REPUBLIC OF KENYA

MINISTRY OF LANDS, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT

STATE DEPARTMENT FOR LAND AND PHYSICAL PLANNING

FIRST DRAFT PHYSICAL AND LAND USE PLANNING HANDBOOK

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ardhisasa
Shamba Lako, Hati Safi!

FORWARD

Kenya has experienced rapid socio-economic development for the last two decades, resulting in uncontrolled subdivision of land, urban sprawl, uncoordinated development, and environmental degradation among others. This is happening within the context of an outdated handbook, which is unaligned with the Constitution of Kenya 2010, the Physical and Land Use Planning Act No. 13 of 2019, Sessional Paper No.1 of 2017 on the National Land Use Policy and the National Spatial Plan among others. This has necessitated the review of the handbook to incorporate new planning paradigms and changes in circumstances such as governance systems, national aspirations and emerging sectors such as the Blue Economy.

The Constitution under Article 66 (1) provides for the regulation in the use of any land, or any interest in or right over any land, in the interest of defence, public safety, public order, public morality, public health, or land use planning. In order to carry out this function, it gives the state the mandate under the Fourth Schedule to prepare general principles of land use planning. In fulfilment of this mandate, the national government performs the functions of; formulation of spatial planning policies, strategies, guidelines and standards. This handbook is therefore a significant accomplishment by the Ministry of Lands and Physical Planning in the performance of the given mandate.

The guidelines and standards contained in this handbook are applicable throughout the country in the provision of physical and land use planning services. They will form a basis for enhancing the capacity of counties in the preparation and implementation of physical and land use development plans and act as a tool for standardizing processes and procedures. The handbook will be reviewed after every ten years to reflect on the dynamism and emerging trends in physical and land use planning.

I expect that once the guidelines and standards in this handbook have been adhered to, then, we shall have beautiful, dignified, secure and sustainable urban and rural settlements for the benefit of the people of Kenya

Alice Wahome
Cabinet Secretary
Ministry of Lands, Public Works, Housing & Urban Development

PREFACE

Sustainable development calls for coordination in the carrying out of the mandates of all sectors. The handbook is a tool that guides and harmonizes the development through a set of guidelines and standards. It will benefit the professions in the built environment, County Governments, academia, professional bodies, Ministries, Departments and Agencies (MDAs) and the general public.

The formulation of the handbook was motivated by the need to implement the Constitution of Kenya, 2010, and related legislative provisions on physical and land use planning, address the gaps in the new planning paradigms (corridor development, techno and resort cities development, sectional development) and incorporate the Disaster Risk Management (DRM) considerations in physical and land use planning. The handbook will therefore provide a basis for coordination of sectoral developments and provide guidelines and standards to all the County Governments to ensure harmonised developments. It will also be critical in addressing disaster risks that the counties are likely to encounter.

I am confident that this handbook will go a long way to ease the work of all institutions and practitioners involved in physical and land use planning in the country. I therefore appeal to all stakeholders to cooperate in the implementation process.

Hon Generali Nixon K. Korir
Principal Secretary
State Department for Lands and Physical Planning

EXECUTIVE SUMMARY

Kenya has been experiencing rapid development in all sectors of the economy including agriculture, health, manufacturing, housing, and environment. The lack of an updated set of Physical and Land Use Planning Guidelines and Standards has significantly contributed to the current disorderly and uncoordinated physical development in various parts of the country, particularly in urban areas. Such development is unsightly, undesirable, costly to the national economy, and therefore unsustainable.

The Constitution of Kenya 2010, National Land Policy, National Land Use Policy and Sectional Properties Act, have recognised planning as a requirement before development. Devolution has presented a paradigm shift in the undertaking of planning functions in the country. Vision 2030 identified different development projects and programmes geared towards transforming the country and prioritized the preparation of the National Spatial Plan to spatially guide the implementation of the projects and programmes. This compounded with emerging concepts such as techno and resort cities, corridor development, and disaster risk management has necessitated the review of the previous handbook. The purpose of the review of the handbook therefore is to align it to the Constitutional, policy and legal requirements and provide standards and guidelines for coordinated development in the country.

The preparation of this handbook adopted a collaborative, multi-disciplinary, multi-sectoral and participatory approach involving all stakeholders drawn from the public, private and non-state actors. Desktop studies and benchmarking were also undertaken to provide the best practices from Ghana, Nigeria, Rwanda, Malaysia, and Singapore among others.

Some of the key highlights incorporated in this handbook include guidelines and standards on Disaster risk management, groundwater recharge basins, green cities, blue economy, techno cities, smart cities, vehicle charging stations, multi-modal interchanges and corridor development among others. The handbook is organized into five chapters as follows:

i. **Introduction:** The chapter gives the justification and objectives for preparing the handbook. It also gives the methodology and guiding principles to be adopted in plan preparation and implementation.
ii. **Policy, Legal and Institutional Context:** This chapter focuses on legal and policy aspects on which the handbook was prepared.
iii. **Physical and Land Use Planning:** The chapter provides the procedure for plan preparation and implementation, types and contents of physical and land use development plans.
iv. **Development control:** This chapter discusses various types of development applications, the requirements and the approval processes
v. **Planning standards and guidelines:** This chapter provides for sector-specific minimum requirements for development approval, implementation and enforcement

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The preparation of the physical and land use planning handbook was a collaborative effort involving Ministries, Departments and Agencies, academia, Non-Governmental Organizations, professional bodies, practitioners and development partners.

The Department of Physical Planning would like to acknowledge the National Treasury for coordination and financial support through the Development Policy Credit with a Catastrophe Deferred Draw Down Option (Cat DDO) Programme.

I further wish to acknowledge with deep gratitude the County Governments of Bungoma, Homabay, Kisii, Kiambu, Kitui, Narok and Kericho which were instrumental in providing information and enriching the handbook.

Special recognition goes to the National Land Commission, Ministry of Defence, Ministry of Education, National Disaster Operation Unit (NDOC), Department of Metropolitan Development, State Department of Public Works, Kenya Power and Lighting Company, Kenya Urban Roads Authority, Kenya Maritime Authority, Kenya Civil Aviation Authority, Kenya Airports Authority, Communication Authority of Kenya, National Construction Authority, Kenya Railways, Conservator of Forests, National Environment Management Authority for their great deal of support, active participation and contributions in the preparation of the handbook.

My appreciation goes to experts from the University of Nairobi, Technical University of Kenya, Kenya Institute of Planners, Architectural Association of Kenya (Town Planners Chapter), and Town and Country Planners Association of Kenya for their valuable contributions to the planning handbook.

Lastly, I would like to thank the planning team from the Department of Physical Planning for their professionalism and dedication in preparing the handbook within the set timelines.

Dr. Plan Peris Mangira
Ag. National Director of Physical Planning

DEFINITION OF TERMS

"Areas of maximum control" comprise of zones in both urban and rural areas. It includes conservation areas, historical sites, scenic routes, parks, nature reserves, open spaces, high-profile tourist areas, along coastlines and river reserves; agricultural, peri-urban; and most of the residential environment. Advertisements in these areas are strictly controlled to ensure that they do not intrude into, dominate, or derogate in any way the character or quality of the environment. High-impact advertisements are strictly prohibited in these areas.

"Areas of Minimum Control" comprise of zones in urban areas including transport nodes, transportation terminals, parts of the CBD and industrial areas.

"Areas of partial control" comprise of zones in urban areas including commercial areas, educational institutions, stadia, fields and arterial routes.

"Artisanal mining" means traditional and customary mining operations using traditional or customary ways

"Bio retention" means landscaped depressions or shallow basins used to slow and treat on-site stormwater runoff.

"Building Lines" means a limit beyond which a house must not extend to a street.

"Bus Rapid Transit" (BRT) is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective services at the metro level. It comprises of provision of dedicated lanes, with bus ways and iconic stations typically aligned to the center of the road, off-board fare collection, and fast and frequent operations.

"Bus Rapid Transit Corridor" is a section of road or contiguous roads served by a bus route or multiple bus routes with a minimum length of 3kms that has dedicated bus lanes and otherwise meets the BRT basic minimum requirements

"Carbon sequestration" is the process of capturing and storing atmospheric carbon dioxide.

"Carbon sink" refers to any reservoir, natural or otherwise, that accumulates and stores some carbon-containing chemical compound for an indefinite period and thereby lowers the concentration of carbon dioxide (CO^2) in the atmosphere.

"Clear height" is the vertical distance between the lowest edge of the sign and the ground level.

"Condominiums" are large property complexes comprised of individual units, whereby each unit is owned separately and ownership usually includes a non-exclusive interest in certain community facilities controlled by the management.

"Construction hoarding advertisements" are large boards erected around a construction site, which can prominently feature printed graphs and designs.

"Corridor development planning" is an approach that supports regional development, aiming at linking regions within the country to its trans-borders majorly through transport corridor planning that spurs economic growth and addresses infrastructure gaps.

"Desalination" is a technique where the excess salts are removed from seawater or brackish water converting it into safe portable or usable water.

"Disaster" is a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.

"Disaster Risk" is the potential loss of life, injury, or destroyed or damaged assets, which could occur to a system, society or a community in a specific period, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

"Disaster risk management" is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.

"Fire tender" is a unit of apparatus used by a fire protection service to transport men, extinguishing agents, and equipment to the scene of a fire.

"Gated Communities" is a group of homes that are surrounded by a gated wall, fence, or other physical barrier.

"Greenfield smart cities" are cities that are built on a greenfield and bring together eco-friendly elements and highly developed infrastructure thus blending both sustainable development and the next level of human habitation.

Kiss-and-ride denotes a facility designed to allow commuters to be dropped off by car and complete their journey by public transport.

"Marine bioprospecting" means the search for bioactive molecules and compounds from marine sources that have new, unique properties and the potential for commercial applications. Its applications include medicines, food and feed, textiles, cosmetics and the process industry.

"Park-and-ride" is a system for reducing urban traffic congestion in which drivers leave their cars in car parks on the outskirts of a city and travel to the city centre on public transport.

"Passage width of platforms" is the intermediate distance between departure bays and waiting bays.

"Resort city" is an urban area where tourism or vacationing is the primary component of the local culture and economy.

"Retrofitted smart cities" are existing cities that are developing, upgrading or furnishing infrastructure with technology.

"Roadside stations" are designated rest areas found along highways to provide restrooms, restaurants, and health facilities for travellers to address fatigue and enhance road safety for both drivers and passengers.

"Sectional Property" is defined as a space that is situated within a building and described by reference to floors, walls and ceilings within buildings. The concept of sectional properties entails a sectional unit together with a distinct share of the common area.

"Service area" is the sum of all areas on all floors of a building used for custodial supplies, janitorial sink rooms, closets and public restrooms

"Techno City" is a well-defined and delineated geographical urban area characterized by advanced technology and or devoted to technological research, development or production.

"Transport interchange" is the place where transfers between different public transport lines or modes occur. Either interchanges can be the physical action of transferring between services or modes as part of the passenger's journey or it can be the physical location that provides access to the public transport system.

"Vegetated swales" are open, shallow channels densely planted with a variety of trees, shrubs, and/or grasses to slow runoff, filter water, and promote infiltration into the ground.

"Water towers" means an elevated geographical area comprising of mountains, hills, and plateaus where the topography, geology, soils and vegetation support reception, retention, infiltration, and percolation of precipitation. It also acts as storage of groundwater that is released through springs, streams, rivers, swamps, lakes, and oceans to sustain connected bio-diverse ecosystems.

ACRONYMS

4Rs	Reduce, Reuse, Recycle and Recover
BRT	Bus Rapid Transit
BTS	Base Transceiver Station
CAK	Communication Authority of Kenya
CaT DDO	Catastrophe Deferred Drawdown Option
CBD	Central Business District
CIDP	County Integrated Development Plan
CNZ	Cross National Zones
CSP	County Spatial Plan
DRM	Disaster Risk Management
EA	Environmental Audit
EEZ	Exclusive Economic Zones
EIA	Environmental Impact Assessment
GFA	Gross Floor Area
IEC	International Electro-technical Commission
ISUDP	Integrated Sustainable Urban Development Plan
KFS	Kenya Forest Service
KmpH	Kilometre per Hour
KRC	Kenya Railway Corporation
KWS	Kenya Wildlife Service
LAPSSET	LAMU Port-South Sudan-Ethiopian-Transport
LCDA	LAPSSET Corridor Development Authority
LH	Lower Highlands
LM	Lower Midlands
LU	Livestock Units
MDAs	Ministries, Departments and Agencies
MPA	Marine Protected Areas
MSP	Marine Spatial Plan
NEMA	National Environmental Management Authority
NMT	Non-Motorised Transport
NSP	National Spatial Plan
PLUPA	Physical and Land Use Planning Act, No.13 of 2019
PPP	Private Public Partnership
SBP	Science-Based Parks
SEA	Strategic Impact Assessment
SEZ	Special Economic Zones
SGR	Standard Gauge Railway
SIA	Social Impact Assessment
TOD	Transit-Oriented Development
UH	Upper Highlands
UM	Upper Midlands

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CHAPTER 1: INTRODUCTION

1.1 Background

Physical and land use planning is the continuous process of designating, regulating, evaluating, and organizing the present and future use of land and development of land with the aim of achieving the optimum level of land utilization in a sustainable manner. This process has to be guided by a set of rules, regulations and standards. The Constitution of Kenya 2010, provides for productive, efficient and sustainable use of land and land-based resources. The handbook therefore provides a clear understanding of planning practice by elaborating on policies, processes, guidelines and standards applicable to the planning function.

This handbook is geared towards the implementation of the Physical and Land Use Planning Act No.13 of 2019 and its subsidiary regulations. Specifically, the handbook standardizes the planning practice in the country and responds to dynamic development trends.

1.2 Problem Statement

Kenya has in the last two decades experienced transformation in terms of investment in physical and social infrastructure, rapid urbanization trends, and exploration of minerals, which have led to changes in land use patterns. This transformation needs to be organized to ensure returns in the economy.

The new economic frontiers of the blue economy, techno and resort cities, corridor development and mineral exploration require a framework to guide their development. There is need to take cognizance of the emerging global, regional and local trends such as climate change and the level of disaster preparedness to ensure that developments achieve the expected sustainable outcomes.

The need to review the handbook has been necessitated by the enactment of the Physical and Land Use Planning Act, 2019 and relevant legislations and policies on land use as well as the current dynamics in development.

The previous handbook was outdated and not comprehensive. It failed to adequately address fundamental physical and land use planning standards and was incongruent with other statutes and policies affecting physical and land use planning. It also failed to recognize the roles played by other institutions that were established under the new constitutional dispensation. The lack of up-to-date physical and land use planning guidelines, uncoordinated private planning practice, and lack of standards and guidelines that address challenges such as climate change, disaster preparedness and management and informal settlement necessitated the review of the handbook.

1.3 Purpose

The purpose of this handbook is to standardize the physical and land use planning practice throughout the country.

1.4 Objectives

1. To provide guidelines and standards for coordinating physical and land use planning practice.
2. To guide the professionals involved in the physical and land use planning practice and relevant stakeholders in decision-making.
3. To mainstream disaster risk management and climate change adaptation mitigation measures in physical and land use planning practice.

1.5 Principles

The guidelines and standards are anchored on the following principles:

- **Accessibility:** all parcels of land must be provided with adequate access.
- **Aesthetics:** developments should be organized in a visually appealing manner.
- **Compatibility:** land use activities should co-exist in harmony.
- **Convenience:** movement from one place to another should take the shortest time possible.
- **Conservation:** Protection and care of resources should be upheld.
- **Efficiency:** Resources should be used optimally.
- **Economy:** The available resources are to be used sparingly and synergistically.
- **Equity:** There should be fairness in the provision of human basic needs and employment opportunities
- **Health, Safety and Welfare:** All developments should ensure the safety and welfare of the users.
- **Resilience:** All physical and land use development plans must promote the ability of developments to recover and adapt quickly from a disaster with ease
- **Sustainability:** All resources should be utilized without compromising the needs of the future generation
- **Urban containment:** All developments in urban areas should be concentrated within a delineated boundary

1.6 Land Use Planning and Disaster Risk Management

Sphere of occurrence

The manifestation of disasters/risks/hazards on land may be broadly classified under four major categories namely:

- Environmental: Floods, drought, landslides, fires, rock falls, earthquakes, tsunamis, heat waves, locust invasions
- Economic: political violence, economic recession/inflation, factory/market fires
- Social: pandemics/diseases, displacements, resource use conflicts
- Occurrences on infrastructural facilities and utilities: accidents, collapse of mines, collapse of buildings, road accidents, fires, oil spillages, technological risks

Land use planning is influenced by several factors among them being community practices, national and international policies, natural environment and climate change. All these happen on land. Proper mechanisms need to be in place to ensure that these factors take place in a coordinated and sustainable manner. Disaster risk management is crucial in ensuring that human activities in these areas are managed sustainably to benefit the present generation while considering future generations as well.

Figure 1 illustrates the relationship between the various manifestations of disasters/risks occurring on land and how the physical and land use planning intervention with the consideration of Disaster Risk Management will mitigate them

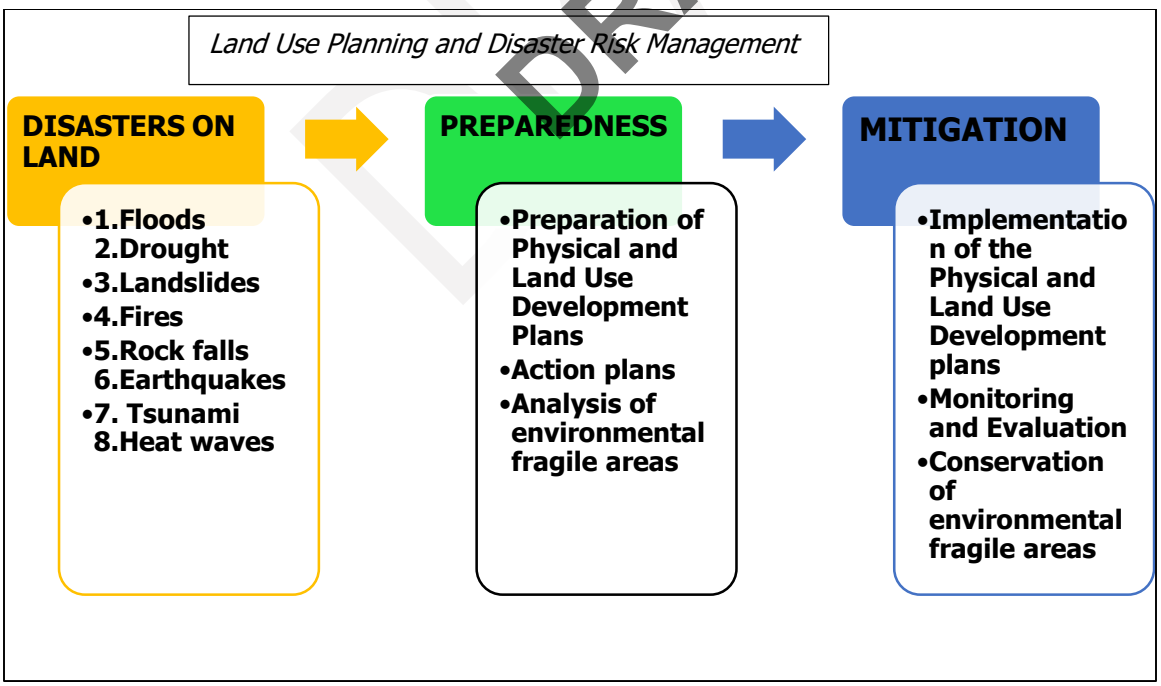

Figure 1: Land Use Planning and Disaster Risk Management
Source: Physical Planning Team; 2022

1.7 Methodology

The preparation of the handbook was done in a multi-sectoral, multi-disciplinary and participatory manner through the following stages:

Formulation of concept paper: This was done to conceptualize the assignment and give a road map to the preparation of the handbook.

