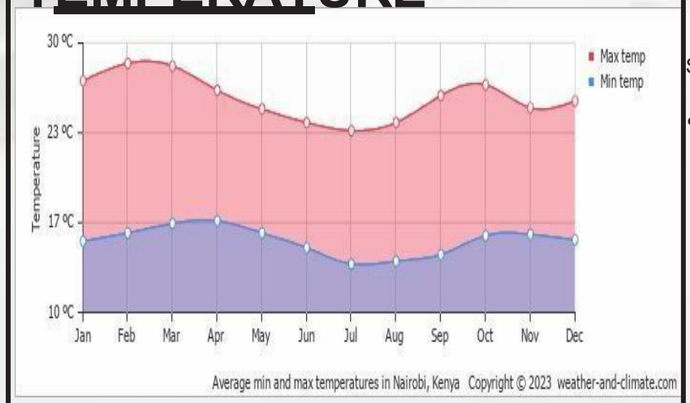
Source:
https://en.allmetsat.com/climate

- Use of green roof systems to prevent flooding by absorbing and slowly releasing rainwater through evaporation or plant use.



Source: Connop, Clough, Borland and Newport, 2015.

TEMPERATURE



Source:
https://en.allmetsat.com/climate

- Average temperatures range from around 15°C in the cooler months(May to August) to around 25°C in the warmer months(January to March).

ANALYSIS

Positive

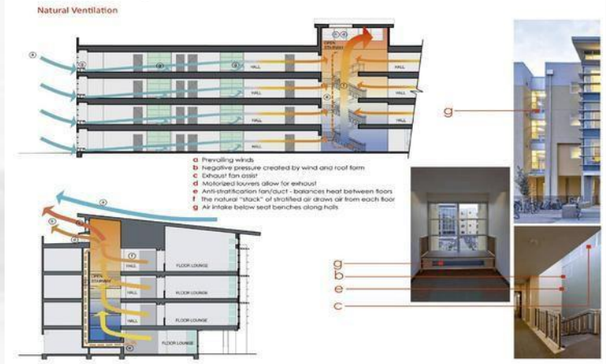
- Moderate temperatures in Jericho reduces the reliance on mechanical cooling and heating.
- Moderate temperatures allow for more effective natural ventilation strategies.

Negative

- There can be significant diurnal temperature variations, with cooler nights and warmer days.

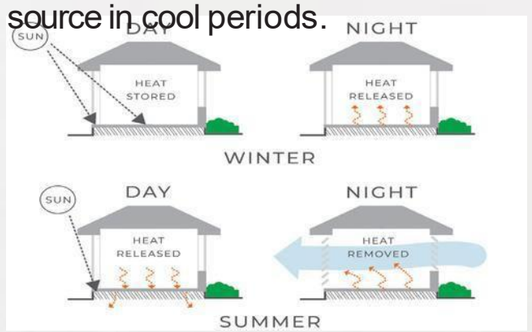
RESPONSES

- Natural ventilation strategies stack effect to improve indoor air quality, enable energy efficiency and cost saving.



Source: Uzunhasanoglu, Tolga. (2015).

- Use of building materilas such as concrete, stone and brick that have high thermal mass that maintain comfortable temperatures by acting as a heat sink in warm temperatures and a heat source in cool periods.



Source:
https://theconstructor.org/buildings

HUMIDITY

Source: https://weather-and-climate.com

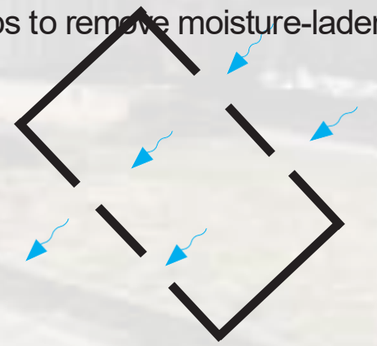
- Average annual percentage of humidity is 72(Highest in May at 78 percent Lowest in February at 62 percent).

ANALYSIS

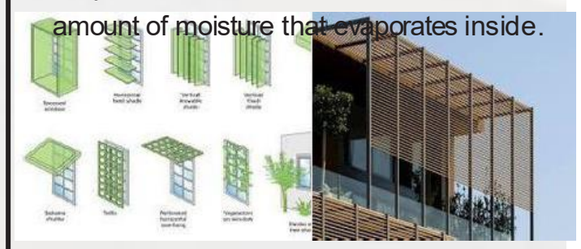
- High humidity levels especially during the rainy seasons(March-May and October-December).

RESPONSES

- Maximize cross-ventilation by strategically placing windows and other openings to encourage airflow. This helps to remove moisture-laden air



- Use shading devices to block direct sunlight from entering the building. This can help to keep the interior cooler and reduce the amount of moisture that evaporates inside.



Source: RachitaDalpati, 2024.

TOPOGRAPHY

SOIL TYPE.