Identification of thematic areas and formation of technical working groups: Thematic areas were identified based on sectors namely, agriculture, environment and natural resources, human settlement, economy, industry, tourism, transport, infrastructure, blue economy and energy. These informed the formation of the technical working groups.

Desktop reviews: they were done by reviewing various National policies and legislations as well as drawing best practices from other countries namely Ghana, Rwanda, Uganda, South Africa, China, Hong Kong, Japan, Australia, India, and the United States of America.

Work sessions: Brainstorming sessions and group discussions were conducted to gather different views and ideas to inform the preparation of the handbook.

Identifying gaps, further research and polishing: Review of draft handbook to identify gaps, undertake research to fill gaps and polishing to ensure consistency and coherence.

Stakeholder engagement: A consultative workshop was undertaken with different stakeholders from NLC, KCA, NEMA, KURA, Public Works, Department of Metropolitan, TUK, KIP, AAK, County government of Kitui, Kisii and Homabay among others.

Peer review: A peer review workshop was also held with representatives from NCA, NEMA, KNBS, COG, University of Nairobi (UON), Technical University of Kenya (TUK), Kenyatta University, Maseno University, Institute of Engineers of Kenya and esteemed Kenyan planners.

Validation: Stakeholder engagements were conducted with representatives from all the County Governments who validated the draft.

1.8 Targeted Users

The handbook targets the following users:

- County Governments
- Government Ministries, Departments and Agencies
- Professional practitioners in the built environment, disaster risk management and related fields
- Academic institutions offering training in the built environment and related fields
- Professional bodies in the built environment and related fields
- Non-Governmental, Community based Organizations and Civil Societies
- General public

CHAPTER 2: POLICY, LEGAL AND INSTITUTIONAL CONTEXT

2.1 Overview

The preparation of the handbook was anchored on the Constitution of Kenya 2010, under Article 66 which mandates the state to regulate the use of land to ensure defence, public safety, public order, public morality, public health or land use planning. In addition, the handbook was guided by legal, policy and institutional frameworks as presented in sections 2.2-2.4

2.2 Policies

The handbook is anchored on the following policies:

Sessional Paper No. 3 of 2009 on National Land Policy

The Sessional Paper No. 3 of 2009 on National Land Policy identifies the need for the Government to establish development control standards, processes and procedures that are efficient, transparent and accountable. It takes into account International Conventions and national policies relating to the sustainable use of land and the preservation of environmental values. The policy further recognizes that the current planning standards and regulations are outdated hence posing challenges in development control, implementation and enforcement of approved plans, policies and strategies. It advocates for the need to review planning and development control legislations to harmonize the governance structures, decision-making processes, planning standards and regulations.

Sessional Paper No. 1 of 2017 on National Land Use Policy

The Policy stipulates that in order to promote and ensure productive and sustainable use of land, there is need to develop a set of planning guidelines, policies and standards which shall be observed and enforced by the county governments and other sectoral agencies within the frameworks of approved physical and land use development plans. The objective of the policy is to ensure sustainable urbanization and promote the development of adequate and appropriate shelter, and adequate provision of infrastructure and services in human settlement planning. It mandates the National Director of Physical Planning to prepare and disseminate appropriate physical planning guidelines, manuals and standards including the revision of the Physical Planning Handbook for effective implementation and mainstreaming of policy guidelines, principles and strategies.

The National Spatial Plan (NSP) 2015-2045

The NSP outlines various development strategies/approaches for spatial growth and development of the country by addressing factors that prevent the country from achieving the intended national goals and objectives. It outlines policy statements for the different thematic areas and provides measures to achieve the provisions of the policy statements.

NSP recommends the development of regulations and standards for infrastructural developments, eco-tourism establishments, standards for open/green space on private development and sustainable forest management among others.

National Policy for Disaster Management in Kenya, 2009

The Policy was established to respond to the increasing cases of desertification and other climate change-related disasters. It provides background information on disaster patterns and profiles in Kenya including existing categories of disasters.

The Policy mandates the Directorate for Special Programs to collaborate with the various Ministerial Development Agencies including the State Department for Physical Planning to develop appropriate guidelines and standards for Disaster Risk Management. The physical planning handbook mainstreams disaster risk reduction guidelines and standards for effective disaster management throughout the country.

The National Urban Development Policy (NUDP), 2012

The NUDP seeks to create a framework for sustainable development and management of education, health facilities, public open spaces, parks and recreational facilities, including sports amenities. On this basis, the handbook provides guidelines and standards for planning these facilities while mainstreaming disaster risk reduction to ensure urban safety.

Sessional Paper of 2012 on Integrated National Transport Policy

The Policy seeks to develop, operate and maintain an efficient, cost-effective, safe, secure and integrated transport system to promote national and international development. It categorizes the transport sector into road, railway, air, pipeline, maritime and inland water transport, which requires strategic planning and development to attain a world-class transport system that is responsive to the Country's social and economic needs. Additionally, the Policy promotes the structuring of Non-Motorized and Intermediate Means of Transport for rural and urban areas in a manner that ensures environmental sustainability. These provisions have informed the formulation of guidelines and standards for integrated transport development in the planning handbook.

National Environment Policy, 2013

The Policy forms the basis for integrated planning and sustainable management of natural resources in the country by proposing a broad range of actions for responding to key environmental issues. The Policy promotes the development and implementation of national and international standards, principles and criteria for sustainable environment and natural resource management. In addition, it upholds the integration of environmental concerns in physical and land use planning, and development processes. The handbook has mainstreamed the provisions

of this Policy by developing standards and guidelines to enhance the conservation and management of ecosystems and the sustainable use of natural resources.

National Climate Change Response Strategy, 2010

The strategy recognizes climate change as a serious threat to sustainable development hence the need to develop modalities to ensure a climate resilient nation. The Policy seeks to assess the evidence and impacts of climate change in Kenya and recommend adaptation or mitigation measures necessary for minimizing risks associated with climate change. It further supports the development of relevant standards and regulations to mitigate the effects of climate change, which the physical planning handbook addresses.

Agricultural Sector Development Strategy, 2010-2020

The overriding goal of the strategy is to increase food security by increasing the productivity and competitiveness of agricultural enterprises and developing or managing key factors of production. It underscores the need to develop and prudently manage factors of production such as land, water and inputs to ensure that the cost and quality of production is within international standards. The handbook supports the provisions of the strategy by providing standards and guidelines for improving rangeland productivity, food production and infrastructure development.

National Forest Policy, 2020

The Policy provides a framework of standards and guidelines for improved forest governance, resource allocation, land tenure and land use, Disaster Risk Management and Climate Change. The Handbook provides standards and guidelines for the management and conservation of forests.

Kenya National Adaptation Plan 2015-2030

The Plan provides actions to address the country's vulnerability and resilience to climate change towards the attainment of Vision 2030. It recognizes that climate change is a cross-cutting sustainable development issue with economic, social and environmental impacts. This builds on the premise that all our socio-economic sectors are vulnerable to climate change impacts, although the manifestation of these impacts may vary from one sector to the other. The handbook mainstreams DRM and Climate Change adaptation across all sectors to enhance long-term resilience and adaptive capacity for the country.

Kenya Vision 2030

The Kenya Vision 2030 aims to transform the country into a newly industrializing middle-income country providing a high quality of life to Kenyan citizens by 2030. It is anchored on economic, social and political pillars. Under the current Medium-Term Plan III (2018-2022), the vision has been stepped down as the Big Four Agenda which focuses on food security, affordable housing, and manufacturing and affordable health care. The Handbook is an enabler in the realization of

the programmes encompassed in the policy by providing standards and guidelines for physical and land use plan preparation for the projects contained in the vision.

Sustainable Development Goals

The SDGs are a shared blueprint to achieve a better and more sustainable future for all by addressing global challenges including poverty, inequality, climate change, environmental degradation, peace and justice.

The handbook provides guidelines and standards for the achievement of goals on sustainable cities and communities, climate action, life below water, life on land, clean water and sanitation among others.

2.3 Legal framework

The main legal frameworks that guided the preparation of the handbook include:

Physical and Land Use Planning Act (PLUPA), 2019

The Physical and Land Use Planning Act, 2019 (PLUPA) is an Act of parliament that provides for the planning, use, regulation and development of land. It establishes planning authorities and institutions that are responsible for the preparation of various types of physical and land use plans and development control.

The handbook implements Section 10 of the Act which mandates the Cabinet Secretary to issue policy statements, guidelines and circulars on general and specific aspects of physical and land use planning. It's on the basis of the standards and guidelines in the handbook that the planning authorities can prepare physical and land use development plans and exercise their power on development control within their jurisdiction.

Environmental Management and Coordination Act, (1999)

The Act provides for environmental management and coordination matters through environmental impact analysis, environmental audit, environmental restoration and conservation orders. The legislation entitles every Kenyan the right to a clean environment and tasks the State to protect the environment and ensure sustainable use of land and other natural resources such as wildlife.

The planning handbook provides standards and guidelines for DRM and climate change adaptation to ensure environmental quality and protection of environmentally fragile areas as stipulated in the Act.

County Governments Act, No. 17 of 2012

The Act gives provision for county planning, outlined in part XI of the Act. It underlines the principles of planning, objectives of county planning, types and purposes of plans and public participation. These provisions of the Act form the basis upon which the handbook is prepared, to provide detailed guidance to physical and land use planning in the counties.

The National Construction Authority Act No.41 of 2011

The Act gives various functions to the National Construction Authority including overseeing the construction industry and coordinating its development countrywide, undertaking or commissioning research into any matter relating to the construction industry, and encouraging the standardization and improvement of construction techniques among others. The planning handbook provides standards and guidelines for all the developments to be undertaken in different areas as stipulated in the Act.

Urban Areas and Cities Act, No. 13 (Amendment) of 2019

The Act provides for the classification, governance and management of urban areas and cities; to provide for the criteria of establishing urban areas. It provides for the services necessary for the planning of urban areas. The handbook provides guidelines and standards for the provision of various services within urban areas and cities.

National Land Commission Act, No. 5 Of 2012

The Act provides for the management and administration of land in accordance with the principles of land policy set out in Article 60 of the Constitution and the national land policy. The guidelines and standards of the handbook will operationalize Section 5 of the Act which mandates the Commission to monitor and have oversight responsibilities over land use planning throughout the country.

Agriculture, Fisheries and Food Authority Act, (2013)

This Act provides the framework within which to make proposals on agriculture promotion and conservation of soils and fertility for sustainable agriculture and optimization of land use. This planning handbook provides guidelines for the utilization, protection, conservation and sustainable use and management of agricultural potential areas.

Water Act (2002)

The Act provides guidelines on plan proposals touching on management, conservation, use and control of water resources, water supply, and sewerage services. The handbook provides guidelines for the installation and distribution of water to ensure easy access and resilience of the infrastructure in case of disasters.

Mining Act, No. 12 of 2016

This is an Act of parliament that gives effect to Articles 60, 62 (1)(f), 66 (2), 69 and 71 of the Constitution in so far as they apply to minerals; provide for prospecting, mining, processing, refining, treatment, transport and any dealings in minerals and for related purposes. The mining activities from exploration, and exploitation to processing and refinement all happen on land which necessitates control and regulation. This shall be done through adherence to provided standards and guidelines on exploration, exploitation and processing activities as provided in the handbook.

The Forest Conservation and Management Act, No. 34 of 2016

This Act gives effect to Article 69 of the Constitution concerning forest resources to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes.

In compliance with the Act, the handbook provides standards and guidelines to conserve forests and maintain the minimum forest reserve areas at National and County levels and a programme for achievement and maintenance of tree cover of at least ten percent of the land area of Kenya.

Petroleum Act, No. 2 of 2019

This is an Act of parliament that provides a framework for the contracting, exploration, development and production of petroleum; cessation of upstream petroleum operations; to give effect to relevant articles of the Constitution in so far as they apply to upstream petroleum operations, regulation of midstream and downstream petroleum operations; and for connected purposes.

Standards and guidelines relating to the development of petroleum infrastructure such as pipelines and storage stations; environment, health and safety, and use of land for petroleum operations as provided in the Act, are mainstreamed in the handbook.

Maritime Zones Act, 2012

This is an Act of parliament seeking to consolidate the law relating to the territorial waters and the continental shelf of Kenya; provide for the establishment and delimitation of the exclusive economic zone (EEZ) of Kenya and provide for the exploration, exploitation and conservation and management of the resources of the maritime zones.
The physical planning handbook provides standards and guidelines to ensure that activities around these zones are coordinated and regulated, therefore, protecting maritime zones.

2.4 Institutional framework

Implementation of the handbook will require concerted efforts by various institutions which will play different roles as shown in Table 1:

Table 1: Implementing Institutions

INSTITUTION	**ROLE**
State Department for Physical Planning	Capacity building and technical support to County Governments and MDAs in the implementation of the handbook
	Preparation and implementation of National and inter-county Physical and Land Use Development plans and projects of National importance
County Governments	Preparation and implementation of County Physical and Land Use Development Plans
	Development control and enforcement
Municipal Boards/Town Committees	Preparation and implementation of Municipal/town Physical and Land Use Development Plans
	Development control and enforcement within their jurisdiction
Ministries, Departments and Agencies	Preparation and implementation of sectoral plans
National Land Commission	Oversight, monitoring and evaluation of the implementation of Physical and Land Use Development Plans prepared by the National and County Governments
Academic institutions	Training and research
Professional bodies	Developing appropriate procedures to guide physical and land use planning profession
	Training on Continuous Professional Development
Built environment practitioners	Execution of physical and land use planning consultancy services under the guidance of the handbook
Development partners	To understand what physical and land use planning function entails in order to guide their funding

Source: Physical Planning Team; 2022

CHAPTER 3: PHYSICAL AND LAND USE DEVELOPMENT PLANS

3.1 Overview

This section highlights the types and contents of plans as stipulated in the Physical and Land Use Planning Act No. 13 of 2019, general processes to be followed during plan preparation, presentation of maps, criteria for identification and mapping of stakeholders and modes of stakeholder engagement during plan preparation.

3.2 Types of Plans

The Physical and Land Use Planning Act No. 13 of 2019 prescribes the preparation of different types of plans which include:

1. National Physical and Land Use Development Plan (Section 21)
2. Inter-County Physical and Land Use Development Plan (Section 29)
3. County Physical and Land Use Development Plan (Section 36)
4. Local Physical and Land Use Development Plan. (Section 45)

Local Physical and Land Use Development Plans include:

a) An action/renewal/redevelopment plan for comprehensive planning of areas selected for intensive change, which is to commence within a specified period, by improvement, re-development or new development, restoration and re-use of derelict land;

b) An advisory plan/zoning plan indicating permitted subdivision and use of land specified in such plan;

c) A subject plan for a detailed treatment of a particular aspect of planning in relation to a part or the whole of a local physical development plan;

d) Part development plans, indicating precise sites for immediate implementation of specific projects or for alienation purposes. A Part Development Plan is prepared for purposes of land alienation, reservation of public land, regularization of existing county and national projects and for implementation of national, and inter-county strategic projects

3.3 Planning Process

The planning process is outlined below.

Step 1: Pre-planning

i. Planning needs assessment- Undertake planning needs assessment to identify the issues to be addressed by the plans, type of plans to be prepared and prepare the budget.
ii. Reconnaissance- Undertake a visit to the planning area to familiarize with the site

iii. Delineation of the planning area- to outline the extent of the planning area.
iv. Scoping-It involves scanning the planning area to determine the major issues and impacts that will be important in decision-making and need to be addressed by the plan. It clarifies the geographic and legal context. This will inform the formation of technical working groups and the identification of key local stakeholders and experts.
v. Preparation of the Terms of Reference- describing the objectives, scope (spatial and broad assignment activities), deliverables, timelines, team composition and qualification.
vi. Stakeholder map- list of all key stakeholders involved in the plan preparation process
vii. Notice of intention to plan- through a prescribed form as provided under PLUPA

Output: Concept paper and TORs

Step 2: Data Collection and Analysis

i. Literature review
ii. Primary data collection- preparation of data collection instruments, administering questionnaires and interviews (Key informant interviews and Focused Group Discussions), conducting transect walks and observing the environs.
iii. Data analysis and interpretation

Output: Survey report

Step 3: Visioning

i. Vision and objective setting- guide the community in deciding the future they want using break-out groups and vision cards.
ii. Stakeholder consultations

Output: Alternative models

Step 4: Draft physical and land use plan preparation

i. Alternative land use models
ii. Selection of preferred land use model
iii. Formulation of land use proposals- detailed land use plans, zoning regulations,
iv. Action area plans and strategies

Output: Draft physical and use development plan

Step 5: Notification of completion of the draft plan

i. Publication of a notice of completion of the draft plan in the Gazette, in at least two newspapers of national circulation and through electronic media.

Step 6: Plan validation

i. Presentation of the draft plan to the stakeholders for input.

Output: Draft physical and land use development plan

Step 7: Approval of the draft plan

i. Submission of the draft plan to the relevant planning authorities for certification, adoption and approval where applicable.

Output: Approved physical and land use development plan

Step 8: Notice of approval of the plan

i. Publication of a notice of completion of the plan in the Gazette, in at least two newspapers of national circulation and through electronic media.

A summary of the planning process is provided in Figure 2.

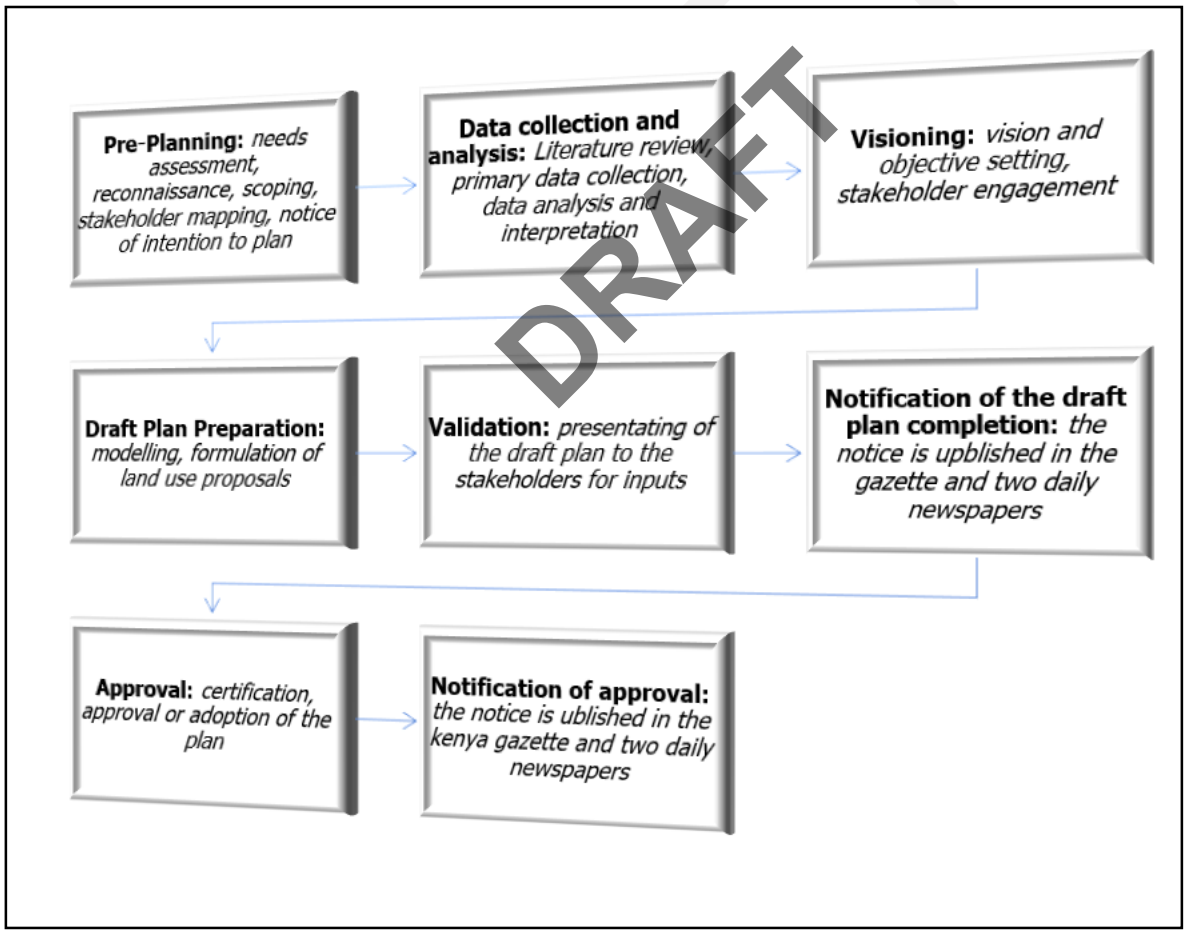

Figure 2: Summary of the planning process
Source: Physical Planning Team; 2022

3.4 Contents of Plans

The Physical and Land Use Planning Act No. 13 of 2019 and subsequent regulations provide guidelines on the structure and content of National, Inter-County, County and Local Physical and Land Use Development Plans.