RED SILTY SOILS

. CHARACTERISTICS -MODERATE TO POOR DRAINAGE -SLOW INFILTRATION -RISK OF WATERLOGGING

TERRAIN

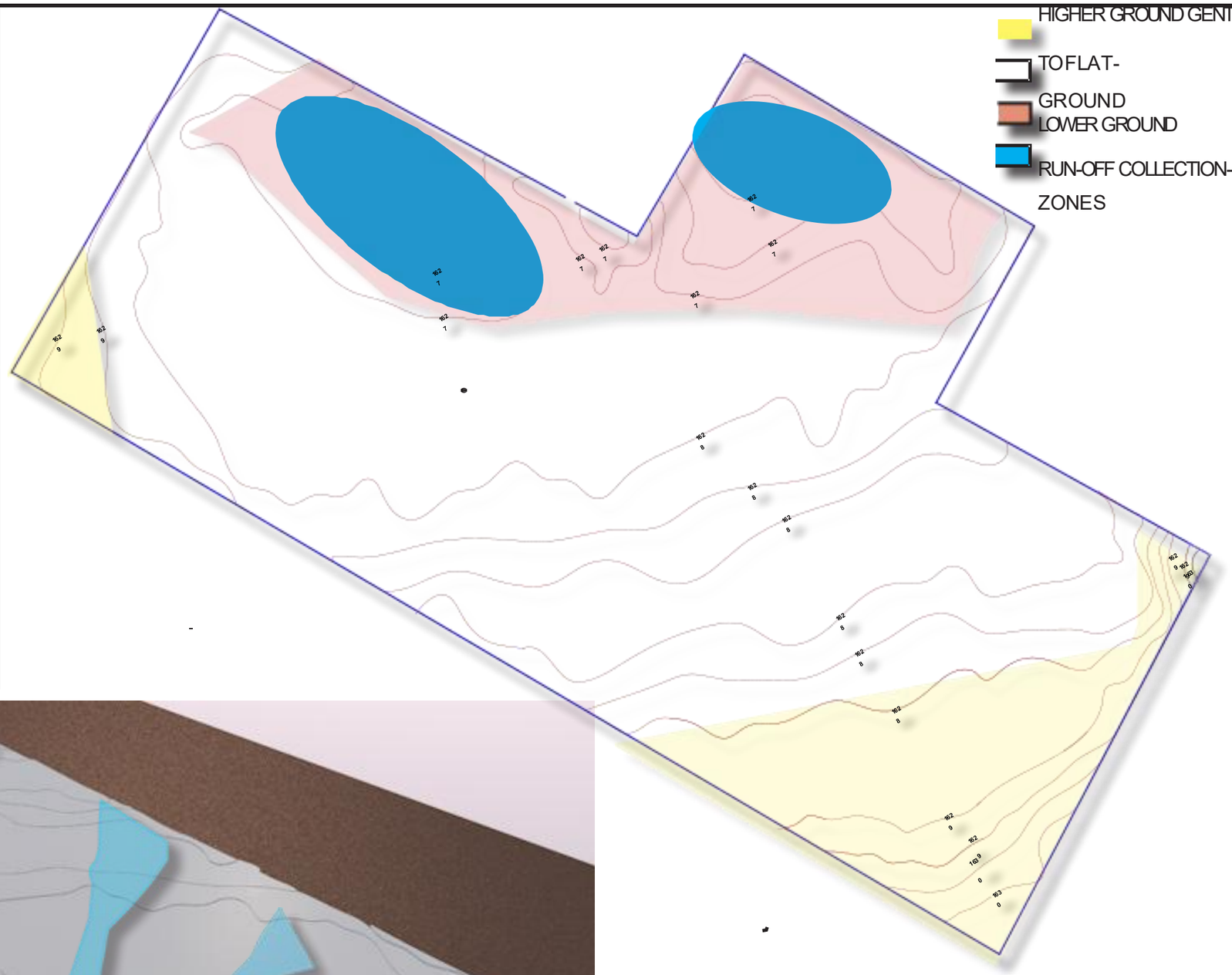
HIGHEST POINT -1630M ASL
LOWEST POINT -1627M ASL

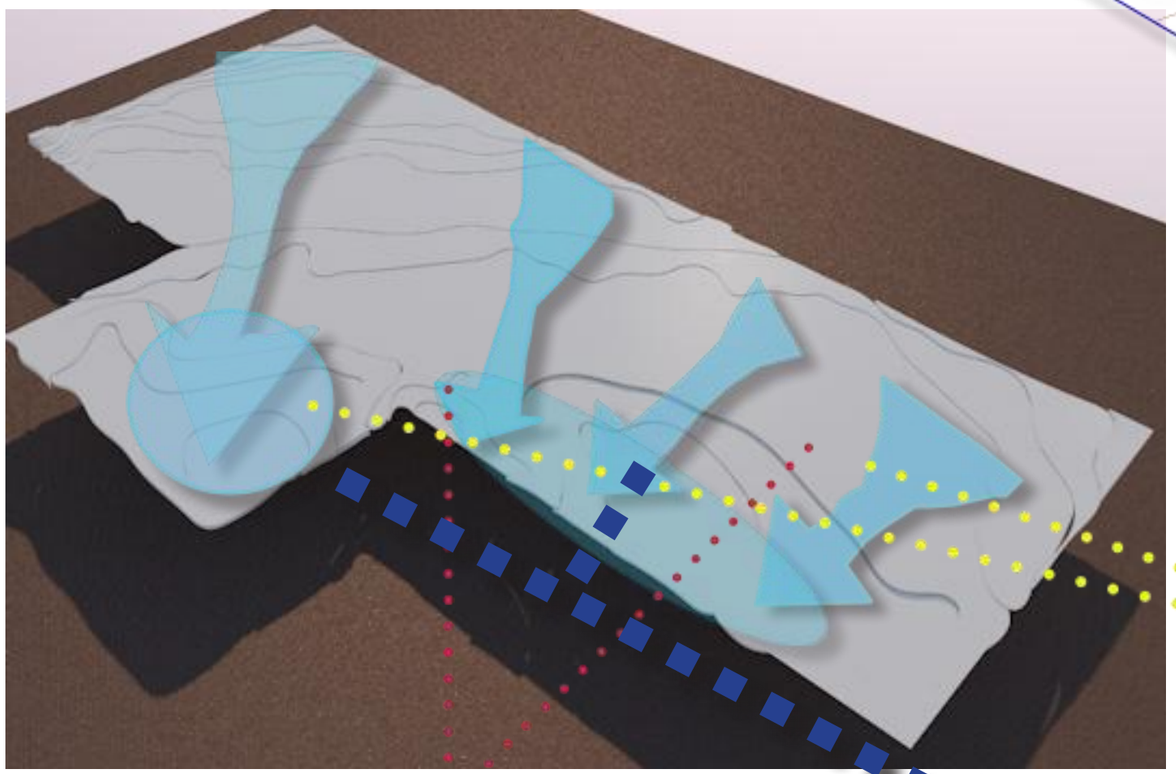
CHALLENGES

-FLO ODS

RESPONSE

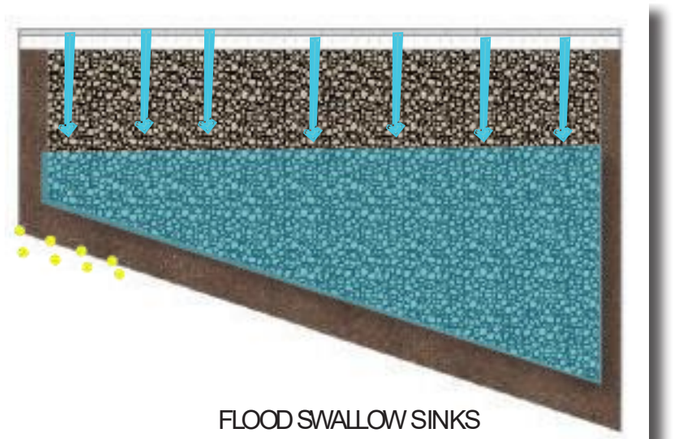
-CREATING FLOOD SWALLOW SINKS IN SURFACE RUN-OFF COLECTION ZONES -CHANNELING THE WATER TO CITY DRAINAGE GRID FOR TREATMENT AND RE-USE.





FLOOD PRONE ZONES

CHANNELED TO CITY GRID SYSTEM



FLOOD SWALLOW SINKS

Source of images on this page are from members of group 3

VEGETATION

SITE INVENTORY

The site is characterized by a diverse range of vegetation types. The plant life is categorized into several groups, based on their location, growth patterns, and ecological role within the environment. Tree Species: The site is home to a variety of mature trees Shrubs and Bushes: Numerous shrubs, such Duranta erecta. Groundcover and Herbaceous Plants: The site floor is covered with grass such as Eragrostic specie

RESPONSES

Replace existing patchy eragrostis species with kikuyu grass becouse odfast growth, hardiness, and resistance to disease and pests.

The bushes are currently poorly main-

tained and require trimming.. Response; water the hedges regularly, inspect them

for infection and apply fertilizer when necessary. trim to give it a formal neat look.

Plant various trees along the site which

will Often found in a variety of soil types,

including sandy

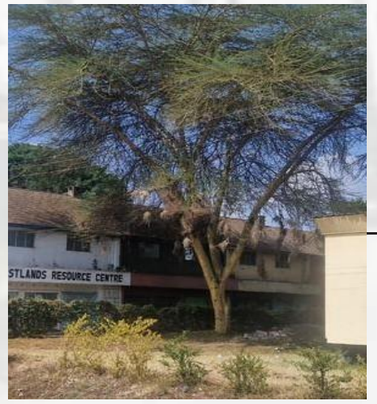
act as noise barrier from the noisy neighbourhood.

Plant grass on the site to cover the bare

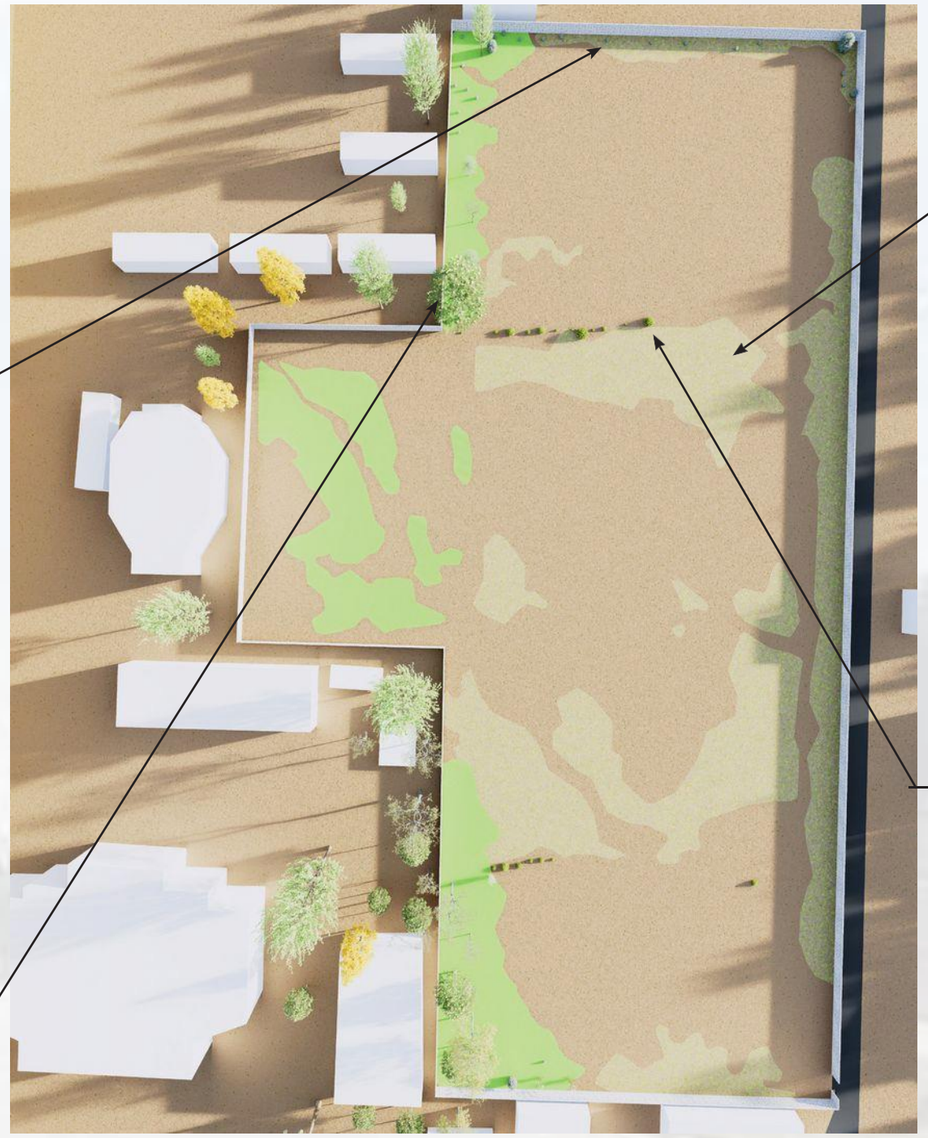
ground so as to reduce the dust.

Source of images on this page are from members of group 3

DURANTA ERECTA. A fast-growing, semi-evergreen shrub or small tree. Can reach heights of 2-6 meters Bright green in color, sometimes with a glossy texture Small, trumpet-shaped, and grow in clusters (racemes) at the ends of branches.



ACACIAS can be tall trees or low-growing shrubs Acacias bloom in clusters of small, yellow or whitish flowers



ERAGROSTIS SPECIES.A specie of grass that grow to be short or tall. its leaf blades are linear and often have in- rolled margins

BOUGAINVILLEA GLABRA best suited to a hot, dry climate drought resistant. It is a woody climber with curved thorns that sprawls and needs to be tied or have a structure such as a fence, wall for support.