3.4.1 National, Inter-County and County Physical and Land Use Development Plans

The guidelines on the National, Inter-County and County Physical and Land Use Development Plans are summarized in Table 2.

Table 2: National, Inter-County and County Physical and Land Use Development Plans

Part	Content
I	**Introduction** • Background of the Plan • Vision statement • Objectives • Scope of the Plan • Principles of the Plan • Methodology • Outline of the Plan **Planning Context** • Location-national, inter-county, local context • Legal and policy context
II	**Situational Analysis** • Population and demographic characteristics • Physiographic dynamics - • Land and land use analysis • Economy- industry, agriculture, commerce, mining and quarrying, fisheries • Transportation and communication • Infrastructural services • Urbanization • Rural developments • Housing • Environments • Climate change and Disaster Risk and Management (DRM) • Governance
III	**Synthesis** • Stakeholder engagement - Visioning, Goals and objectives setting • Development challenges, opportunities and alternative interventions • Summary of development issues, development scenarios/options, spatial concepts and concept plan

Part	Content
	Plan Proposals • National, Inter-County and County Structure Plan • Policy • Strategies, measures, Actions **Action Plans** • Develop action area/sector Plan
IV	**Monitoring, Evaluation and Implementation** • Develop a Capital Investment Plan • Develop Implementation Matrix • Develop a Monitoring and Evaluation Plan

Source: Physical Planning Team; 2022

3.4.2 Local Physical and Land Use Development Plans

The guidelines for the Local Physical and Land Use Development Plans are provided below:

i. Local Physical and Land Use Development Plans

Introduction

- Background of the plan.
- Vision
- Objective Statement
- Statements of the problem including, but are not limited to housing, unemployment, traffic congestion, pollution, land tenure, lack of services, terrain, soils and climate change.

Planning Context

- Location-national, inter-county, local context
- Legal and policy context
- Stakeholder engagement - Visioning, Goals and objectives setting

Analysis

- Spatial analysis accompanied by physical and land use and suitability maps and charts focusing on—
  - the terrain, soils and climate;
  - existing land uses and development;
  - potential pattern of development;
  - land tenure system; and
  - cadastral outlay of all development.

- Population analysis focusing on;
    - Population growth.
    - Migration.
    - Density.
    - Distribution, age and sex structure.
    - Household sizes.
    - Rates of household formation.
- Economic analysis focusing on;
    - Employment, incomes, and places of work.
    - Development trends and
    - Problems of service delivery.
    - Agricultural potential of the urban region.
    - Problems of transforming agricultural land into urban use.
- Contextual analysis
    - Peri-urban slum settlements and the problems they pose.
    - Potential, distribution and size of service centres within and outside the urban boundary.
    - Evaluation of urban boundary extension.
    - Evaluation of the importance of such factors as commerce and tourism within extended areas.
    - Historical patterns and conditions.
- Housing and infrastructure analysis
    - Housing occupancy rates, accommodation density, housing requirements, type of residential areas and industrial locations.
    - Housing and infrastructure programmes.
- Infrastructure analysis
    - Education.
    - Recreation areas and other public purpose land uses.
    - Power lines and way leaves.
    - Water and sewerage networks.
- Transportation and communication analysis
    - Roads networks, footpaths, cycleways, railway lines, depots, waterways, docks, etc.
    - Telephone lines.
- Climate change and Disaster Risk and Management (DRM)
- Governance

Projections

Land Use Projection Tables

Geographical Information System-based maps and modeling which include;

- Existing land use map
- Sieve maps of the physical and land use constraints or thresholds for development
- Development model map indicating land use designation and distribution as well as a clear transport and communication network

ii. Renewal and Re-development Plans

- Justification statement for eligibility of the areas as a substandard, decadent or blighted open area
- Project objectives including specifications of all proposed redevelopment and detailed job creation and retention estimates
- A financial plan including cost estimates and a project budget
- Site profiling and assessment including land protections and measures to address environmental or flood problems, conservation of areas of historic, and architectural significance
- Assessment of social and physical infrastructure
- Traffic impact assessment including safe pedestrian movement, access to buildings convenient and ample public car parks as well as efficient road links
- Public improvements including how the improvements will help achieve the objectives of the Plan
- A relocation Plan (where applicable)
- Redeveloper's obligations (restrictions that are or will be placed on owners of individual parcels)
- Disposition for each parcel including any known redeveloper
- A report on citizen participation describing meaningful citizen participation in the planning process and expected citizen participation during project execution

iii. Part Development Plan (PDP)/ Action area plans/ Advisory plans/ Subject plans

- Background information including the applicant, Land registration number, acreage, location, land use, ownership details
- Purpose and objectives
- Justification
- Legal and Policy framework
- Site analysis
- The plan
- Implementation framework

Preparation process for Part Development Plans (PDP)

1. A client will launch a request for the preparation of a PDP to the planning authority.
2. The planning authority seeks concurrence from the National Land Commission and other relevant agencies.
3. Preparation of the part development plan and the planning report by the Director in charge of Physical and Land Use Planning.
4. Advertisement and circulation of the PDP within sixty days.
5. Receive and incorporate comments.
6. Submission for approval to:

   i) County level (CECM in charge of Physical and Land Use Planning, County Assembly and Director General)

   ii) National level (Cabinet Secretary in charge of Physical and Land Use Planning)
7. Survey of the land
8. Submission of approved PDP and survey plan to the National Land Commission for issuance of Letter of Allotment.
9. Registration of the land.

NOTE: *An unapproved PDP will be valid for 18 months.*

3.5 Presentation of Maps

Physical and land use development plans should be GIS-based requiring land use information to be contained in a geodatabase that allows for ease of storage, retrieval, querying and presentation.

3.5.1 Scale of the Maps

National, Inter-County, County and Local context maps: These maps indicate relative contextual location and position of the planning area to match international standards. These are to be in the scale of:

- National context: 1:250,000
- Inter County and County context: ranges between 1: 100,000 and 1: 50,000;
- Local context is 1: 25,000;

Base Map - the map includes key physiographic and natural features such as rivers, wetlands, lakes, forests and hills, main man-made features such as trunk roads, railway lines, water reticulation facilities, termini, way leaves, and human settlements, urban nodes, contours among others. The maps prepared shall adopt a scale of a multiple of 500. The recommended scale ranges from 1:500; 1:1,000; 1: 2,500; and 1: 5,000. The choice of any of these scales should be guided by the level of detail the plan intends to portray.

Situational Analysis Context maps- to illustrate features and aspects of various thematic areas. The scale depends on the level of detail to be illustrated or presented. The recommended scales range from 1:10,000, and 1: 25,000.

Plan Proposals - These maps indicate the location of various Plan proposals. The scale depends on the level of detail required to be illustrated or presented. The recommended scales range from 1:10,000, and 1: 25,000

Action Plans - These maps indicate areas for detailed action. The scale of the maps depends on the area to be covered and particular aspects to be captured. The recommended scales range from 1:5,000 and 1:10,000.

Site Plans - A site plan is a type of drawing showing existing and proposed conditions for a given area. A site plan shows buildings, roads, sidewalks and paths/trails, parking, drainage facilities, sanitary sewer lines, water lines, lighting, landscaping and garden elements. The scale for a site plan depends on the size of the land and the paper size to be used. The recommended scales are 1:500, 1:1000, 1:1250, 1:2000, 1:2500 and 1:5000

PDPs- between 1:2500 and 1:5000

3.5.2 Plan Layout and Paper Size

The plan layout may take either a landscape or a portrait orientation, depending on the layout of the region. The A-series paper size of the plan layout shall depend on the scale, and the available plotter machine. The plan layout shall have the larger portion of paper i.e. not less than 75% - displaying plan details (drawing) and the remaining part, shall contain the legend information.

3.5.3 Land Use Colours and Codes

Land uses are classified into 10 broad categories, each requiring planning considerations. These include residential, industrial, education, recreation, conservation, public purpose, commercial, public utilities, transportation and agriculture. Each of these land use categories is assigned a colour code. Sub-codes can be created out of the main planning codes, to distinguish different categories of usage within the same class of land use.

Table 3: Recommended Land Use Colour Codes & Zones

Code	Zone	Zone Reference	Colour	*Shade*
0	Residential	High Density	Brown	
a.		Medium Density		
b.		Low Density		
1	Industrial	Heavy Industrial	Purple	
		Light Industries		
2	Educational		Orange	
3	Recreational		Green	
4	Public Purpose		Yellow	
5	Commercial	Commercial	Red	
		Business Cum Residential		
6	Public Utilities		*Blue*	
7	Transportation		Grey	
a.	Bus Park			
b.	Conservation			
c.	Agricultural			

Source: Physical Planning Team; 2022

Note: The following matrix indicates how to achieve the colour shades in table 5.1 through the combination of proportions (%) of Cyan, Magenta, Yellow, and Black (CMYK).

Table 4 : The recommended combination of colours (CMYK)

Code	Zone	Zone Reference	Colour	Cyan	Magenta	Yellow	Black
0	Residential	Low Density	Brown	8	12	20	0
		Medium Density		10	20	30	0
		High Density		20	30	40	0
1	Industrial	Heavy Industrial	Purple	10	50	0	0
		Light Industries		10	25	0	0
2	Educational		Orange	0	20	50	0
3	Recreational		Green	55	30	55	0
4	Public Purpose		Yellow	0	0	35	0
5	Commercial	Commercial	Reddish	0	60	60	0
		Business Cum Residential		0	40	40	0
6	Public Utilities		Blue	80	60	0	0
7	Transportation		Grey	0	0	0	20
	Bus Park				0		30
8	Conservation			20	0	20	0
9	Agriculture		Pale yellow	15	0	25	0

Source: Physical Planning Team; 2022

Note: Waterbodies can be shown by a lighter shade of blue.

Table 5: Recommended combination of Colours (RGB)

Number	Land Use	Red	Green	Blue	Colour
0	Residential	215	194	158	brown
1	Industrial	197	0	255	Purple
2	Educational	255	170	0	Orange
3	Recreation	163	255	115	Green
4	Public purpose	255	255	0	Yellow
5	Commercial	255	0	0	Red
6	Public utilities	0	112	255	Blue
7	Transportation	20% grey or fill #CCCCCC or stroke #ffffff			Grey
8	Conservation	255	255	190	Pale green
9	Agricultural	255	255	230	Pale yellow
10	Mixed Use (Light Industry, Commercial and Residential)	bevel with #000000			As per the dominant user

Source: Physical Planning Team; 2022

Note: *CYMK is the best colour profile to use when designing for a printed format while RGB colour mode is suitable for screen display.*

3.5.4 Legend

Explanation of Symbols used – should be listed in the following order; point features, line features, and area features. The order shall always be, natural features (base elements), followed by the themes being mapped.

Land Use Categories – should be shown according to planning codes. It is also recommended to create sub-codes out of the main planning codes e.g. residential may have low, medium and high-density codes - that will be displayed using shades of brown.

Details of Preparing & approving Authority- National, Inter-County, County and Local plans should have specifications on: name of the county; department preparing the plan; the certifying authority; approving authority at the lower section of the Legend.

Other information that should be included in this section include: scale used; north arrow; date of completion; plan reference number (always unique to each plan) and approval number.

TITLE

CERTIFICATE

I certify that the plan has been prepared and published as per the requirements of the Physical and Land Use Planning Act No. 13 of 2019

Name of Registered Physical Planner .....

Registration Number .....

Signature ..... Date .....

AMENDMENTS

1.	
2.	

ZONE	LAND USE	COLOUR	AREA IN HA
0	RESIDENTIAL		
1	INDUSTRIAL		
2	EDUCATIONAL		
3	RECREATIONAL		
4	PUBLIC PURPOSE		
5	COMMERCIAL		
6	PUBLIC UTILITY		
7	TRANSPORTATION		
8	CONSERVATION		
9	AGRICULTURAL		

COUNTY GOVERNMENT OF (name of county)

DEPARTMENT OF LANDS AND PHYSICAL PLANNING

Name of urban area/town/city

LOCAL PHYSICAL & LAND USE DEVELOPMENT PLAN

	Scale:
	Date:
	Prepared By:
	Drawn By:
DEPARTMENTAL REFERENCE No.	
CERTIFIED: County Director of Physical Planning SIGNATURE…….. DATE……	
RECOMMENDED: SIGNATURE…….. DATE…… CECM in charge of Lands and Physical Planning	
APPROVED: SIGNATURE…….. DATE…… Clerk to County Assembly	
ENDORSED: SIGNATURE…….. DATE…… H.E the Governor	
APPROVED DEVELOPMENT PLAN No.	

Figure 3: Legend Sample: Local Physical and Land Use Development Plan
Source: Physical Planning Team; 2022

Proposed site + Grids & contours		Proposed site for ……. (approximate size in ha)
	CERTIFICATE I certify that the plan has been prepared and published as per the requirements of the Physical and Land Use Planning Act No. 13 of 2019 Name of Physical Planner …… Registration Number …… Signature …… Date ……	
		AMENDMENTS
	1. 2.	
	MINISTRY OF LANDS AND PHYSICAL PLANNING State Department for Lands and Physical Planning	
	Name of urban area/town/city	
	PART DEVELOPMENT PLAN	
		Scale:
		Date:
		Prepared By:
		Drawn By:
	DEPARTMENTAL REFERENCE No.	
	CERTIFIED BY SIGNATURE……. Date……. Director General	
	APPROVED BY SIGNATURE……. Cabinet Secretary Ministry of Lands and Physical Planning Nairobi Date……	
	APPROVED DEVELOPMENT PLAN No.	

Figure 4: Legend Sample of a Part Development Plan -National Government
Source: Physical Planning Team; 2022

<table>
<tr><td rowspan="11">Proposed site + Grids & contours</td><td colspan="2"></td><td>Proposed site for …… (approximate size in ha)</td></tr>
<tr><td colspan="3">CERTIFICATE

I certify that the plan has been prepared and published as per the requirements of the Physical and Land Use Planning Act No. 13 of 2019
Name of Physical Planner ……

Registration Number ……

Signature …… Date ……</td></tr>
<tr><td></td><td colspan="2">AMENDMENTS</td></tr>
<tr><td>1.

2.</td><td colspan="2"></td></tr>
<tr><td colspan="3"></td></tr>
<tr><td colspan="3">MINISTRY OF LANDS AND PHYSICAL PLANNING

State Department for Lands and Physical Planning

COUNTY GOVERNMENT OF ……</td></tr>
<tr><td colspan="3">Name of urban area/town/city</td></tr>
<tr><td colspan="3">PART DEVELOPMENT PLAN</td></tr>
<tr><td colspan="2" rowspan="4"></td><td>Scale:</td></tr>
<tr><td>Date:</td></tr>
<tr><td>Prepared By:</td></tr>
<tr><td>Drawn By:</td></tr>
<tr><td colspan="3">DEPARTMENTAL REFERENCE No.</td></tr>
<tr><td colspan="3">CERTIFIED BY
SIGNATURE…… Date…….

County Director of Physical Planning</td></tr>
</table>

	RECOMMENDED BY SIGNATURE……. Date……. CECM, Lands
	1st APPROVAL BY HANSARD NO ……Date……. County Assembly
	COUNTY PLAN APPROVAL NO. …….
	CERTIFIED BY SIGNATURE……. Date……. Director General
	APPROVED BY SIGNATURE……. Cabinet Secretary Ministry of Lands and Physical Planning Nairobi Date……
	APPROVED DEVELOPMENT PLAN No.

Figure 5: Legend Sample for Part Development Plan - County Government
Source: Physical Planning Team; 2022

3.5.5 Grids

Grids are very important for referencing features on the plan, and as such, all National, Inter-County and County plans shall have a network of grids with values indicated along the neat line. This may take the form of a full grid, or ticks indicated on the space between the neat line and the borderline.

3.5.6 Location Plan

There shall be a location map at the top left corner of the plan to show the planning sites' position in relation to abutting areas.

3.6 Public Participation

It's a deliberate and interactive process by which stakeholders are actively involved in the plan making process to influence decisions and outcomes of the planning process. This is done during preparation, implementation, monitoring and review stages.

3.6.1 Criteria for identification and mapping of stakeholders

The following criteria should be used to identify and map stakeholders

1. **Influence**: Organizations and individuals that substantially influence preparation and implementation.
2. **Partnership**: Opportunities for building partnership relations between the project developer and a given social group in the framework of the project implementation
3. **Dependency:** Groups significantly affected by the implementation of the provisions of Physical and Land Use Development Plans
4. **Representation:** Individuals representing interests with regards to the provisions of Physical and Land Use Development Plan.
5. E**xpressed interest:** Individuals and social groups that express interest in the implementation as they are directly or indirectly affected by related operations

Table 6: Categories of Stakeholders

CATEGORY	EXAMPLES
Registered property owners	Individuals, companies and institutions
Inter-Governmental Organizations	World bank, UN-Habitat, Food Agriculture Organization, European Union
Constitutionally elected leaders	Members of Parliament, Members of County Assembly, Governors, Senators, woman representative
Defined vulnerable groups	Elderly, People abled differently (PAD), women headed households, low-income groups, unemployed, youth
Service providers	Kenya Power, Water and Sewerage companies, Communication companies transport operators/logistics
State Actors	County Governments, Ministries, Departments and Agencies
Professional bodies	Architectural Association of Kenya, Kenya Institute of Planners, Town & County Planning Association of Kenya
Regulatory boards	Physical Planners Registration Board, Law Society of Kenya, Engineers Board of Kenya
Individuals with business interests	Small Medium Enterprises, investors, Business community, community-based organizations
Representatives of private sector	chambers of commerce, private sector foundation, producer cooperatives, representatives of informal sector, neighbourhood associations
Professions in the built environment	Planners, Engineers, Architects, Valuers, Environmentalists, Urban designers, Surveyors

CATEGORY	EXAMPLES
International and Regional agencies	East Africa Community, United Nations, Institute for Transportation and Development Policy, United States Action Aid fund
Civil society	Registered faith-based, community-based institutions and Non-Governmental Organizations
Academia	Universities, Kenya Agriculture and Livestock Research Organization (KALRO), Kenya Forest Research Institute, Kenya Marine and Fisheries Research Institute
Local leaders and opinion leaders	Chiefs, village elders, influencers

Source: Physical Planning Team; 2022

3.6.2 Modes of Stakeholder Engagement

Methods of informing the public on stakeholder engagement include: memoranda, social media, advertisements, press conferences, talk shows, Gazette notices, Newsletters, displays, posters, exhibitions and brochures.

Engagement of stakeholders will take the form of: Focus Group Discussions, town hall meetings, Stakeholder forums (workshops), virtual meetings, public hearings, consultative fora and public fora. The engagement is informed by the type of plan, context, tools and methodology.