3D images from the site showcasing some bare parts of the site with no ground coverage

UTILITIES

Inventory of Power Lines/ Street Lights/ Internet Lines/ Flood Light Location

A. - Along site boundary wall B. - Along Charles New Road C. - Along Shule Road

Positive Aspects

1.Presence of Street Lighting: •shows power poles with streetlights, indicating an effort to provide lighting for pedestrians and vehicles.

2.Connected Electrical Network: •The presence of multiple power lines suggests a relatively established electrical distribution network.

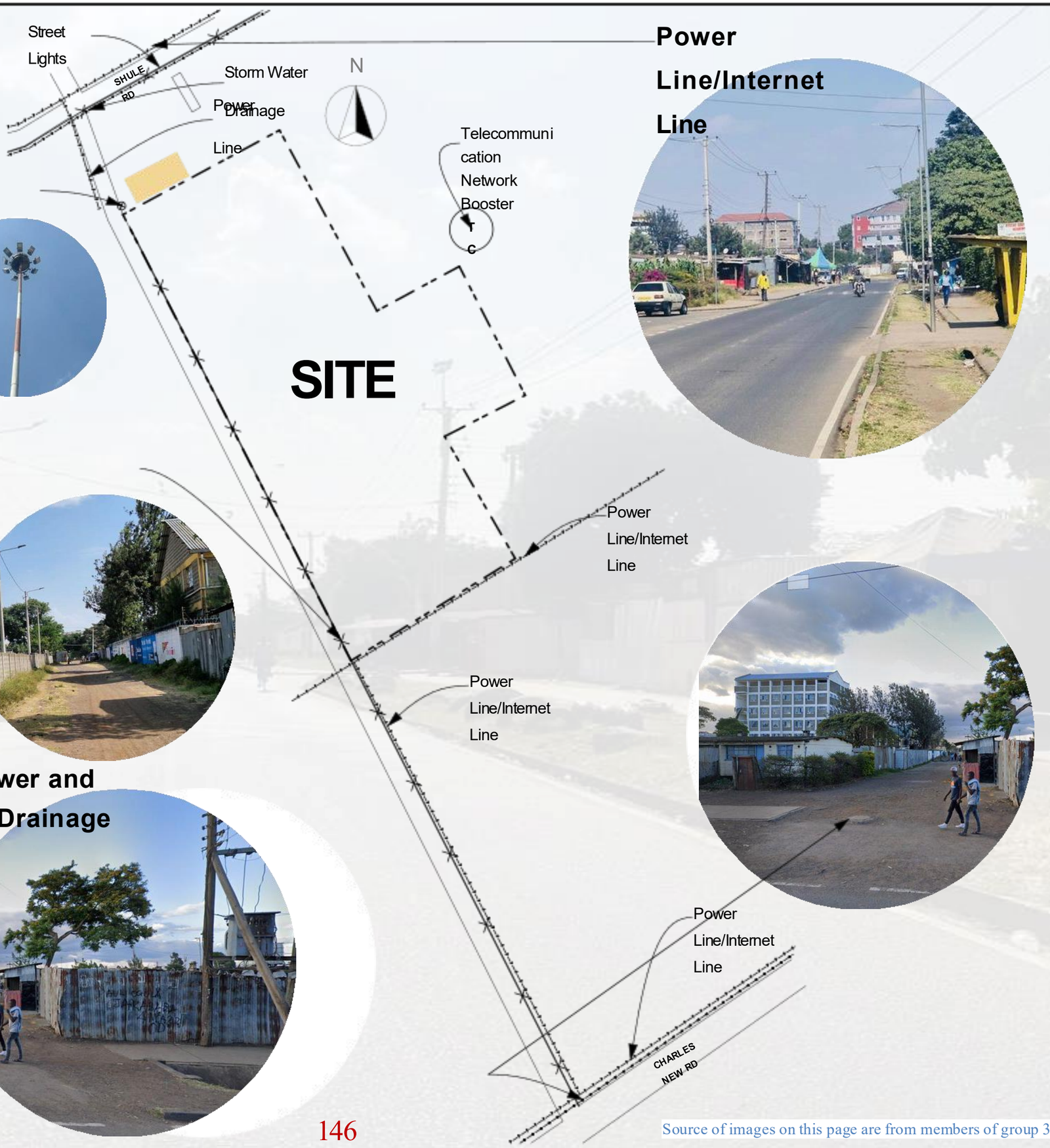
3.Accessibility for Repairs: •The poles are positioned along the road, making them accessible for maintenance and upgrades.

Negative Aspects

1.Tilted and Misaligned Poles: •Some poles appear slightly tilted, indicating possible structural weakness or poor installation.

2. Exposed and Hanging Wires: •Several cables seem to be hanging loosely between poles, which could pose electrical hazards.

3. Low-Hanging Power Lines: •The height of the power lines appears inconsistent, increasing the risk of accidental contact, especially with high vehicles.

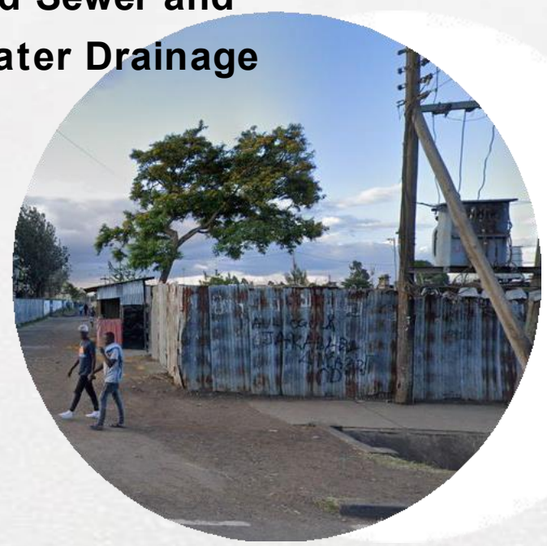


Flood Light

Power Line/Internet Line

Street Lights

Combined Sewer and Storm Water Drainage



Source of images on this page are from members of group 3

UTILITIES

Analysis of the Power Lines

The infrastructure indicates a functional but potentially hazardous power distribution system. While the presence of power lines and streetlights contributes to safety and development, issues such as misaligned poles, low-hanging wires, and possible overloading could lead to electrical failures, accidents, or even fires.

Response and Recommendations

1. Power Distribution: -Modular Design

2. Energy Efficiency:
-Energy-Efficient Lighting: LED lighting. -Use of sensors

3.Safety and Reliability: -Circuit Breakers and Fuses

4. Sustainability: -Renewable Energy Sources solar panels or wind turbines -Energy Storage Systems -Distributed Generation: Integrating distributed generation resources, such as rooftop solar panels, can improve grid reliability and reduce reliance on the central grid.

5. Communication and Control: -Building Management System : can integrate and control various building systems, including lighting, HVAC, and security, optimizing energy consumption and improving operational efficiency.

LED LIGHTING & MOTION SENSORS

RENEWABLE ENERGY SOURCES

Source of images on this page are from members of group 3

UTILITIES

Analysis of internet

-Technical Infrastructure: Ensuring reliable and high-speed internet connectivity throughout the exhibition hall can be challenging. -Accessibility: Ensuring that digital technologies are accessible to all visitors, including those with disabilities, is essential. -Maintenance and Updates: Keeping digital technologies up-to-date and maintaining them requires ongoing effort and investment.

Response and recommendation for internet

1. Interactive Touchscreens: -Touchscreens enable visitors to explore videos, audio recordings, and 3D models related to the exhibits.

2. Augmented Reality and Virtual Reality Experiences: -Immersive Storytelling: technologies transport visitors to different time periods, locations, or even inside artworks.

-Interactive Displays: IoT-enabled displays can respond to visitor actions, creating dynamic and engaging experiences.

3. Social Media Integration: -Content Sharing: Visitors can easily share photos, videos, and thoughts about the exhibition on social media platforms. -Community Building: Exhibition halls can use social media to engage with visitors, promote events, and gather feedback.

AUGMENTED REALITY & INTERACTIVE TOUCHSCREENS

VIRTUAL REALITY

HIGH INTERNET SPEED CONNECTIONS

Source of images on this page are from members of group 3

UTILITIES

Inventory of Sewer Lines and Storm Water Drainage and Water Supply

Location

A. - Along Charles New Road B.
- Along Shule Road

Positive Aspects

1.Presence of Storm Water Drainage Channels and Sewer Lines - connecting to Nairobi Water and Sewerage Company

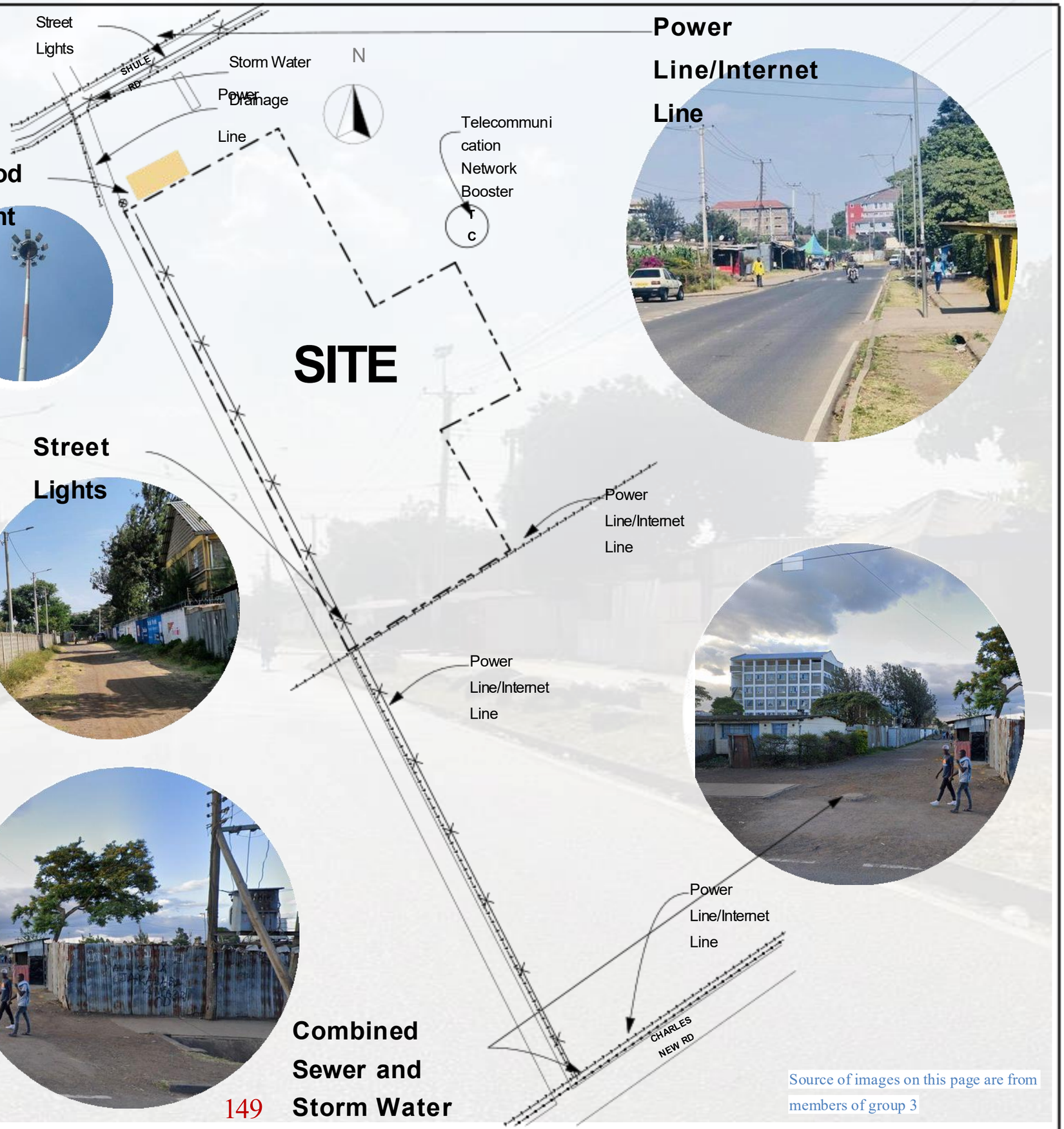
2. Availability of Water Mains Pipe Along Charles New Road - connecting to Nairobi Water and Sewerage Company

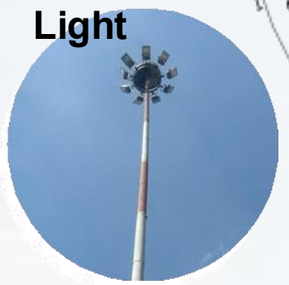
Negative Aspects

1.Blockage in Storm Water Drain Channels especially during rainy seasons

2. Poor Maintenance of the channels.

3. Water Supply may not meet needs of users due to frequent water supply shortages.





Combined Sewer and Storm Water

Source of images on this page are from members of group 3

UTILITIES

Design Considerations

1. Intermittent Water Supply may require storage tanks or secondary source e.g borehole and if possible water recycling plant to ensure sustainable use of water.