3.6.3 Institutional Linkages

Preparation and approval of plans require linkages with institutions that have a stake in the plan and/or may have relevant information. This is done through plan circulation, public notices, gazette notices, consultative meetings, and stakeholder participation. The capacity of the institutions needs to be enhanced and coordinated for the efficient performance of their functions.

CHAPTER 4: DEVELOPMENT CONTROL

4.1 Overview

Development control is the process of managing or regulating the carrying out of any works on land and ensuring that operations on land conform to spatial development plans as well as policy guidelines, regulations and standards issued by the planning authorities. The Physical and Land Use Planning Act (PLUPA), 2019 highlights the provisions for Development Control in Part IV and Third Schedule. These sections together with the Physical and Land Use Planning Regulations, 2021 provide for the objectives of development control, types of development applications, prescribe the authorities involved, processes and procedures, considerations for development applications, penalties and the various forms to be used in administering development control. The various types of development applications include; change of use, extension of use, subdivision scheme and amalgamation proposals, building plans, processing of easements and way-leaves, and citing of facilities such as institutions, and petrol stations among others.

4.2 Principles of Development Control

Development control is a tool of physical and land use planning that ensures:

- **Accessibility:** all developments must have adequate access.
- **Aesthetics:** developments should be organized in a visually appealing manner.
- **Compatibility:** land use activities should co-exist in harmony.
- **Health, Safety and Welfare:** All developments should ensure the safety and welfare of the users.
- **Resilience:** All physical and land use development plans must promote the ability of developments to recover and adapt quickly from a disaster with ease
- **Sustainability:** Protection, conservation and utilization of resources without compromising the needs of the future generation should be upheld

4.3 Objectives of Development Control

The general objectives of development control are: -

1. To ensure that the implementation of physical development projects conforms with the approved physical development plan.
2. To enforce actions in case of contraventions against plan proposals and/or development standards.
3. To promote public safety and health.

4. To protect and conserve the environment.
5. To ensure that planning regulations, standards, and procedures are reviewed from time to time to manage emerging concerns and resolve conflicts
6. To secure optimal use of land and ensure that planning decisions are rational
7. To ensure orderly and planned building developments, design, construction, operation and maintenance
8. To promote public participation in physical and land use development decision-making

4.4 Development Control Process

The development control process in Figure 6 outlines the general framework for processing development applications while Table 7 indicates the process for the various aspects of development control, their requirements, the approving authority and other relevant authorities.

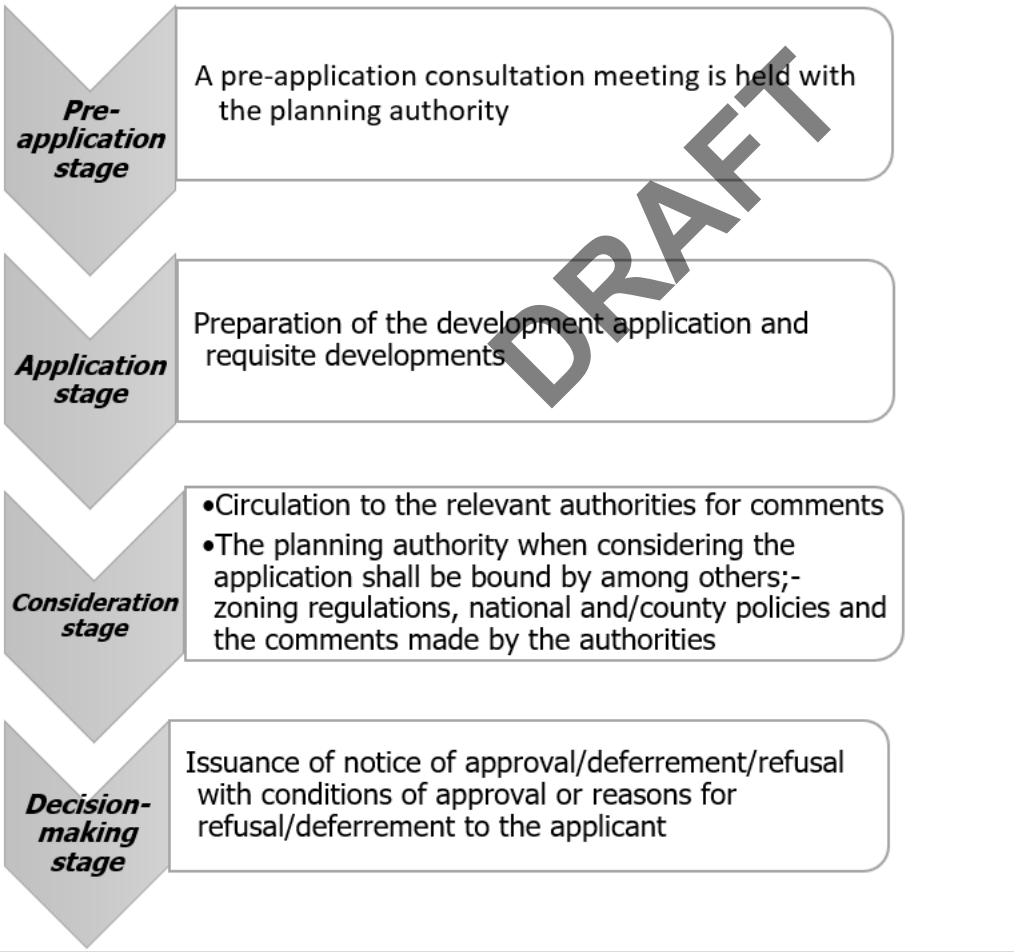

Figure 6: Development Control Process
Source: Physical Planning Team; 2022

Table 7: Development Control Process

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies

Change of Use/Extension of Use/Extension/ Renewal of Lease	• Application of development permission
	• Issuance of submission certificate with a tracking number by the County Director of Physical Planning
	• Circulation of the application to technical officers of the relevant authorities and agencies for review and comments and submission of the comments within fourteen days
	• Analysis of the comments received during circulation and submission of the report to the CECM by the county director of physical and land use planning
	• Decision-making by the CECM on the development application and communication of such decision to the applicant
		• Completed application for development permission form.
		• A certified copy of the Title Deed, Certificate of Lease or any other legal ownership documents.
		• A current search certificate of the property.
		• A certified copy of a land rate clearance certificate.
		• A geo-referenced cadastral map.
		• A location plan based on an up-to-date survey plan clearly indicating the subject area.
		• Notice published in at least one newspaper of nationwide circulation
		• A planning brief of the comprehensive development prepared by a registered and practicing
			Cabinet Secretary /CECM of physical and land use planning	• National Environment Management Authority (NEMA)
				• National /County Departments
				  ○ Environment and disaster management
				  ○ Survey
				  ○ Agriculture, fisheries and livestock
				  ○ Land administration
				  ○ Water and Sewerage
				  ○ Public health

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
		physical and land use planner. • A caption of an on-site notice inviting comments from the members of the public • Proof of payment of relevant fees		
Sub-Division/ Amalgamation	• Application for development permission • Circulation to the relevant authorities or agencies to review and comment (7 days from receipt of the application) • Submission of comments to the agencies/authorities (within 14 days from the date of circulation) • Decision-making on the application	• Completed application for development permission form. • Copies of subdivision scheme plan prepared and signed by a registered planner • A geo-referenced cadastral map. • Certificate of current official search or any other evidence from the respective Land Registrar • Copy of survey plan • Ownership documents • Proof of payment of fees & charges. • Topo-survey	Cabinet Secretary / The County Executive Committee Member	• Relevant National/County Departments • Survey • Agriculture, Fisheries and Livestock • Land Control Board • County Land Administration Officer

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
Building plans	• Application of development permission by the project proponent or his/her agent through a prescribed application form. Upon submission of the application, the applicant is issued with a submission certificate with a tracking number by the county director of physical and land use planning • Payment of the prescribed fees by the applicant • Registration of the Development Application, which is done upon confirmation of the receipt of the application fees i. Circulation of the application to the relevant authorities and agencies to review and comment ii. Authentication of Registered Architects/Engineers Professionals certificates	• Approved Physical & Land Use Development Plan and drawings • Architectural drawings and specifications • Civil and structural engineer's drawings and specifications • Electrical engineer's drawings and specifications • Mechanical and plumbing engineer's drawings and specifications • Geotechnical survey report • Indemnity Form • Land ownership documents • Proof of payment of the prescribed fees • Architectural and structural drawings prepared by a Registered Practising architect/Structural Engineer • Quarterly project implementation reports of	Cabinet Secretary in charge of Planning / respective County government CECM	• Relevant County Departments • Environment • Engineering/Public Works • Survey • Public health • Public works • NEMA (National Environment Management Authority) • NCA (National Construction Authority) • KENHA • KURA

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
	iii. Receipt of feedback/comments from the relevant authorities and agencies iv. Decision-Making and Issuance of Development Permission v. Authorization from NCA vi. Project commissioning vii. Request for inspection: The registered owner of a property or duly authorized agent shall send written notification, in a prescribed form, to the Director General or the County Director of Physical & Land Use Planning requesting for inspection during the commencement and subsequent stages of the project viii. Routine Inspection of the building and works by the relevant authorities/agencies	professional undertaking from the Registered Architect/ Structural Engineer • Structural integrity Reports		

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
	ix. Issuance of certificate of compliance and notice for issuance of certificate of occupation. This is done upon conducting the joint final inspection of all the relevant authorities and agencies			
Outdoor Advertisements	1. Application for advertisement, to the CECM. 2. Pre-vetting and issuance of submission certificate by the county director of Physical & Land Use Planning 3. Circulation of the application to the relevant agencies/authorities for comments (within fourteen working days) 4. Decision-making on the application and communication to the applicant	For the billboards, beam advertisements, sky signage or wall wrap: ● A planning report prepared by a registered physical planner ● A geo-referenced plan indicating the location of the site, architectural plans prepared by a registered architect ● Structural designs with calculations prepared by a registered structural engineer and accompanied by a duly filled indemnity form ● Geotechnical survey where applicable prepared by a registered geologist or its equivalent to	CECM responsible for Physical and Land Use Planning in the respective County	● Relevant National/County Government Departments ● Environment ● Engineering/Public Works ● Water & Sewerage ● Public health ● Public works ● NEMA (National Environment Management Authority) ● NCA (National Construction Authority) ● KENHA ● KURA ● KERRA (Kenya Rural Roads Authority ● National Museums of Kenya

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
		ascertain the structural integrity of the foundation and in the case of wall wraps and sky-signs the integrity of the building • The design and content of the advertisement • Proof of payment of stipulated fees • Photo montage of the advertisement against its background • Ownership documents including a copy of the title deed, certificate of lease or title; • Recommendation to site a billboard on a road reserve from the relevant road authority or agency; for a beam advertisement, • An environmental and social assessment license • Any other supportive document as may be required by the County Director		• Kenya Airports Authority • Kenya Civil Aviation Authority • Communication Authority of Kenya

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
		• Directional sign, signage or wall branding • The location plan; • A geo-referenced plan showing the location of the site • A sample of the advertisement • A photograph of the building if it is being advertised on the building • Payment of relevant fees & charges; • For other advertisements: • The design and content of the advertisement: • A map of the area of the advertisement		
Strategic National Projects	1. submission of the development application 2. circulation of the application by the director general to the relevant authorities for comments	All plans should be Georeferenced Any digital plans should; • Have an electronic signature of the author of the plans	The Cabinet Secretary in charge of physical planning	Relevant authorities/agencies • CECM responsible for Physical and Land Use Planning in the respective County • Chief Architect responsible for National Public Works

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
	3. submission of the comments by the agencies/authorities to the Director-General (within thirty days) 4. Publication of notice of intention to plan in at least two newspapers of nationwide circulation (in both Kiswahili and English) and on electronic media by the Director General. 5. Receipt of the comments from the public through various means including public hearings (thirty days) 6. Review of the comments received from the public by the technical committee constituted by the Director General 7. Preparation of technical advisory report by The Director General which is then submitted to the cabinet secretary within thirty days	• be in PDF format • not be password-protected • be capable of being reproduced in A4 paper size while retaining sufficient accuracy and detail • be limited to 25 Mb per file except for geo-database or spatial data • have images with resolution not less than 1200 dots per inch		• Chief Engineer responsible for National Public Works • Chairman, NLC • Executive Director, NCA • Director General NEMA • Director General Medical Services • Director General –for the relevant road authorities • Kenya Railways Corporation Managing Director • Director General, Kenya Civil Aviation Authority • Kenya Airports Authority Managing Director • National Director of Surveys • National Director of Land Administration • Chairperson of the Community Land Management Committee in the relevant county

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
	8. Decision-making on the communication of the decision by The Cabinet Secretary within seven days. 9. Publication of a notice of approval or rejection by the Cabinet Secretary in at least two newspapers of nationwide circulation (both Kiswahili and English)			

Developments around Strategic Installations	**Preliminary application**
	1. Submission of an application for development permission in the area adjoining a strategic installation.
	2. Within fourteen days after receiving the application, the CECM issues a written advisory or refers it to the Director-General for verification of compatibility with the development plan of the strategic installation
	3. The CECM transmits a copy of the application to the head of the relevant ministry, department or
		Concept note and preliminary plans
		The plans should be georeferenced
		Documents submitted in electronic form should:
		• be in PDF format
		• not be password-protected
		• not have hyperlinks
		• be capable of being reproduced in A4 size paper without losing accuracy
		• be limited to 25 mb per file except for a geo-database or spatial data document.
			The County Executive Committee Member	• Cabinet Secretary/CECM Lands
				• Director General of Physical Planning
				• NEMA
				• Relevant County Government Departments
				  • Environment and disaster management
				  • Survey
				  • Agriculture, fisheries and livestock
				  • Land administration
				  • Water & Sewerage

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
	agency responsible for the strategic installation. 4. If the applicant does not receive an advisory within seven days after submitting the application to the CECM, the applicant submits the application for development permission **Application for development permission** 5. Submission of the detailed application to the County Executive Committee Member and payment of the prescribed fees 6. circulation of the application to the relevant authorities and agencies for comments within fourteen days 7. review of comments received from the relevant authorities/agencies by the director general to the CECM within fourteen days	Each digital plan contained in the application should embed an electronic signature or a manual signature on a document that is scanned, and have images with a resolution of at least 1,200 dots per inch • Security impact assessment • Safety impact assessment • Landscape & visibility impact assessment		• Public health

Type of Development Control	Process	Requirements	Approving Authority	Relevant Authorities & Agencies
	8. Decision-making on the development application by The CECM who then notifies the applicant and the relevant MDAs of the decision Any person aggrieved by a decision of the CECM may appeal in writing to the County Physical and Land Use Planning Liaison Committee within fourteen days after the decision			

Source: Physical Planning Team; 2022

NOTE: In case of refusal to grant development permission the applicant may appeal to the National / County physical and land use planning liaison committee. In case the aggrieved party is dissatisfied with the decision of the committee he may appeal to the Environment and Land Court.

4.4.1 Guidelines for approval of Change of User/Extension of User/Extension of Lease

- An approved physical and land use development plan of the area
- Consider the area zoning regulation and compatibility of new use/density to the adjacent developments.
- Consider accessibility, size of road and circulation of traffic
- Land Reference and title where applicable
- Current use of the land
- Proposed/intended use
- Require an Environmental Impact Assessment for developments that may have a negative impact on the environment
- Ensure that the subject land has been developed for the intended use prior to the approval of extension/renewal of lease,
- Prepare a layout plan for the area intended for change of use/ density, Extension of lease and Extension of Use
- The special conditions attached to the lease have been fulfilled
- Consider the implications of the proposed development on infrastructure services such as roads
- Ensure a planning brief is prepared

4.4.2 Guidelines for approval of Subdivisions and Amalgamations

- An approved physical and land use development plan of the area
- Consider the area zoning regulation and compatibility of new density to the adjacent developments
- Ensure surrender of land for public utilities/purpose where applicable

    i. The layout plan of the area under consideration for subdivision or amalgamation should have the following:

        - Plan title
        - Location plan/an inset
        - Scale, date, northing, a georeferenced grid system.
        - Size of the property and the size of the resultant subplots
        - Linkage and indication of classified roads to enhance adequate accessibility

- Highlight of subject property
- Subplots and access to the property in relation to the neighbourhood
- Adequate truncations
- Appropriate size, shape, plots at right angle with the road
- Legend set on the right or bottom and contains the following:
    - Property reference
    - Name, signature and post office number/address of the owner of the property
    - Licensed planner's registration number, seal and signature

i. Date and scale approval section by the cabinet secretary/county executive committee member

ii. For comprehensive schemes, large-scale subdivisions need to be subjected to planning, topo-cadastral survey and application of the principles of neighborhood planning. The resultant population needs to be provided with public facilities such as:

- Green spaces
- Education facilities
- Access roads
- Water, sewerage and drainage system
- Recreational facilities

4.4.3 Comprehensive Land Subdivision

Standards and Guidelines

- Maintain a road hierarchy of;

    i. Distributor- 15M

    ii. Secondary – 12M

    iii. Access roads- 9M

    iv. Cul de sacs- should not exceed 90M in length.

- Provide road breakage of 2 to 4m (footpaths) after every eight plots
- Retain the existing character if desirable

- All proposed roads should have truncations
- Encourage T junctions and discourage cross and Y junctions
- Integrate social amenities in subdivision schemes

4.4.4 Guidelines for Approval of Building Plans

- Ensure conformity to physical and land use development plans and the zoning regulations
- Consider compatibility and use of the building in relation to the neighbourhood.
- Consider the siting of the building
- Ensure building lines/setbacks and frontages are observed
- Check for elevations, height and the plinth area of the building
- Consider the design, shape, civic design, facade and appearance of the building
- Observe plot coverage and plot ratio
- Examine the adequacy of accessibility within the plot
- Service area
- Canopies and projections
- Access, parking and loading bays
- Provision for rainwater harvesting facilities and water storage tanks in every building should be encouraged.
- Consider if the proposed plan has indicated the location of infrastructure (sewer, electricity, drainage, water)
- Ensure landscaping and greening have been provided.
- Ample ventilation and lighting
- Environmental, health and cultural considerations.

4.4.5 Guidelines for Preparation of a Planning Brief

A planning brief shall be required during the submission of change of user, extension of user, extension or renewal of lease, subdivision or amalgamation and site plans.
A planning brief shall include the following

i. Introduction

ii. Legal and policy framework

iii. Scope

iv. Situation analysis/ the existing conditions

v. Analysis of impacts of the proposed development

vi. Justification

vii. Plan proposals

viii. Conclusion

ix. Recommendations

x. Attachments- certified copies of the ownership documents and official search, notices, location plan, scheme plan, circulation correspondences, land rent and rates clearance certificates

4.4.6 Mixed Use

Mixed-use is a type of development that provides more than one compatible use/ purpose within a shared building or development area. Mixed-use development is an attempt to increase the efficiency of land-use structures and improve transportation at the city-wide level. Mixed-use projects may include a combination of housing, medical, commercial or industrial components. They may be referred to as heterogeneous developments.

Categories of mixed land use development

Categories of mixed land use development include:

- Vertical Mixed-Use Development combines different uses within the same building as shown in figure 7.
- Horizontal Mixed-Use Development consists of single-use buildings within a mixed-use zoning area, which allows for a range of land uses in a single development project.

General Standards and Guidelines

- Promote mixed-use development through;
    i. Zoning areas of low, medium and high residential density in a comprehensive development
    ii. Allowing for commercial, and educational, uses in a multi-story residential building
    iii. Allowing for non-polluting small-scale industrial land use within residential or commercial area
- Provide transition areas – separate uses with landscaping, screening, buffer zones and setbacks

- Encourage the provision of open/green spaces
- Ensure dominant land uses retain the character of the areas
- Provide social and physical infrastructure such as water, waste treatment and transportation in physical and land use development plans for the mixed-use development indicate
- Prohibit any trade or activity involving any kind of obnoxious, hazardous, inflammable, non-compatible and polluting substance or process

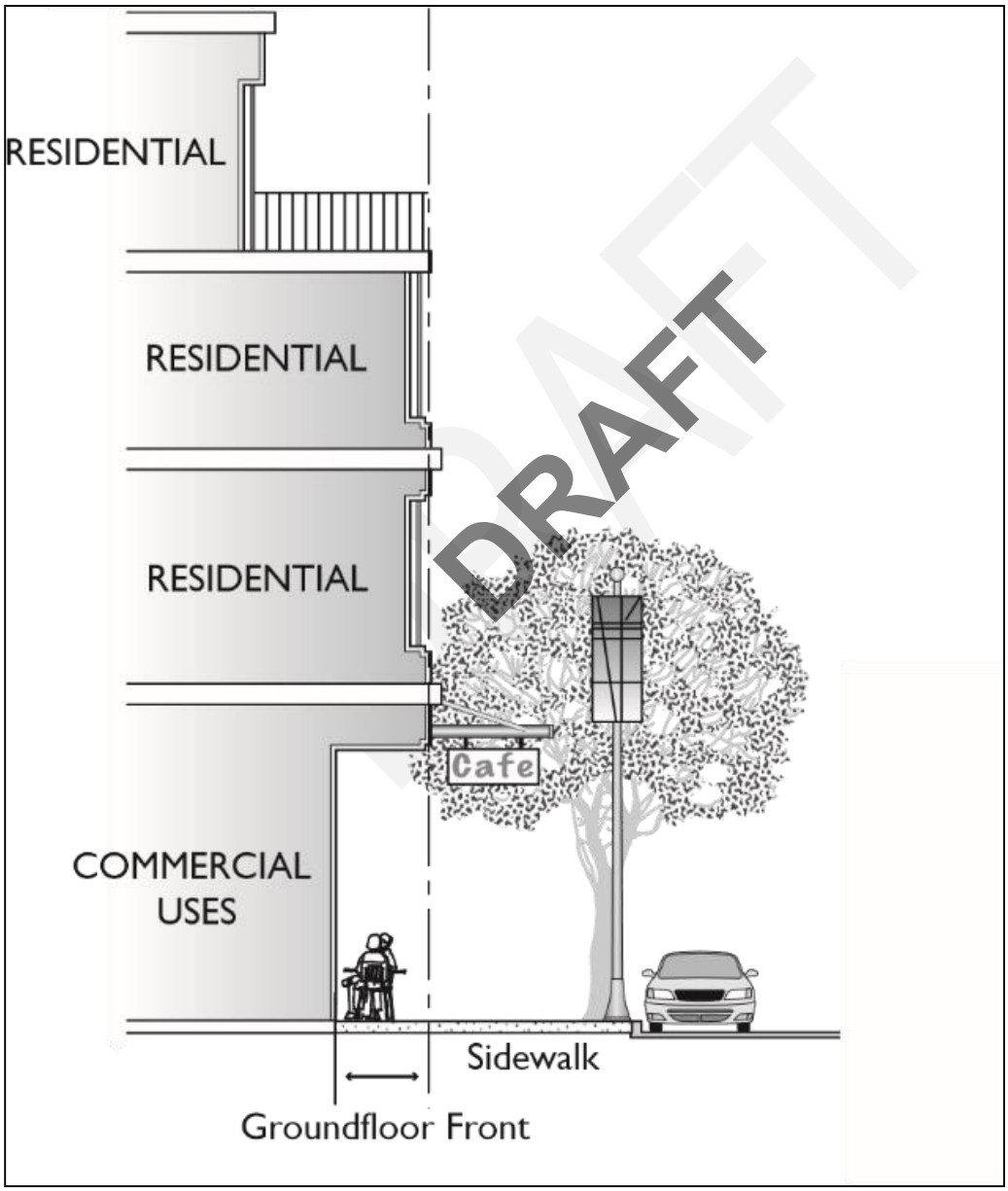

Figure 7: Vertical mixed-use model
Source: Planning team, 2022

CHAPTER 5: PLANNING STANDARDS AND GUIDELINES

Overview

This chapter seeks to provide planning standards and guidelines for the various planning themes discussed. The thematic areas provided for include: Agriculture, Blue Economy, Natural resources and Environment, and Physical and Social Infrastructure among others. Disaster Risk Management and Climate Change Adaptation measures for every sector are also included.

5.1 Agriculture

General Standards and Guidelines

- Cultivation on slopes:
    - From 0% to 12% contour farming and soil conservation measures are encouraged.
    - Slopes of12% to 55%; one is obliged to apply soil conservation measures;
    - Above 55%, land should be used for perennial/permanent crops/forests.
- Establish buffers between farms and other land uses to minimize land use conflicts as shown in the table below:

Table 8: Buffer for various land uses

Land Use/ User:	**Width of Buffer:**	**Mandatory institution for circulation:**
Forests	12m road	KFS
Military/ security installations	There should be a buffer to be determined on a case-to-case basis depending on the use of the security installation	DOD
Power installations	10-60m depending on the KV	Kenya Power/ KENGEN/ KETRACO
Dams	To consult WRA	WRA
Airports	Depends on the nature of farming. Not allowed if it attracts birds.	KAA/ KCAA
Major transportation corridors (such as railway lines)	60-120m	KRC/ KENHA
Oil and gas pipelines	60m	KPC

Source: Physical Planning Team; 2022

- Refer to the National Spatial Plan (NSP) on the potential agricultural zones/areas during plan preparation and allocation of agricultural uses.
- Prepare county physical and land use development plans and designate different agricultural zones including sites for collection centres, agro-based industries and agricultural tourism.
- Delineate urban growth limits to discourage conversion of agricultural land to other land uses and protect grain basket areas as well as other high potential areas.
- The minimum land size allowable for buying centres and collection points for tea, coffee and sugar is 0.1Ha and should accommodate basic facilities such as washrooms
- The minimum size of land should be based on the agro-ecological zone as indicated below:

Table 9: Minimum Land Sizes for Agricultural Land

Agro-ecological zone	**Minimum land size (Ha) (commercial)**	**Minimum land size (Ha) (small scale)**
Low potential area	20	5
Medium Potential area	10	2
High potential area	5	0.5

Source: Physical Planning Team; 2022

- Set aside land 5-10 ha for demonstration farming.
- Plan for eco-villages and resilient urban centres within agricultural areas.
- Designate hilly areas with stony shallow soils as conservation areas.
- Designate sites for harvesting and storage of rainwater for agriculture.
- Locate buying centres centrally and away from junctions.
- Designate a minimum of 5km width for wildlife corridors.

5.1.1 Plantation Farming/Estates

Standards and Guidelines

- The minimum land size should be 20ha in high agricultural potential areas
- Provide minimum access roads of 12m to the farms and market centres
- Provide corridors for livestock and wildlife where necessary

- Prepare site plans designating residential quarters complete with amenities such as schools, clinics, water and sanitation facilities.
- Designate space for processing plant, machinery parking yards and garages
- Preserve and ensure access to cultural and public utility sites

5.1.2 Horticulture Farming
Standards and Guidelines

- The minimum land size should be 0.25ha
- Site plans must be prepared for horticulture farms of over 5 ha.
- Designate sites for the disposal and management of agricultural waste.

5.1.3 Fish Farming
Standards and Guidelines

- Designate potential areas for fish farming when preparing the county physical and land use development plans
- Plan, designate and zone fish caging areas in water bodies
- Prepare site advisory plans for the fishing zones
- Designate sites for fish cooling and processing plants
- Designate sites for the disposal and management of waste
- Detailed guidelines are provided in the Aquaculture Handbook

5.1.4 Urban and Peri-Urban Agriculture
Standards and Guidelines

- Promote urban agriculture through building designs e.g., flat roof designs
- Minimum land sizes for urban agriculture should be 0.1ha within residential areas and institutions
- Encourage sustainable water harvesting and conservation
- Encourage greenhouse technology in peri-urban areas
- Encourage onsite waste management
- Restrict farming activities to enclosed boundaries and away from ecologically fragile areas

- Prohibit agriculture in areas subject to health hazard environments such as solid waste collection points, sewer lines and drainage channels. Table 10 indicates the minimum plot sizes for permissible urban agriculture

Table 10: Urban agriculture permissible uses

Minimum plot size	**Land use Activities**
0.06 Ha	Vegetable farming including sack gardens
0.1Ha	Dairy keeping, Chicken rearing
0.2Ha	Apiculture in peri-urban areas

Source: Physical Planning Team; 2022

5.1.5 Livestock and Ranching Standards and Guidelines

- Observe a minimum land size of 50ha in ranching areas
- Observe stocking unit (livestock intensity/density per unit area in hectares) whereas stocking unit is equivalent to a mature zebu cow weighing 300kg or 7 sheep or 7 goats
- Inventorize, map and register community-grazing areas as per Table 11 below.

Table 11: Agro-Ecological Zones

Code	**Zone**	**Stocking Rate (Lu/Ha)**
UH1	Sheep Dairy Zone	0.3
UH2	Pyrethrum Zone	0.4
UH3	Wheat/Barley Zone	0.4
UH4	Ranching/Barley Zone	0.8
UM2/UM3	Coffee Zone	1.1
UM4	Upper Sisal Zone	1.2
LH1	Tea Zone	0.6
UM1	Coffee Tea Zone	0.8

Source: Farm Management Handbook

- Provide a minimum of 80m to 100m width tracks for livestock movement from the grazing areas to various watering points.
- Ensure siting of livestock handling facilities such as holding grounds, auction rings cattle dips, pasture conservation, isolation and quarantine areas.
- Set aside areas for common uses when subdividing group ranches e.g., trading centres, dispensaries and schools.
- Ensure that the siting, distribution and density of watering points and water pans are equitable

- Zone out wetlands during the process of subdivision of group ranches to ensure conservation and protection
- Designate areas for the location of processing facilities such as meat processing plants, slaughterhouses, and tanneries to promote value addition of livestock products

5.1.6 Disaster Risk Management and Climate Change Adaptation

Agriculture sector enterprises should put in place risk management and climate change mitigation and adaptation mechanisms as shown in Table 12

Table 12: Disaster Risk Management and Climate Change Adaptation in Agriculture

DISASTER RISK	MITIGATION /ADAPTATION
Climate-related hazards: Drought Flooding Land/Mudslides Extreme heat water level rise	• Identify, map out and prohibit farming in zones prone to climate-related disasters • Prohibit human settlements and activities in areas prone to landslides • Prohibit farming on steep slopes to avoid soil erosion, flooding and landslides • Set aside 10% of the farm for tree cover • Encourage investment in climate resilient agriculture such as climate-smart, planting of drought-resistant crops, mixed farming • Promote carbon sequestration through agriculture for example agroforestry, zero tillage
Urban sprawl	• Prepare and implement local physical and land use development plans to define urban limits • Regulate the conversion of agricultural land to other land uses • Observe minimum land sizes for the various agricultural zones
Human-wildlife conflict	• Designate wildlife corridors of a minimum width of 5km • Designate sites for water pans along the wildlife corridors • Provide a wildlife buffer along riverine areas in areas with high wildlife population
Pest and diseases pandemic	• Designate sites for isolation and quarantine facilities of livestock in case of a disease outbreak • Map out pest-prone areas for effective control of their spread
Flooding	• Identify and map flood-prone areas and prohibit human settlements in these areas • Encourage the construction of dams, water pans, trenches and terraces on the farms to facilitate on-farm stormwater harvesting and storage • Ensure rules and regulations on riparian reserves are adhered to • Encourage cover cropping to regulate surface runoff

DISASTER RISK	MITIGATION /ADAPTATION
Soil erosion	• Map out areas prone to soil erosion and encourage afforestation, reforestation and soil conservation structures • Prohibit settlements in areas prone to soil erosion, especially on steep slopes
Drought and famine	• Designate regional sites for storage facilities for agricultural products to regulate food supply • Designate sites for abstraction of water, water harvesting, water treatment and water reservoir. • Designate sites for the location of water pans to store water for livestock and irrigation purposes, especially during dry seasons • Identify and map degraded rangelands for rehabilitation

Source: Physical Planning Team; 2022

5.2 Blue Economy

Blue Economy is the sustainable use of oceans, lakes and river resources for economic growth and improved livelihoods while preserving the environment. Blue economy can be realized through marine spatial plans that integrate conservation, sustainable use, oil and mineral wealth extraction, bioprospecting, sustainable energy production and marine transport as outlined in Table 13.

Table 13: Components of Blue Economy

Category	Subcategory	Related Industries/Sector
Harvesting and trade of marine living resources:	Seafood harvesting	Primary fish production
		Secondary fisheries and related industries (e.g., processing, net and gear making, ice production and supply, boat construction and maintenance, manufacturing of fish- processing equipment, packaging, marketing and distribution)
		Trade of seafood products
		Trade of non-edible seafood products
		Aquaculture
	Usage of marine living resources for pharmaceuticals and chemicals	Marine biotechnology and bioprospecting
	Harvesting of marine flora for none food purposes	Use for construction materials eg fencing

Extraction and use of marine non-living resources	Extraction of minerals	Seabed mining and shoreline sand harvesting
	Extraction of energy sources	Oil and gas
	Freshwater generation	Desalination
Use of renewable non-exhaustible natural forces	Generation of offshore renewable energy	Renewables including: offshore wind energy tidal energy wave energy ocean thermal energy conversion
Commerce and trade-in and around the oceans	Transport and trade	Shipping and shipbuilding Maritime transport Ports and related services
	Coastal development	Coastal urbanization
	Tourism and recreation	Seaside leisure tourism dive tourism, maritime archaeology, surfing, cruises, ecotourism, recreational fishing operations Marine parks Historical and cultural sites
Ecosystem services and resilience	Blue Carbon	Carbon sinking through mangrove forests
	Coastal Protection	Restoration of the coastal belt
	Biodiversity	Protection of marine species and their habitats through Marine Protected Areas (MPAs).

Source: Physical Planning Team; 2022

Standards and Guidelines for Oceans

- Prepare an inter-county physical and land use development plan for Kenya's coastline
- Prepare marine spatial plans to guide the distribution of land uses.

- Identify and map ecologically and environmentally sensitive areas and prohibit development in these areas.
- Map out cultural and heritage sites and facilities and prohibit tourism development and activities that derail local cultures, traditions, and heritage.
- Delineate a riparian reserve of 300m oceans from the highest watermark.
- Regulate permissible developments within the 300m riparian reserve.
- Adopt a radius of 700m buffer zone around aid to navigation.
- Designate a minimum of 6m access road to the beach.
- Beach accesses should be at a maximum interval of 500m.
- Designate routes and trails on the surface or underwater to guide tourists.
- Designate space for permissible activities in the riparian reserve such as trails, games, picnic sites, swimming trails, cycling, conservation, and restoration.
- Designate areas for museums, theatres, markets, stalls, aquariums, public parking, bicycle stands, cycling paths, restaurants, and parks after the riparian reserve.
- Designate sites for renewable technology developments such as solar-powered desalination plants.
- Heavy industrial developments should be 3km from the beach.
- Provide wayleaves for undersea cables and bridges.
- Sand excavation in the active zone, which is within a distance of 1km from the low tide, is not allowed. Regulate developments to ensure the required visibility to aid navigation is maintained.
- Prohibit fishing on artesian waters 1km into the sea from the low water mark, to avoid destruction of shallow fauna breeding grounds and marine biodiversity.
- Regulate the heights of all developments crossing a navigable water body e.g., bridges, power lines.
- Encourage the use of an ecosystem-based approach to the management of fishing to ensure sustainable and resilient fish stocks and avoid damage to fragile habitats.
- Ensure that developments do not block public access to the beach.
- Conserve resources such as sand dunes, mangrove forests, salt marshes and estuaries in all development proposals.
- Prohibit any vehicular access to the beach.
- All developments in the front row from the sea shall be subjected to environmental impact assessment before approval.

- Prohibit shore protection facilities that block tidal movement e.g., sea walls unless by allowed specification of the relevant authority.
- Prohibit all effluent into the sea

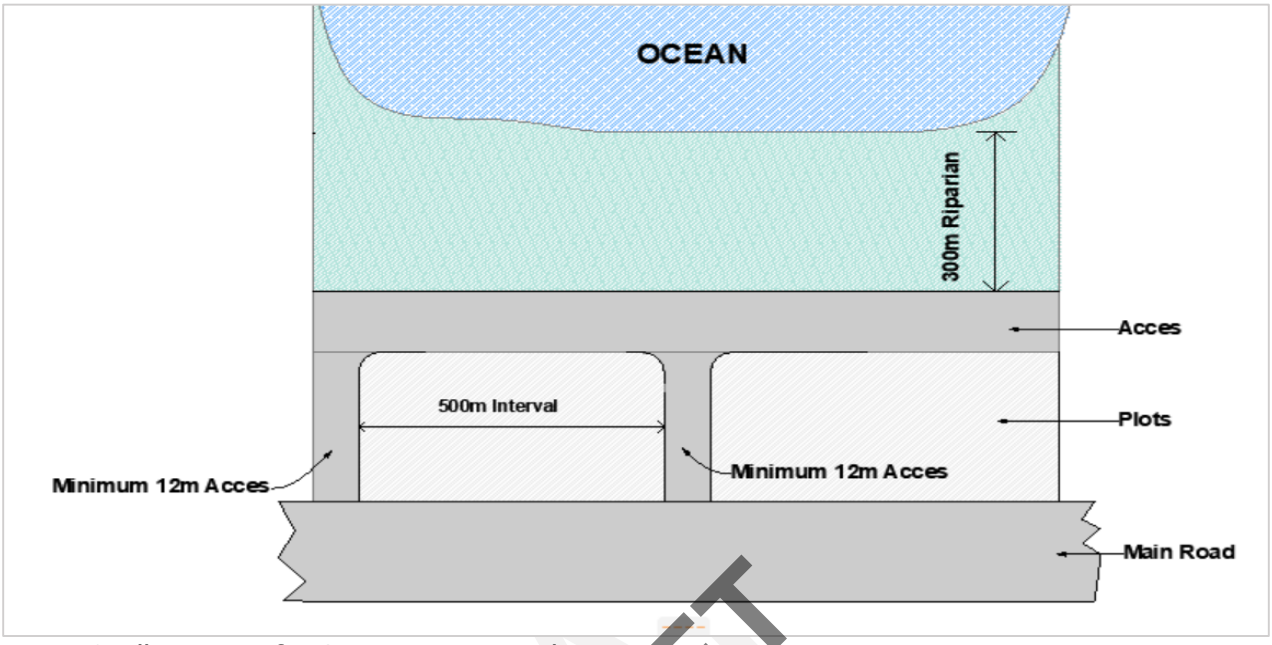

Figure 8: Illustration for Ocean Front Development
Source: Physical Planning Team; 2022

5.2.1 Disaster Risk Management and Climate Change Adaptation

Table 14: Disaster Risk Management and Climate Change Adaptation for Blue Economy

DISASTER RISK	MITIGATION
Climate-related hazards: Heatwaves sea level rise coastal erosion flooding cyclones	• Identify and map areas prone to climate-related disasters • Prepare a climate action plan for areas identified as being at high risk of climate disasters • Demarcate and observe a riparian reserve of 300m from the highest water mark from which developments are to be done • Encourage afforestation and reforestation of mangrove forests and coastal strand vegetation (papyrus, reeds) • Encourage Investment in blue carbon credit programs by relevant departments to promote environmental conservation • Encourage the practice of geo-engineering methods of carbon sequestration within the marine ecosystem
Tsunami	• Identify and map areas prone to Tsunami • Designate evacuation routes and shelters

DISASTER RISK	MITIGATION
Marine pollution	• Identify and map extremely sensitive marine environments such as corals • Designate sites for scraping and disposal of marine vessels • Designate sites for location of waste bins on the beach, sewerage treatment plant, landfills, storm water drainage • Encourage the practice of 4Rs in waste management
Oil Spillage	• Map shipping routes away from ecologically sensitive areas. • Encourage adoption of international instruments for managing transboundary waste
Depletion of marine vegetation	• Designate marine reserve areas • Encourage mangrove restoration programs through Community-led partnerships
Extinction of marine living organisms	• Develop a marine spatial plan to promote spatial and temporal distribution of activities in the marine space • Designate sites for marine scientific research institutions

Source: Physical Planning Team; 2022

5.3 Natural Resources and Environment

General Standards and Guidelines

- Identify and plan for areas containing natural resources for purposes of regulating human activities
- Prepare action area plans for rehabilitation of areas of depleted resources
- Require an Environmental Impact Assessment for developments within and around natural resource areas
- Incorporate best management practices to prevent pollution of natural resources and the environment

5.3.1 Rivers

Standards and Guidelines

- Maintain a minimum riparian reserve of 10m or a reserve that is equal to the average full width of the river measured from the highest watermark, whichever is higher, but which shall not exceed 30m, on either side of the river. For the flood plains, it may be higher depending on the occurrence on the ground as illustrated in Figure 9.