2. Water Quality challenges at times will necessitate use of water filtration systems.

3. Proper sizing of septic tanks to meet population needs.

4. Incorporation of graded slopes on site to ensure effective drainage of stormwater away from buildings.

5. Use of retention basins, bioswales, rain gardens to control surface run off water.

Responses

1. Use of Underground Water Tanks

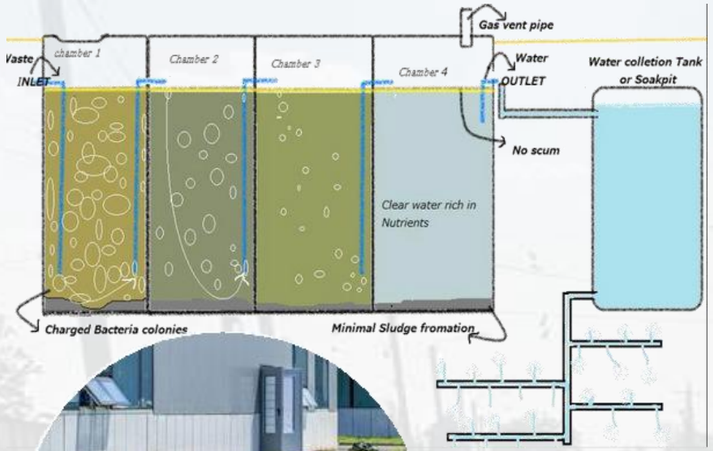
2. Use of Water Filtration Systems

3. Water Recycling Systems - Biodigester Tank System

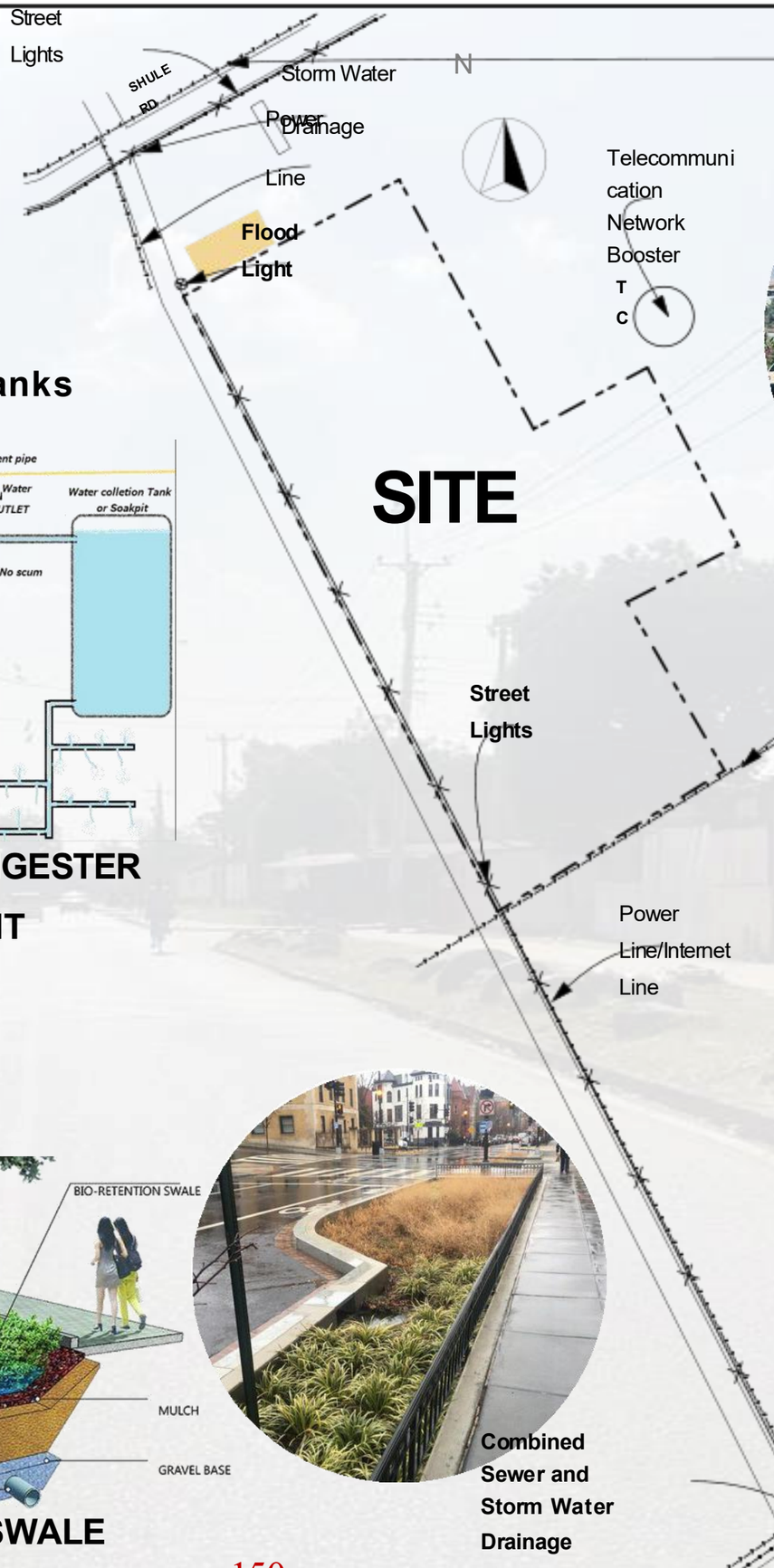
5. Graded slopes and Stormwater Catch Basins - Bioswales/Rain Gardens