- Prohibit physical developments within the riparian reserve unless they are necessary for flood protection, preservation of water quality, protection of aesthetic and biological resources, hydro-electric power generation, water intake, eco-tourism, research and landing sites for marine vessels.
- Prohibit planting of vegetation that require huge amounts of water for its growth such as eucalyptus trees within the riparian reserve, instead, preference should be given to alternative water-conserving species such as bamboo trees.
- Prepare riverfront action plans
- Designate sites for watering troughs and pans at strategic locations to discourage direct access to the rivers by livestock.

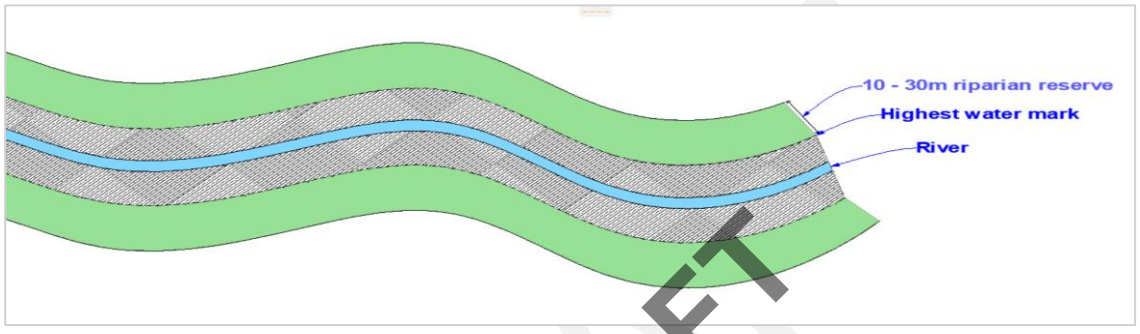

Figure 9: An Illustration of a Riparian Reserve
Source: Physical Planning Team; 2022

5.3.2 Lakes

Standards and Guidelines

- A riparian reserve of not less than 100m and not more than 200m as measured from the highest watermark shall be maintained for all lakes.
- Notwithstanding the above, the riparian reserve for Lake Naivasha shall be maintained at a 6210ft contour.
- Provide a 12m road buffer around the lakes.
- Prepare lakefront action plans.
- Prohibit planting of vegetation that requires huge amounts of water for its growth such as eucalyptus trees within the riparian reserve, instead, preference should be given to alternative water-conserving species such as bamboo trees.
- Heavy industrial developments and polluting agricultural activities should be 3km from the beach
- Sand excavation in the active zone which is within a distance of 1km from the low tide is not allowed

- Regulate developments to ensure the required visibility to the aid-to-navigation is maintained
- Prohibit all effluent into the lake

5.3.3 Swamps
Standards and Guidelines

- Prepare local physical and land use development plans and integrate management of water catchment area developments around swamps.
- Identify and map swampy areas.
- Maintain a riparian reserve of at least 50m and not more than 70m for swamps measuring more than 1 acre measured from the highest watermark
- Maintain a riparian reserve of at least 20m and not more than 30m for swamps measuring less than 1 acre as measured from the highest watermark
- Ensure sustainable use of swamp resources such as harvesting of papyrus reeds, grass, and fish among others.

5.3.4 Springs
Standards and Guidelines

- Identify and map springs.
- A riparian reserve of at least 6m as measured from the source of the spring shall be maintained.
- Prohibit any development within the riparian reserve and maintain the natural vegetation around the spring
- Prepare action plans for maintenance and rehabilitation of springs and drainage ways.

5.3.5 Ground Water
Standards and Guidelines

- Identify and map areas with hydro-geological groundwater.
- Provide a buffer of 10m wide around the boreholes and wells to protect them from contamination.
- Maintain a radius of influence of 800m between one borehole and another to ensure that abstraction rates do not exceed recharge rates.

- Provide for a recharge basin in an area of 4.5ha.
- Provide a buffer of 60m around the recharge basins.
- Designate and plan for a Managed Aquifer Recharge System.
- Prohibit activities that are likely to pollute ground waters such as tanneries and heavy industries from areas around the boreholes
- Require an environmental impact assessment prior to development of boreholes

5.3.6 Forests

Standards and Guidelines

- Identify, map and delineate forests for conservation
- Provide a minimum of 60m wide buffer along mangrove forests.
- Provide a minimum of a 12m buffer zone between forests and other land uses to curb encroachment.
- Prohibit development in forest areas except for eco-tourism, research, and infrastructural developments such as transport, power and water.
- Encourage inter-agency coordination, public-private and community partnerships in the planning and management of forests.

5.3.7 Hilly/Slope Areas

Standards and Guidelines

- Zone water catchment areas in hilltops and hillsides for conservation.
- Allow infrastructural developments such as controlled settlements at the foothill of steep slopes paying attention to the nature of the slope.
- Provide for a planted buffer between the foothill and the settlement to mitigate disasters such as falling boulders.
- Encourage the planting of trees on the hilly areas.

Table 15 indicates the type of development and the development conditions in hilly areas.

Table 15: Development conditions within slope areas

Slope Percentage (%)	Type of development	Development Condition(s)
0-12	All	
12- 44	Contour farming Controlled development	Implementation of slope-control measures such as contour farming and soil conservation measures are encouraged for cultivation
44-55	No development except pipelines, tunnels, telecommunication infrastructure and roads	Extensive terracing perennial/permanent crops
Above 55	No development except pipelines, tunnels, telecommunication infrastructure and roads	Forests Eco-tourism related activities such as mountain climbing and nature trails

Source: Physical Planning Team; 2022

5.3.8 Mines and Quarries Standards and Guidelines

- Identify and map quarry sites.
- Prepare plans for mines and quarries which shall include emergency services, waste disposal and proposals for site rehabilitation
- Require Environmental and Social Impact Assessment before quarrying and mining.
- Secure all quarry faces/cliffs by fencing. The fence should be at least 10m from the edge of the cliff using a chain link of at least 1.5m high. Require change-of-user permits before the establishment of a new quarry site
- Encourage the use of sustainable technology in mining and quarrying

Table 16 shows safety distances to be maintained in quarry operations where blasting is not involved. Where blasting is involved, the concerned relevant authorities shall determine safe distances.

Table 16: Siting of quarries in relation to other land uses

Land use	Safe distances
Aerodromes/landing ground (15km radius)	To be determined by Kenya Civil Authority and Kenya Airport Authority

Shopping centre, school and hospital	100m
Individual house	100m
Road/rail/pipeline reserve	40m
River/wetland/water catchment riparian areas	40m

Source: Physical Planning Team; 2022

5.3.9 Water Towers
Standards and Guidelines

- Identify and prepare an integrated plan for water towers.
- Provide a minimum of 60m buffer around the water towers.
- Promote the growing of indigenous trees within and around the water towers.
- Prohibit developments in these areas except for eco-tourism, research and essential infrastructure.

5.3.10 Oil and Gas
Standards and Guidelines

- Identify and map out areas with high potential for oil and gas exploitation.
- Prepare an integrated plan for oil and gas areas. The plan should also include planning for emergency and rehabilitation, waste disposal and an action plan for resettlement areas
- Provide a minimum buffer of 2km around the oil and gas exploration areas, which shall be free from settlements. However, tree planting is encouraged to improve air quality.
- Maintain a setback of 500m from the boundary of the exploration block when drilling an oil and gas well.
- Require preparation of Emergency Preparedness and Response Plans.
- Undertake Environmental and Social Impact Assessment for exploration and exploitation to mitigate against incidences of pollution and environmental degradation.
- Prepare site layout plans for the oil and gas exploration sites, which should include parking lots for petroleum trucks, gas handling and storage facilities.
- Seek development permission for all exploration and exploitation from the relevant national and international bodies.

- Ensure that exploration of oil and gas does not infringe on cultural heritage areas, conservation areas, game parks and reserves.
- The exploration/exploitation should be done away from the approved shipping lanes/routes.
- The exploitation sites are to be mapped/marked, constructed, buoyed and fitted with navigational aids to ensure safety of navigation.
- Encourage the use of sustainable technology in oil and gas exploration and exploitation.

5.3.11 Transboundary Resources
Standards and Guidelines

- Identify and map transboundary resources.
- Provide a buffer zone for the respective resources as provided in this handbook.
- Prepare integrated plans for sustainable use of transboundary resources to include their catchment areas.

5.3.12 Wildlife
Standards and Guidelines

5.3.13 Disaster Risk Management and Climate Change Adaptation
Table 17 outlines the disaster risk for the natural resources and environment sector and the proposed mitigation measures.

Table 17: Disaster Risk Management and Climate Change Adaptation

DISASTER RISK	MITIGATION
Climate related hazards: Drought Water level rise coastal erosion flooding desertification	• Identify and map ecosystems prone to climate-related disasters • Incorporate climate adaptation and mitigation strategies during the preparation of physical and land use development plans • Encourage investment in climate adaptation and mitigation programmes • Promote carbon sequestration programmes such as Reducing Emissions from Deforestation and forest Degradation (REDD+)
Loss of Biodiversity	• Identify and map areas at high risk of biodiversity loss • Prepare local physical development plans for biodiversity management

DISASTER RISK	MITIGATION
	● Designate sites for biodiversity research, reserves/ demonstration farms
Flooding	● Identify and map flood-prone areas ● Prohibit human settlements in areas prone to flooding and watersheds ● Develop appropriate flood management plans ● Designate sites for water collector tunnels, water recharge basins, dams, water pans and construction of flood protection structures such as dykes, canals
Environmental degradation	● Identify and map environmentally degraded areas ● Conduct an Environmental Social Impact Assessment ● Promote environmental rehabilitation and restoration programs
Soil Erosion	● Identify and map areas prone to soil erosion ● Encourage soil conservation measures such as afforestation, re-afforestation, agroforestry and construction of gabions
Earth movements e.g. landslides, earth flows, rock falls	● Identify and map areas prone to earth movement and prepare appropriate management plans ● Encourage the planting of trees and vegetation on steep slopes ● Prohibit development in areas with slopes that exceed 44%
Resource conflicts	● Prepare land use plan for sustainable use of resources ● Integrate participatory planning approaches in the preparation of plans and management of resources ● Plan for livelihood diversification ● Provide buffer zones between different uses ● Sensitize on sustainable use of resources. ● Identify, map and protect wildlife corridors and dispersal areas
Fire outbreaks	● Identify and map fire-prone areas ● Develop appropriate fire management plans ● provide for fire breaks ● Designate sites for fire stations, hydrants, fire engine routes, evacuation sites and routes and other appropriate fire management-related facilities in the settlement areas

DISASTER RISK	MITIGATION
Deforestation	● Identify and delineate forest boundaries ● Prohibit developments in forest areas except for eco-tourism, research and educational purposes ● Provide buffer zones around forests ● Encourage agroforestry, conservation and sustainable use of forest resources

Source: Physical Planning Team; 2022

5.4 Roads

Roads in Kenya are classified into National Trunk Roads and County Roads. These roads are classified further as follows:

5.4.1 National Trunk Road Networks

These are divided into primary national trunk roads and secondary national trunk roads.

Primary National Trunk Roads

i. Class S Highways

These are roads connecting two or more cities meant to safely carry a large volume of traffic at the highest legal speed of operation. They are provided with a road reserve of **90-120m.**

ii. International Trunk Roads (Class A)

These are roads that form strategic routes and corridors, connecting international boundaries at identified immigration entry and exit points and international terminals such as international air or seaports. They are provided with a road reserve of **60 -110 m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

A minimum road of **40 m** should be adopted only when necessary for economic, financial or environmental resources, to preserve valuable land resources or existing development or when provision of the desirable width would incur unreasonably high costs because of physical constraints. For dual carriage roads, it may be necessary to increase the road reserve width above the recommended values.

iii. National Trunk Roads (Class B)

These are roads that form important national routes, linking national trading or economic hubs, county headquarters and other nationally important centres to each other and to the national capital or to Class A roads. They are provided with a road reserve of **60m - 90m**.

A minimum road of **40 m** should be adopted only when necessary for economic, financial or environmental resources, to preserve valuable land resources or existing development or when provision of the desirable width would incur unreasonably high costs because of physical constraints. For dual carriage roads, it may be necessary to increase the road reserve width above the recommended values.

iv. Urban Major Arterials (Class H)

Urban major arterial highways are meant to carry through traffic and relatively long-distance traffic between widely separated parts of the city or municipality. They are required to provide mobility within an urban area as opposed to access. They are provided with a road reserve width of **60–90m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

v. Minor arterials (Class J)

These roads carry traffic between different zones of the urban area and include the principal urban bus routes. They include roads within economic zones that are planned by the National Government and roads within State Houses and Lodges including their access roads. They are required to provide mobility as opposed to access. They are provided with a road reserve width of **40-60m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

vi. Urban major collector roads (Class K)

These roads collect traffic from the local roads and channel it to the major and minor arterial roads. The roads are meant to provide for both mobility and access. They are provided with a road reserve width of **25-40 m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

Secondary National Trunk Roads

i. Primary Roads (Class C)

These roads form important regional routes, linking county headquarters or other regionally important centres and to Class A or B roads. They are meant to collect regional and local traffic and channel it to class A and B roads. They are provided with a road reserve of 4**0-60m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

ii. Secondary Roads (Class D)

These roads link constituency headquarters, municipal or town council centres and other towns. They are required to collect local traffic from lower-class roads and channel it to the higher-class roads. They are provided with a road reserve width of **25 - 30 m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

Figure 10: Illustration of a road reserve
Source: Physical Planning team; 2022

5.4.2 County Road Networks

i. Major Feeder Roads (Class E)

These roads link important constituency centres and are meant to carry local traffic and to channel it to class D roads. They are provided with a road reserve width of **20-25m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

ii. Minor Feeder Roads (Class F)

These roads link market centres and channel traffic to class E roads. They are provided with a road reserve width of **15-25m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

iii. Urban minor collector roads (Class L)

These roads perform a similar function as the class K roads i.e., to collect traffic from the local roads and channel it to the arterial roads, but in a smaller catchment area meant to collect traffic from the local roads and channel it to class K roads. They are provided with a road reserve width of **15-30m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

iv. Local urban access roads (Class M)

These roads are meant to provide access to commercial properties and residential areas and also cater to a high level of pedestrian traffic. They are provided with a road reserve width of **12-15m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

v. Class N

These roads provide direct access to individual or groups of properties, and residential areas, or to places of specific social or economic activity, including industrial and commercial areas and government institutions such as schools, hospitals, prisons and government housing. They are provided with a road reserve of **12-15m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves.

vi. Class P

These roads provide direct access to groups of residential properties. This is the lowest class of public roads and therefore Class P roads will provide all other public access (e.g., access to social amenities such as schools, hospitals, etc.) not provided by higher-class roads. They are provided with a road reserve of **9-15m** to accommodate future road connections or changes in alignment, road carriage width, junction layouts, NMT paths, walkways and utility wayleaves. Figure 11 illustrates the hierarchy of roads

NOTE: *9m roads will only be provided for cul-de-sacs serving residential areas and shall not be more than 90m.*

Figure 11: Hierarchy of Roads

Source: Physical Planning Team; 2022

Carriageway Standards

Carriageway standards shall be in accordance with road design manuals.

Siting of Roads

The following factors shall be considered while sitting roads:

1. The topography
2. Hydrological characteristics
3. Environmental and geotechnical considerations
4. Economic viability
5. Social characteristics including cultural heritage, archaeological sites, etc
6. Prevailing Land uses on or around the Planning area
7. Conformity to the existing road alignments

General Standards and Guidelines

- Consider safety, functionality and environmental sustainability during planning and designing for roads.

- Designate service lanes, pedestrian walkways, space for signages, street lighting and cycling paths.
- There should be no direct access to properties from Class S, Class A, Class B and Class H roads.
- Provide slip roads on Class S, Class A, Class B and Class H roads to human settlements.
- Provide standard wayleaves for electricity supply, stormwater, fibre optic cables and sewer.
- Restrict direct access to individual plots from arterial roads.
- Increase road reserve widths of classified roads passing in urban centres to allow for parking, segregation of traffic, street furniture or for controlled accessibility to properties, where necessary.
- Provide waste recycling bins within given intervals on pedestrian walkways.
- Encourage water-harvesting facilities from stormwater drains.
- Control encroachment of human activities along the bypasses and major roads
- Encourage landscaping and tree planting to enhance aesthetics
- Provide road truncations with clear markings and the minimum size should be half the width of the road as illustrated in Figure 12.
- Permitted developments include:
    i. Public utilities such as water and sewer wayleaves, electricity wayleaves and fibre optic cables.
    ii. Bus stops and roadside drop off and pick up points.
    iii. Street furniture, road marking, street landscaping, water points, street toilets, street lighting, waste recycle bins among others.
    iv. Non-Motorised Transport.
    v. Advertisements and signage.
    vi. Parking facilities.
    vii. Street vending facilities

For design guidelines, refer to the road design manuals and the Street Design Manual for Urban Roads (SDMUK) in Kenya

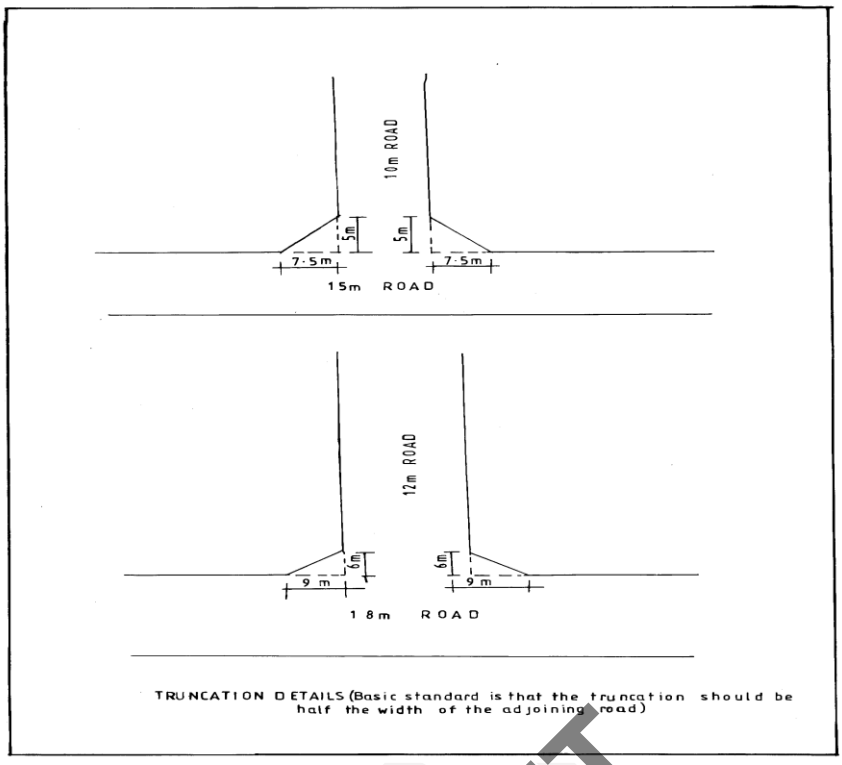

Figure 12: Illustration of truncations
Source: Physical Planning Team; 2022

5.4.3 Bus Rapid Transit

Standards and Guidelines

- Any road that serves a BRT corridor should have a minimum reserve of 65m.
- Designate areas for pedestrian drop-off and pick-up points
- For design standards refer to the Street Design Manual for Urban Roads (SDMUK) in Kenya

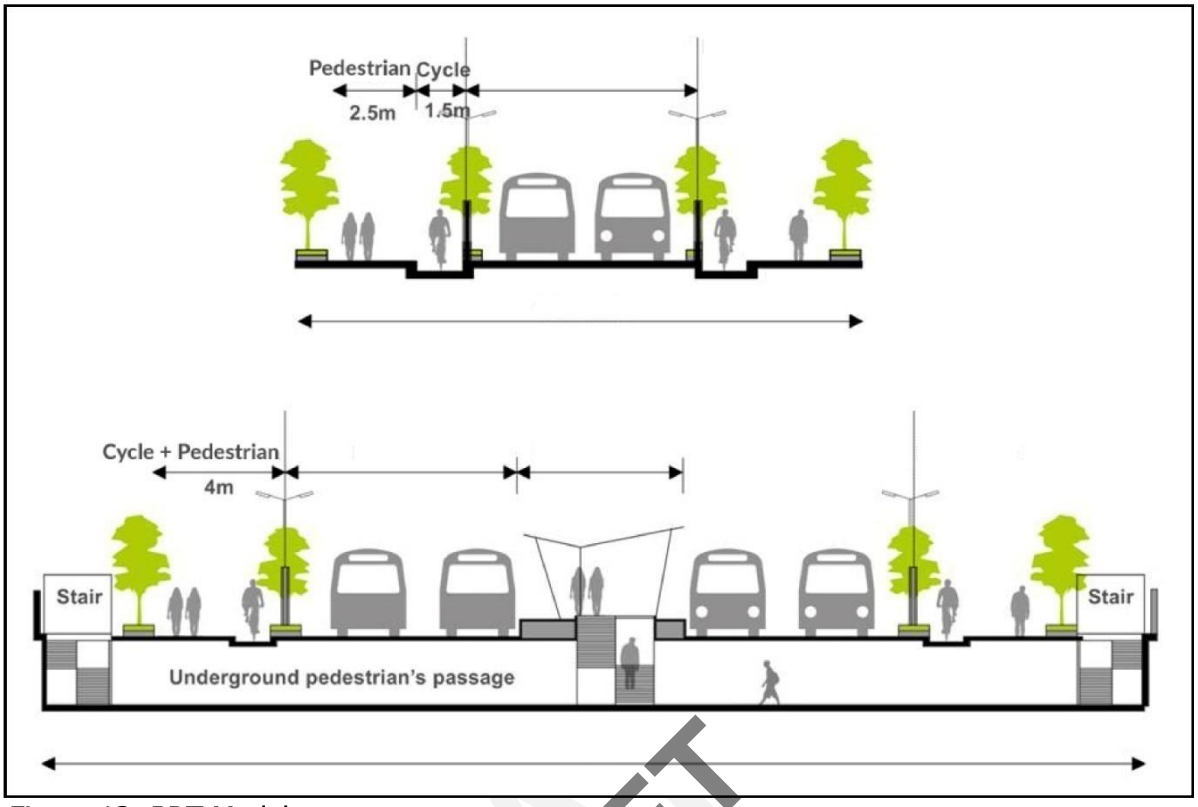

Figure 13: BRT Model

Source: Physical Planning team; 2022

5.4.4 Transport Interchanges

A transport interchange is a facility allowing commuters and cargo to transfer between different modes of public transport or between two services of the same mode. It is a place where commuters can join or leave the public transport system on foot, bicycle, motorcycle or car.

Standards and Guidelines

- Designate sites for transport interchanges while considering factors such as mobility needs, transport integration, zoning regulations, proximity to urban centers, availability of basic services, development character of the area, and integration of modern technology among others
- Locate interchanges within major destinations in town or district centres or shopping centres.
- Locate commercial areas adjacent to public transport interchanges and residential areas away from the interchanges.
- Require an environmental impact assessment

Figures 14 & 15 illustrate examples of interchanges

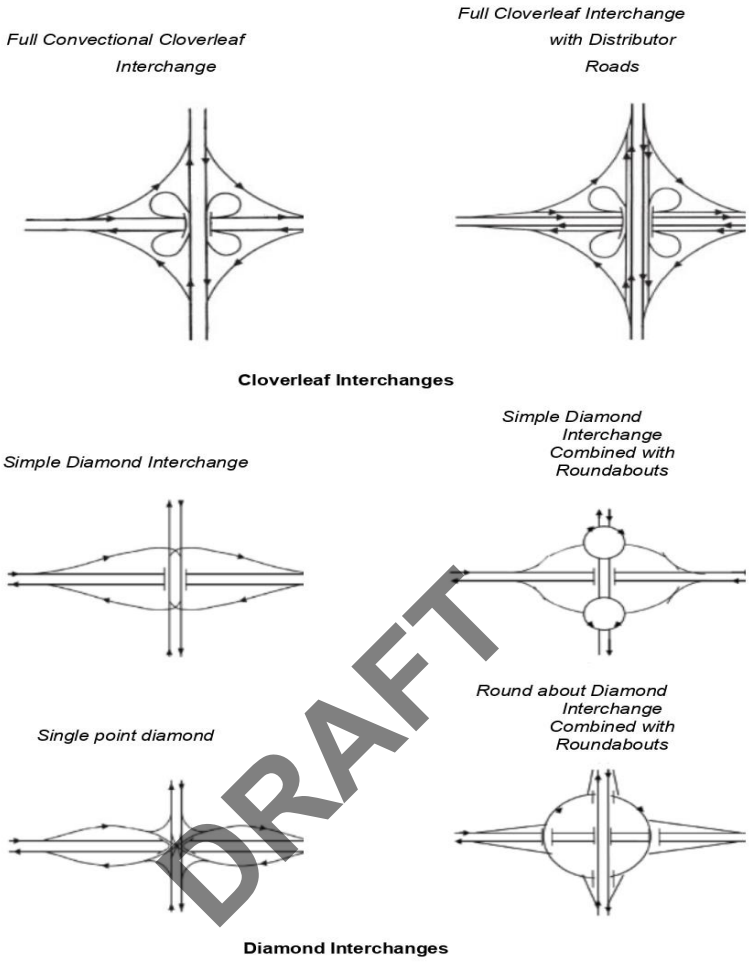

Figure 14: Transport interchange
Source: Physical Planning Team; 2022

Figure 15: Illustration of a section of an interchange crossing
Source: Physical Planning Team; 2022

5.4.5 Bus Termini

Standards and Guidelines

- Bus termini should be located outside the CBD with intermodal linkage with the CBD. This is to minimize traffic congestion and pollution
- Provide bus terminus furniture including benches, signage, shelters, waste bins, lighting
- Provide spaces for car parking, bicycle parking, restaurant, health clinic, police booth, sanitation services, and administrative block among others.
- Bus termini should be accessible to all special-needs groups.
- Ensure separation of traffic to minimize accidents

5.4.6 Parking

Parking is a space designated for leaving vehicles, bicycles, and motorcycles temporarily. The county governments should ensure the introduction of multi-storey parking lots and encourage their location outside the CBD. These parking lots should be integrated with

the interchanges. Parking in Kenya takes the form of vehicular parking and bicycle parking as outlined below.

Vehicular Parking

There are various types of vehicular parking such as angle, flash, and parallel parking among others.

Angle Parking: In angle parking, vehicles are parked at a given angle. The parking area is designed with an entrance and exit from both sides.

Flush parking: This kind of parking is found on the left side of a road in the direction of traffic flow.

Standards and Guidelines

- Designate spaces for parking, considering factors such as drainage, access, and safety of people living with disabilities among others
- Provide adequate, safe and convenient parking facilities.
- Parking facilities should be provided to manage vehicular traffic and eliminate obstruction to vehicular traffic flow.
- Orient the parking lot layout in relation to the building entrance to ensure that pedestrians walk parallel to vehicular movement rather than crossing parking rows and drive aisles.
- Locate parking close to building entrances, ensure that it is easily identifiable and separate from pedestrian circulation areas.
- Provide on-site directional signs to direct motorized vehicles to appropriate parking.
- Parking areas should be paved with asphalt or concrete.
- Integrate traffic calming techniques into the transportation and site layout to slow and divert traffic thus enhancing safety. These include wide-speed humps, raised crosswalks, and raised intersections.
- Avoid narrow speed humps as they may cause loss of control of the vehicles at higher speeds lighting.
- Provide lighting fixtures for night time illumination
- Encourage solar street and smart energy-efficient lighting.
- Encourage covered areas that provide shade and protection from extreme weather conditions. Provide on-plot parking in the central commercial and business zones.
- Provide adequate public car parks in the residential areas.
- Discourage on-street parking to minimize traffic congestion and accidents.

- On-street parking is not permitted along the carriageway ways on national highways.

Parking Requirements for Persons Living with Disabilities (PLWD)

- Parking lots shall have a minimum width of 3m.
- All PLWD-accessible parking spaces shall be clearly designated with signs situated approximately 2m high
- All parking lots reserved for the PLWD drivers should be clearly marked and designated with appropriate signage.
- The lots should be located as close as possible to ramps, walkways, entrances, and elevators.
- A minimum of one parking space or one percent of the parking spaces, whichever is more, should be reserved for persons living with disabilities.

Table 18: Space Requirements for Vehicles

	Flush/Parallel Parking	**Angle Parking**
Cars	5.0-6.5m by 2.5m	5.0-6.5m by 2.5m
Buses	10.0m by 3.3m	10.0m by 3.3m
Trailers and Trucks	30.0m by 4.0m	40.0m by 2.5m at an angle of 30 degrees

Source: Physical planning team; 2022

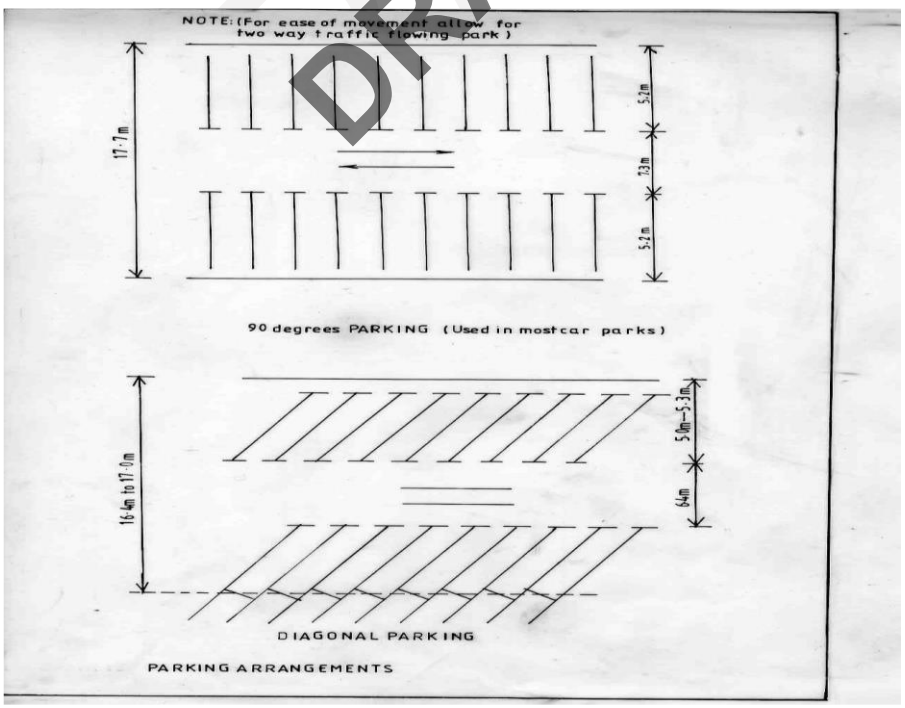

Figure 16: Types of parking
Source: Physical planning team; 2022

Table 19: Car Parking Requirements Based on Usage

Usage	**Proposed New Minimums**	**Building Code Provisions: Per every 100m² gross built areas**
Housing	Minimum ratio of parking rations per dwelling unit; a) Low density- 1: 2 b) Medium density – 1:2 c) High density –1:3 d) Single-family dwelling= 1: 2 e) Multiple residential = - One bed unit= 1: 1.5 - 2 or more-bedroom unit = 1: 2.5 NB: 25% of the total required parking is provided for guest parking outside on individual parking spaces.	
Specialized market place	1 parking space for every 2 stalls	1:1
Market	a) Catchment population of approximately 30,000 persons = 10% of permitted total area b) Roadside stalls = 4 spaces	1:1
Neighborhood Shopping Centers	Catchment population of up to 15,000 persons = 20% of permitted total areas	-
Office and Administration	-	1: 2.5
Hotel	1: 1	1: 2
School		1:1 equivalent to 1%
Mosque/churches	1: 10 worshippers or 1:5 fixed seats	1: 2.5
Hospital		1:2
Sports field & outdoor and indoor recreational facilities	1: 3 persons anticipated at maximum capacity	1:2
Industrial establishment and workshops	1: 1000 square feet plus one additional space for every 3 employees	1:1
Nursing Home	1: 3 per bed or 1:3 per dwelling unit, whichever is less.	1:1

Source: Physical planning team; 2022

Bicycle Parking

Standards and Guidelines

- Designate parking space of 2m long and 0.45m wide.
- A minimum of 5% percent of allocated parking spaces should be reserved for bicycle parking.

Table 18: Bicycle Parking Standards

Land Use	Parking Space
Residential	5% of the total parking area.
Industrial	5% of the total parking area
Educational	5% of the total parking area
Recreational	2% of the total parking area
Public purpose	5% of the total parking area
Commercial	5% of the total parking area
Public Utilities	1 % of the total parking area
Transportation	10% of the total parking area

Source: Physical planning team; 2022

5.4.7 Non-Motorised Transport (NMT)

Cycling Lanes
Standards and Guidelines

- Provide a minimum of 3m for a combined cycle lane and walkways.
- Provide a minimum of 2m for a separate cycle lane
- For design standards refer to the Street Design Manual for Urban Roads (SDMUK) in Kenya.

Walkways

Standards and Guidelines

- Designate a minimum width of 2m for dedicated walkways.
- Encourage landscaping, planting of ornamental trees and provision of benches along the walkways

- Refer to the Street Design Manual for Urban Roads (SDMUK) in Kenya. Figure 17 below illustrates a section of non-motorized transport

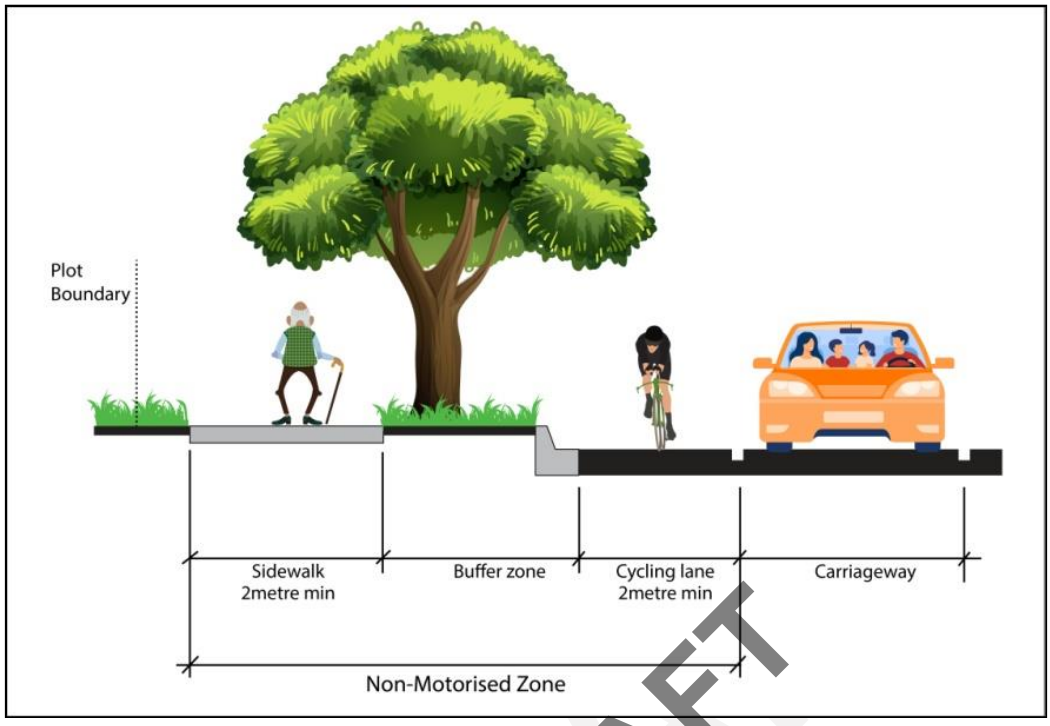

Figure 17: Section of non-motorized transport
Source: Physical planning team; 2022

5.4.8 Roadside Stations

Standards and Guidelines

- The minimum land requirement is 3ha.
- The minimum recommended distance between roadside stations **is 100km.**
- Integrate with the electric vehicle charging stations.
- Roadside stations along the highways should be alternated on both sides of the road to provide adequate resting options for travelers in both directions.
- The minimum facilities required in a roadside station include parking space, garages, petrol station, recreational area, administrative offices and security offices, drainage, signages, street lighting, restrooms/hotels, washrooms, restaurants, shops/supermarkets, health clinics and emergency response center and bank/bureau office. The size of these individual facilities shall be provided in line with the standards laid out in this handbook.

5.4.9 Petrol Stations

- The minimum land size for petrol stations is 0.2ha.
- Provide a minimum of 10m setbacks from the highways
- Provide 80-100m acceleration and deceleration lanes
- Ensure a minimum distance of 200m between two petrol stations is maintained
- Require Environmental Impact Assessment before development permission is granted.
- Provide fire-fighting protection, waste management and vapour vents

5.4.10 Electric Vehicle Charging Stations

Standards and Guidelines

- The minimum land size for an electric vehicle charging station is 0.25ha.
- Provide a minimum of 5% of parking space for electric vehicle charging.
- Mark and equip charging stations with infrastructure installed in accordance with International Electrotechnical Commission (IEC) standards.
- Integrate charging stations within roadside stations, petrol stations and commercial buildings.

5.4.11 Corridor Development

Standards and Guidelines

- Provide a buffer zone of 50km on both sides along the corridor to prevent urban sprawl
- Prepare a comprehensive strategy to guide developments within the corridor.
- Establish strategic towns within the corridor and encourage compact development Establish special economic zones and industrial parks.
- Conserve the patterns of livelihoods and settlements.
- Preserve local cultural and historic sites and resources. Provide for parking and roadside stations along the corridor.

5.5 Railway transport

5.5.1 Railway Reserve

A railway reserve is land vested in the Kenya Railway Corporation (KRC) by any written law and land conveyed or otherwise placed at the KRC disposal reserved for its use.