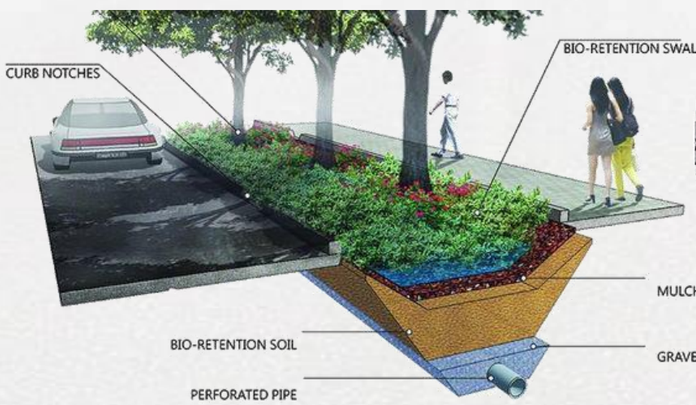
Source of images on this page are from members of group 3

Underground Watertanks



BIODIGESTER PLANT





BIOSWALE

Combined Sewer and Storm Water Drainage

Power Line/Internet Line

RAIN GARDEN

SECURITY & SAFETY

Security and Safety There is no police station around the area or neighborhood. Perimeter Security Existing Perimeter Wall (Height 2m) There are no streetlights on site Recommendations Have motion sensor streetlights

Access Control 1. Main Access Point is not welcoming Recommendation Have a more user friendly and engaging entrance.

Welcoming Access Design

Surveillance There are no survillance systems on site Recpmmendations CCTV Cameras installation Motion Sensors Alarm Sysytem

CCTV Surveillance Cameras

Fire Safety There are no fire prevention measures on site or around the neighborhood. Recommendations Have fire emergencies and prevention measures on site and take that to consideration during design work.

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DEVELOPMENT CONTROL GUIDELINES AND ZONING POLICIES

SITE INFORMATION

- Site islocated within Jericho hence falling under the Old Eastlands zone for development control policies. The area is
- classified as a NCCG (Nairobi City County Gorvernment) housing zone. Which makes it a residential zone. The site
- covers 26,680 m2 (6.67 acres).

ZONING POLICIES

Building line

A set back of 6 metres is required from the road for future road expansion, utility lines and pedestrian pathways.

Image of side walk in
Jericho Author 25 Jan, 2024

Building height

The allowed building height within Jericho for new developments or re-developments is 10 storeys.

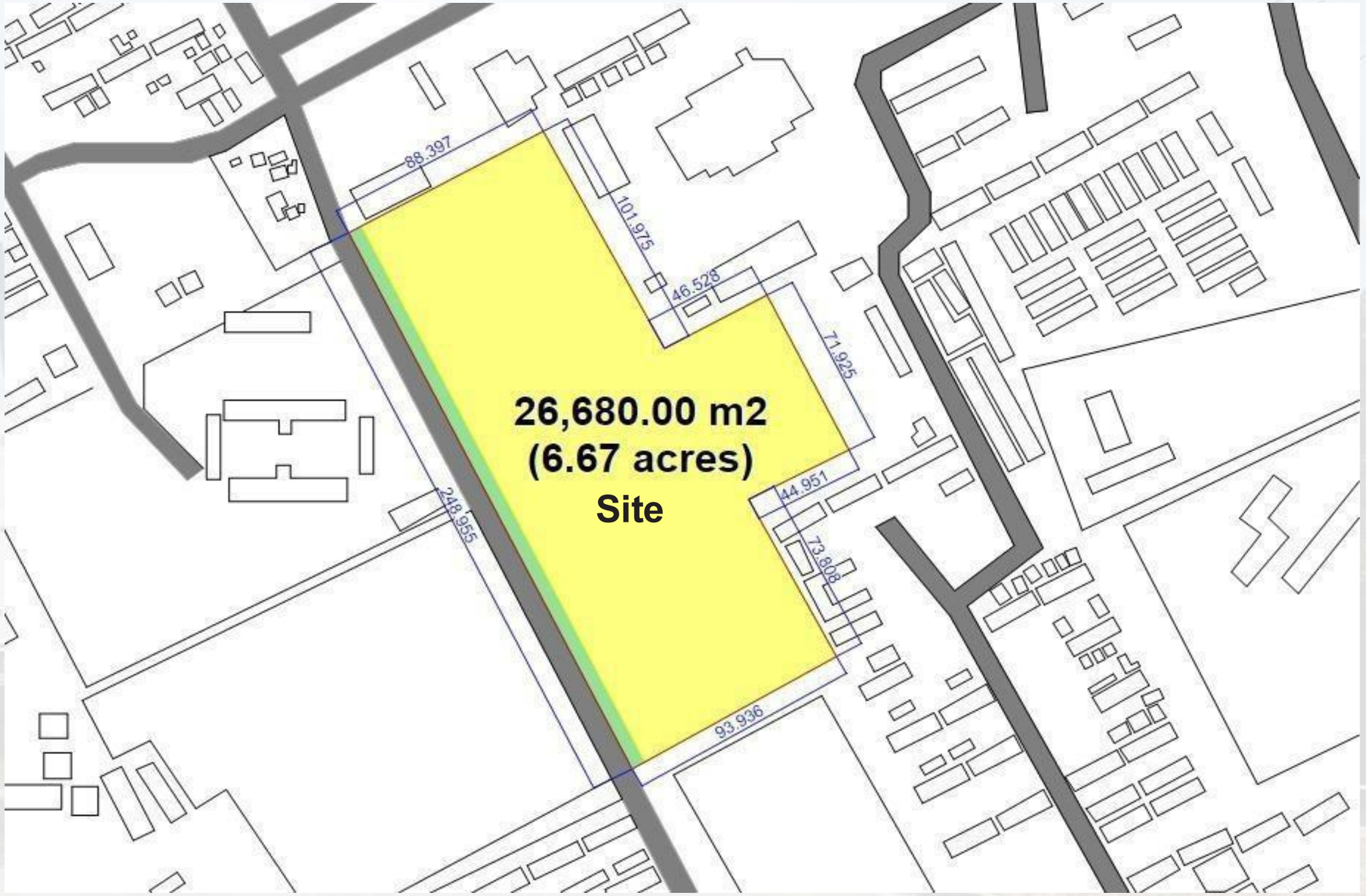
Ground coverage

The ground coverage allowed within Jericho is 50% of the entire plot size.

50% of 26,680 m2
Hence the ground coverage is 13340m2

Plot ratio

The plot ratio within Jericho is 500% of the entire plot size. 500% of 26680 m2 Hence the ground coverage is 133400 m2



RESPONSES

- Development of low rise buildings which blend in with the existing NCCG housing units with- in the surrounding neighbourhood.
- Design of open spaces which provide adequate natural lighting and ventilation to the spaces.
- Landscaping of unbuilt ground areas to create public spaces where both people and plant life may interact

National Architectural Heritage Museum
Omrania 15 Nov, 2017

Denver public library Rivervorth
photography 16 July, 2013

Source of images on this page are from members of group 3

Kenyatta University

Kenyatta University continues to stand at the forefront of higher education in Africa, driven by its commitment to excellence in teaching, research, and community engagement. Over the past year, the University has expanded its investment in infrastructure and digital learning platforms to enhance both in-person and remote study experiences. This focus has ensured that students benefit from world-class academic programmes delivered in an environment that promotes creativity, innovation, and collaboration. As of April 2025, Kenyatta University maintained its high global standing, ranked among the top institutions in Africa for research output, industry partnerships, and alumni impact. The University's emphasis on practical, hands-on training remains central to its mission, enabling graduates to seamlessly integrate into the workplace with industry-ready skills. Strong links with corporate partners, NGOs, and government agencies have led to expanded internship and employment opportunities for students, ensuring that they remain competitive in the global job market.

The Department of Architecture & Interior Design (DAID) has strengthened its role as a leader in sustainable design education, responding to emerging trends and global environmental priorities. In partnership with the School of Engineering and Architecture, the Department has introduced new courses in advanced building technologies, smart city planning, and climate-resilient design, equipping students to address modern urban and rural challenges. The curriculum continues to integrate sustainability principles into every stage of the design process, with an emphasis on energy efficiency, renewable materials, and community-focused development. The department's project-based learning model remains a core feature, giving students real-world problem-solving experience through studio-based projects, industry collaborations, and fieldwork. DAID's faculty—comprising experienced academics and practitioners from Kenya and abroad—have enhanced research and innovation output through collaborative projects, exhibitions, and publications. The Department's modern facilities, including design studios, workshops, laboratories, and digital fabrication labs, have been upgraded to support advanced learning needs. This environment nurtures a new generation of architects and interior designers who are equipped to contribute meaningfully to the evolving built environment, both locally and internationally.

THE TEAM

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

Rehab Hamdi 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 a half decades, including her tenure at Arab Academy for Science, Technology and Maritime Transportation (AASTMT) from 2000 to 2019 and at AI 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.

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

He is an Adjunct Professor of Architecture and Planning at JKUAT, KU and UoN, with 36 years of academic and professional experience. He has taught various courses, published widely, and served as editor for academic journals, and research books. Maringa has also worked as a consulting architect/planner for government and private firms. He is a registered architect and member of several professional bodies. Additionally, he has held senior expatriate roles in Kigali, Rwanda, serving as Ag., Deputy Vice Chancellor AA in KIST; technical expert & master trainer, associate project team leader (SCE) & Senior Expert project management and planning in WDA. He was a long serving State Officer - Principal Secretary in Kenya's Ministry of Transport, Infrastructure, Housing, Urban Development, and Public Works, in three of its five state departments. He has considerable expertise in sustainability, urban growth management, and TVET planning.

Google Scholar: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Paul+Mwangi+Maringa&oq=
Orcid: https://orcid.org/0009-0007-3471-8028.
ResearchGate: https://www.researchgate.net/profile/Paul-Maringa-2/publications
Academica.Edu: https://jkuat.academia.edu/PaulMwangiMaringa
Amazon:
https://www.amazon.com/Books-Prof-Paul-Mwangi-Maringa/s?rh=n%3A283155%2Cp_27%3AProf%2BPaul%2BMwangi%2BMaringa

Arch. Robinson Manguro

Robinson Manguro is a registered Architect with 19 years of practical experience in architectural design, supervision and project management within the East African region (Kenya, Uganda, Rwanda, DR Congo and Tanzania). He is a PMP Certified Project Manager with 10 years' experience at senior management level and has participated in International Conferences, Trainings and Workshops. He holds a masters in Architecture for Health from Sapienza University of Rome, a master of Arts in Project Planning and Management as well as a bachelor of Architecture from the University of Nairobi. He has a passion in healthy designs and affordable housing.He also has keen interest in education and is currently engaged as an adjunct lecturer at Kenyatta University department of Architecture. He has a passion for mentoring young people and has lectured at Kirinyaga University, the Technical University of Kenya and Maseno University.

Landscape Arch. Regina Wango Kasau

A Landscape Architect and Lecturer at Kenyatta University, Department of Architecture & Interior Design, specializing in Environmental Design. With a robust academic foundation, that includes a Master's degree in Architecture (Environmental Design option) and a Bachelor's degree in Landscape Architecture, Regina conveys a profound understanding of how built and natural environment intersect to effect ecological and human wellbeing.Her works emphasize the incorporation of sustainable principles into landscape and architectural design, specifically regarding how spaces can support emotional well-being.Among her published works include: 1)Inmates' perception of environmental factors affecting psychological well-being: a case of Kamiti maximum security prison in Nairobi, Kenya. *Journal of African Interdisciplinary Studies*, 8(10), 121-140.

2) The built environment of Kamiti maximum security prison, Nairobi: implications for rehabilitation and psychological well-being. *East African Journal of Interdisciplinary Studies,* 8(1), 176-191. https://doi.org/10.37284/eajis.8.1.2865.

3) Thermal comfort in urban open spaces in the tropics: a case of Nairobi County, Kenya. *Innovare Academic Sciences.*

Students' thesis supervised:

1)Impact of inclusive design on gender diversity in sports grounds: a case of Stima Sports Club, Nairobi, Kenya.

2) The role of biophilic design enhancing recovery of drug addicts in rehabilitation centres in Murang'a County.

3)Influence of architecture on human-wildlife coexistence in safari lodges: a case of Nanyuki, Kirinyaga County, Kenya.

DAID FORUM FOR RESEARCH AND DESIGN SOLUTIONS

2024/25, Vol. II, Studio IV,
Design of Museums, Libraries and Exhibition Halls,
Chapter Two: Site Analysis.

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