Standards and Guidelines

- Provide a minimum reserve of 60.96m for a meter gauge railway (MGR)
- Provide a minimum reserve of 30.48m (100ft) on either side of the center track of the main line of a meter gauge.
- Private sidings shall be at least 7.5m wide. Sidings in rail-served and government-owned industrial areas shall be 30.48m on either side from the center of the track
- Provide a minimum reserve of 70m for SGR and at least 130m in protected areas.
- Provide a minimum of 91.44 m (300ft) on either side of the center of the main lines in standard station areas. Specific measurements for marshalling yards, terminal stations and changing stations shall be as defined in the station layouts.
- Enforce building lines and setbacks of a minimum of 12m from the boundary in properties abutting the railway corridor.
- Regulate human activities such as livestock keeping and cultivation of crops on railway reserves. Cultivation may not be done unless prior approval has been given, guided by cultivation agreements. There should be no cultivation on slopes steeper than 35% and should not be within 30ft from the center of the track.
- Explosive or radioactive materials shall not be permissible around the railway network unless previous approval has been obtained and care is taken to see that the line is clear of dislodged stones or other obstructions before removing danger signals.
- In case of realignment of track, the land shall not be allocated for any other use before due process is followed. The land shall be gazetted and a deed of surrender is issued in line with NLC Act.
- Railway construction projects shall be based on topographical and geo-technical surveys and EIA /SEA reports.
- Provide underpass and overpass pedestrian and bicycle crossings across railway corridors, motorways and other natural barriers, to connect neighborhoods and key destinations.
- Railway transport shall integrate interchange facilities such as bus stations, parking, airports and ferry slips.
- Provide a street between the railway operating corridor and the surrounding area, to provide an active frontage in metropolitan areas.

- Designate a noise buffer for adjacent buildings and the surrounding area
- All development applications abutting railway reserves and operational areas shall not be approved until it's subjected to the prescribed KRC and PLUPA processes. Access to buildings shall not be provided on the side facing the railway reserve.
- No alteration of existing roads passing through railway reserves shall be permissible except with the express authority from KRC.
- Buildings, roads, pipelines, water pipelines, sewage lines, power distribution infrastructure, and telecommunication masts shall be required to seek the approval of Kenya Railways before crossing, abutting or running along any railway reserve.

5.5.2 Level Crossing Reserve (Diamond)

- The selection site for a level crossing is dependent on the safety of the road and rail traffic and clear sight visibility. Land adjoining the railway track should not be above the rail level and land adjoining the road should not be more than 0.9m (3ft) above the road.

5.5.3 Standard Gauge Railway (SGR)

- Provide crossing access after every 2km for foot traffic and 5 km for vehicular traffic.
- Provide overpasses in cuttings and where SGR crosses the meter gauge
- Provide animal corridors in collaboration with relevant authorities (KWS, KFS, and County Governments).

5.5.4 Railway Stations Standards and Guidelines

- Prepare site layout plans for railway stations
- Provide facilities for persons living with disabilities.
- Provide adequate space to accommodate facilities such as station furniture, waste recycle bins, sanitary facilities, security, health facilities and lighting.
- Locate railway stations within the proximity to other transport terminus to ensure short and seamless transfers
- Locate commuter car parking areas away from main pedestrian entrances to the railway station.

- Provide warning signs and speed restriction boards.
- Refer to the Railway Engineering Manual, Vol I, 1962 during planning and development approval processes.

5.6 Airports

Standards and Guidelines

Site selection considerations

- Topography of the aerodrome site and its surroundings.
- Weather particularly wind distribution and the occurrence of localized fogs. The primary runway should be oriented in the direction of the prevailing wind.
- Type and amount of air traffic to be served, including air traffic control aspects. The number of runways must be sufficient to meet air traffic demands, which consist of the number of aircraft arrivals and departures, and the mixture of aircraft types, to be accommodated during the busiest periods
- Aeroplane performance considerations.
- Environmental considerations, particularly noise
- Natural obstruction. All runways should be oriented so that approach and departure areas are free of obstacles and, preferably, so that aircraft are not directed over populated areas.
- Adjacent land use. The orientation and layout should be selected to protect as far as possible the particularly sensitive areas such as residential, school and hospital zones from the discomfort caused by aircraft noise.
- Future expansion capability

General guidelines and standards

Prohibit the development of any obstacles within a 15 km radius of the runway strip to protect the Obstacle Limitation Surface (OLS). OLS is the airspace around aerodromes that is to be maintained free from obstacles to permit the intended Air System operations at the aerodromes to be conducted safely as shown in Figure 18 illustrates OLS.

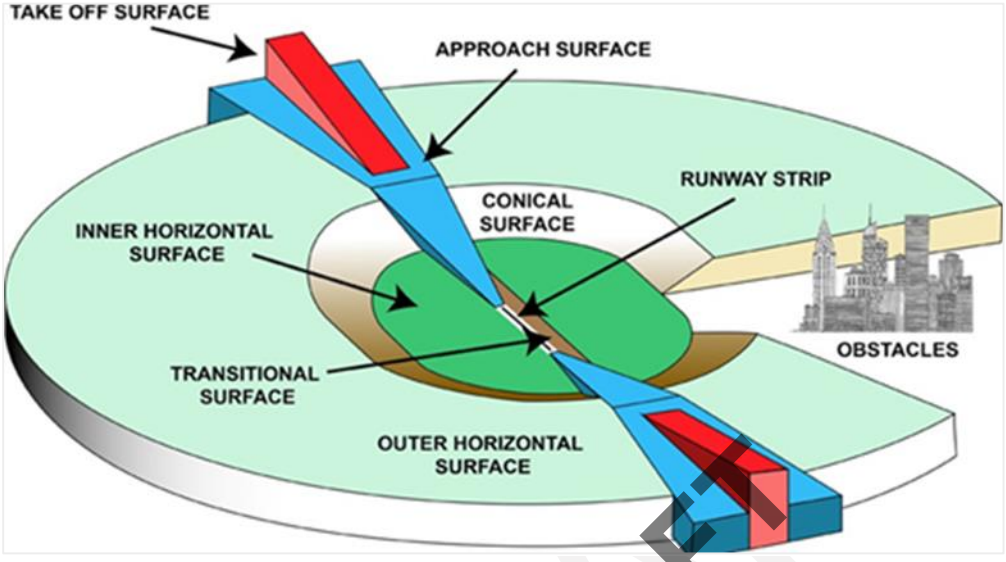

Figure 18: Obstacle Limitation Surface (OLS)
Source: ICAO, Annex 14

Restricted developments in the OLS include:

- Quarries
- Slaughterhouses
- Hospitals
- Schools
- Greenhouses
- Agricultural activities
- Dumpsites

Table 20 should guide buildings above the heights and slopes on the OLS

Table 20: Dimensions and slopes of obstacle limitation surfaces — Approach Runways

	Runway Classification									
Surface and dimensions a	Non-instrument				Non-precision approach			Precision approach category		
								I		II or III
	Code Number				Code Number			Code Number		Code Number
	1	2	3	4	1,2	3	4	1,2	3,4	3,4
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
CONICAL										
Slope	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Height	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	100 m
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m
Radius	2000 m	2500 m	4000 m	4000 m	3500 m	4000 m	4000 m	3500 m	4000 m	4000 m
INNER APPROACH										
Width	—	—	—	—	—	—	—	90 m	120 m	120 m
Distance from threshold	—	—	—	—	—	—	—	60 m	60 m	60 m
Length	—	—	—	—	—	—	—	900 m	900 m	900 m
Slope								2.5 %	2%	2%
APPROACH										
Length of inner edge	60 m	80 m	150 m	150 m	140 m	280 m	280 m	140 m	280 m	280 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10 %	10 %	10%	10%	15 %	15%	15 %	15 %	15 %	15%

First section										
Length	1600 m	2500 m	3000 m	3000 m	2500 m	3000 m	3000 m	3000 m	3000 m	3 000 m
Slope	5%	4%	3.33 %	2.5%	3.3 3%	2%	2%	2.5 %	2%	2%
Second section										
Length	—	—	—	—	—	3600 mb	3600 mb	12000 m	3600 mb	3600 mb
Slope	—	—	—	—	—	2.5 %	2.5 %	3%	2.5 %	2.5%
Horizontal section										
Length	—	—	—	—	—	8400 mb	8400 mb	—	8400 mb	8400 mb
Total length	—	—	—	—	—	15000 m	15000 m	.5000 n	15000 m	15000 m
TRANSITIONAL										
Slope	20 %	20 %	14.3 %	14.3 %	20 %	14.3 %	14. 3%	14.3 %	14. 3%	14.3%
INNER TRANSITIONAL										
Slope	—	—	—	—	—	—	—	40 %	33.3 %	33.3%
BALKED LANDING SURFACE										
Length of inner edge	—	—	—	—	—	—	—	90 m	120 m	120 m
Distance from threshold	—	—	—	—	—	—	—	c	1800 md	1800 md
Divergence (each side)	—	—	—	—	—	—	—	10 %	10 %	10%
Slope	—	—	—	—	—	—	—	4%	3.3 3%	3.33%

a. All dimensions are measured horizontally unless specified otherwise.

b. Variable length (see Regulation 101 or 102).

c. Distance to the end of the strip.

d. Or end of runway whichever is less.

e. Where the code letter is F (Table S11-1), the width is increased to 140 m except for those aerodromes that accommodate a code letter F aeroplane equipped with digital avionics that provides steering commands to maintain an established track during the go-around manoeuvre.

Note: See Circular 301 and 345, and Chapter 4 of the PANS-Aerodromes, Part I (Doc 9981) for further information

Source: ICAO Annex 14

- Developers should make formal applications to KCAA for any proposed structure detailing the following;
    - Coordinates in WGS-84 format
    - Proposed height required
    - Purpose/use of the proposed development
    - Proposed plans.
    - Letter of no objection from relevant authorities
- Developments that extend above a take-off climb surface within 3000 m should be marked and lighted.
- Developments beyond the limits of the OLS, which extend to a height of 150 m or more above ground elevation should be regarded as obstacles, unless an aeronautical study indicates that they do not constitute a hazard to aeroplanes.
- Overhead wires, cables and their supporting towers that are crossing a river, waterway, valley or highway should be marked and lighted if an aeronautical study indicates that they could constitute a hazard to aircraft.

Note: KAA has the ultimate responsibility of controlling obstacles on airport property and arranging the removal or lowering of existing obstacles outside the airport boundaries

5.7 Maritime and Inland Water Transport

Standards and Guidelines

- Observe a riparian reserve of 300m from the highest water mark.
- Regulate permissible developments within the riparian reserve.
- Regulate developments to ensure the required visibility to the aid to navigation is maintained.
- Designate land use with consideration of the existing rail lines, roads, ports, harbours and waterways.
- Undertake a bathymetric survey for proposed developments.
- Map and prepare action plans for accident-prone areas to
- Designate spaces for emergency response and health facilities.
- Prepare comprehensive oil pollution emergency plans and fire control plans
- Prepare a navigational approach plan to aid in clear navigation access from the water site

- Designate spaces for bunkering, waste reception facilities, oily waste reception facilities, sewerage reception and garbage waste.
- Identify and map ecologically and environmentally sensitive areas and prohibit development in these areas.
- Conduct EIA and EA for proposed and existing projects respectively
- Encourage afforestation and re-afforestation of mangrove forests and coastal strand vegetation (papyrus, reeds) to reduce weather and climate-related impacts.
- Prohibit all effluent into the sea
- In determining the port size, the following factors should be considered:
    - Passenger carriers, vessel sizes and handling equipment
    - Road and rail access
    - Safety and emergency facilities
    - Utilities
    - Parking and loading/unloading spaces
    - Ancillary facilities such as shelters, lighting, security facilities, markings and signage and seating.
    - Routes and destinations
    - Security and administrative facilities
    - Frequency of service
    - Seaports and marine terminals

Disaster Risk Management and Climate Change Adaptation

Table 21: Disaster Risk Management and Climate Change Adaptation for Physical Infrastructure

SECTOR	DISASTER RISK	MITIGATION/ADAPTATION
Transport	Climate change hazards: • Flooding • Wind • Fire • Landslides • Hailstones • Tsunami	• Identify and map areas prone to climate-related disasters • Incorporate climate adaptation strategies during the preparation of physical and land use development plans • Designate sites for evacuation routes and shelters • Conduct suitability analysis to locate physical infrastructure • Encourage design and construction of structures that can withstand disasters

SECTOR	DISASTER RISK	MITIGATION/ADAPTATION
		• Create buffer zones around transport infrastructure • Regulate land uses in disaster-prone areas • Regulate activities that might direct water to transport infrastructure • Observe and maintain riparian reserves as provided in this handbook • Encourage afforestation and re-afforestation of mangrove forests and coastal strand vegetation (papyrus, reeds) • Encourage Investment in blue carbon credit programs • Encourage geo-engineering methods of carbon sequestration within the marine ecosystem • Set up mechanisms for the reception of early warning
	Accidents	• Map accident-prone areas and provide warning signs • Prepare multi-hazard emergency response plans • Designate space for non-reflective traffic signs and non-directional signs • Designate space for NMT such as pedestrian walkways, cycling paths and footbridges • Designate sites for safety, rescue and evacuation stations along highways and bus termini, bus rapid transit stations, parking facilities and roadside stations • Designate sites for the location of designated pedestrian drop-off and pick-up points for public transport • Ensure proper signage with safety information. • Provide over-passes and under-passes • Provide space for emergency routes rolled development at level crossing reserve (diamond) • Regulate developments within the protected surfaces around airports • Map areas along the flight paths that are likely to cause accidents due to human settlements and sensitize the public on the same • Prepare a physical and land use development plan to guide developments around the transport corridors • Designate sufficient space for well-functioning termini
	Fire	• Designate sites for fire stations to serve transport infrastructure • Designate sites for the establishment of rescue centres. • Designate space for fire assembly points • Map out shipping and pipeline routes to safeguard vessels from oil and gas leaks. • Designate escape routes

SECTOR	DISASTER RISK	MITIGATION/ADAPTATION
	Pollution – air, water noise and solid waste	• Conduct EIA to assess the suitability of infrastructure • Designate sites for waste recycling bins • Encourage the provision of barriers with vertical gardening and green shelter roofs to absorb carbon gases • Encourage the greening of major highways • Encourage the provision of noise deflectors • Ensure proper scraping and disposal of marine vessels as per the provision of the Nairobi Convention on wreck removal. • Encourage the practice of 4Rs (Reduce, Reuse, Recycle and Recover) • Encourage adoption of international instruments for managing transboundary waste
	Insecurity	• Provide solar-powered streetlights • Designate space for administration in roadside rest stops • Designate escape routes in facilities
	Environmental degradation and loss of biodiversity	• Identify and map extremely sensitive sea areas such as coral, turtle breeding grounds, fish breeding grounds • Conduct Environmental Impact Assessments and Environmental Audits on proposed and completed projects. • Encourage rehabilitation and restoration of vegetation cleared for road construction. • Undertake appropriate landscaping schemes along the road • Designate space for waste management • Ensure that 10 percent of the sites are covered by vegetation • Map out shipping routes to ensure that they don't infringe on areas of biodiversity.
	Human-wildlife conflict	• Establish wildlife migratory corridors and pastoralists movement corridor • Provide a buffer around wildlife conservation areas

Source: Physical Planning Team; 2022

5.8 Advertisements

Standards and Guidelines

5.8.1 Billboards

- Observe a minimum distance of 250m between billboards along classes S, A and B roads and those within 1Km radius of the boundary of a municipality, town or market centre irrespective of the classification of the road.
- Observe a minimum distance of 100m between billboards along urban trunk road corridors and railway corridors
- Prohibit billboards in residential areas, rooftops or recreational areas.
- Erect within 70m of traffic control lights and not less than 100m from the outer width of a roundabout.
- Prohibit display within 30m of the carriageway on national trunk roads
- Billboards should be buttressed from the roadsides to avoid incidences of falling on the carriageway.
- The maximum height shall be 12m with a clear height of 2.1m.
- The maximum area of billboards shall be $120m^2$.
- Regulate the number of billboards and roadside advertising screens to reduce obstruction, and negative visual effects and enhance road safety.
- Prohibit placement of billboards on overhead footbridges to enhance pedestrians' security and avoid obstruction to motorists.

5.8.2 Animated billboards

- Ensure that all lighting associated with a billboard is not directed at approaching pedestrians, cyclists and motorists.
- Animated billboards shall follow all outlined standards and guidelines for billboards.

5.8.3 Balloon advertisements

- Observe a maximum height of 30m above the ground for an onsite captive balloon advertisement
- Prohibit displaying a conservation area, world heritage site or gazetted national monument.

- Balloon advertisements are subject to the regulations under the Civil Aviation Act (No. 21 of 2013)

5.8.4 Banners

- Prohibit the display of more than two advertisements in respect to the same matter in an urban area of maximum control such as conservation areas and in areas of scenic beauty.
- Prohibit the display of more than four banners in respect of the same matter in an urban area of partial control and minimum control

Note:

1. ***Areas of Maximum Control***
   Advertisements in these areas are strictly controlled to ensure that they do not intrude into, dominate or derogate in any way the character or quality of the environment. High-impact advertisements are strictly prohibited in these areas.
2. ***Areas of Partial Control***
   Advertising in these areas is permitted after environmental impact assessments.
3. ***Areas of Minimum Control***
   High-impact advertising signage will be permitted in this area subject to compliance with the specified conditions by the counties.

5.8.5 Construction site hoarding advertisements

Observe a minimum surface area of $50m^2$. Ensure construction site hoarding advertisements are non-reflective to avoid flash or glare to pedestrians, cyclists and motorists.

5.8.6 Construction site notice

Ensure the onsite construction notice that is displayed before the commencement of construction measures 1.2m by 0.7m and a height of 1.7m from the ground as illustrated in Figure 19.

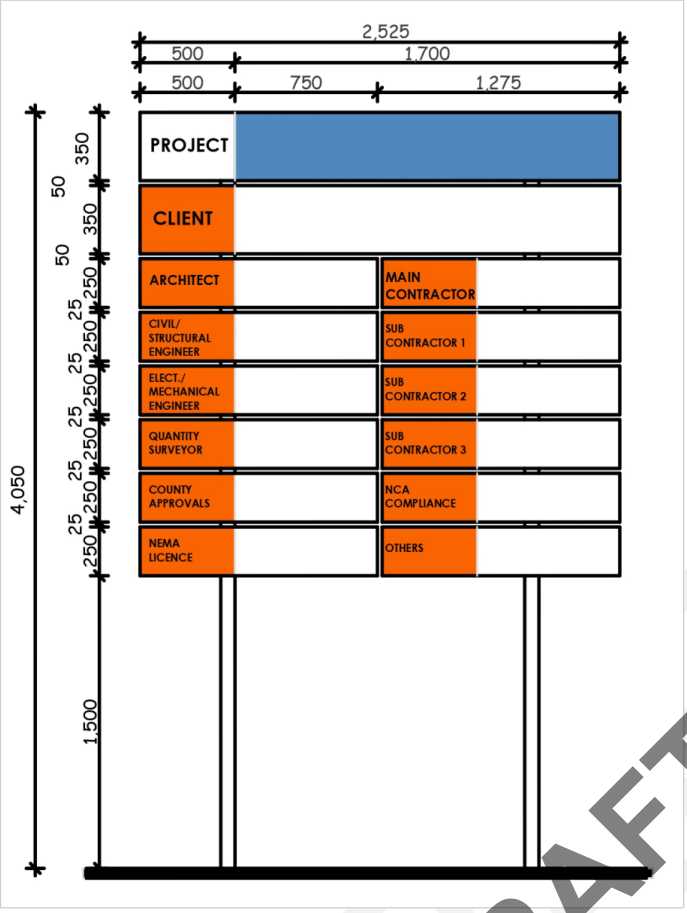

Figure 19: Illustration of a construction site board
Source: The National Building Code, 2022

5.8.7 Election posters

- Observe a maximum surface area of 6m^2
- Election posters are permitted on undeveloped land, streets and sidewalks.
- Prohibit display along reserves of a national trunk road
- Ensure that they are placed in an orderly manner.

5.8.8 Beam advertisements

- The artificial canvasses for projected media such as laser graphics and digital video projections should measure 5m to 30m in height and 10m to 60 m in width.
- Beam advertisements shall be restricted to commercial nodes

5.8.9 Illuminated advertisements

- Advertisements with two panels at an angle to each other, the illuminated area should be capable of being viewed at any one time at any angle not exceeding 40 degrees to the normal.
- Ensure luminance does not exceed 5,000 cd/m² during the day.
- Ensure the fascia panel does not extend more than 0.25 of a meter from the wall.
- Ensure a projecting sign, does not exceed 0.25 of a metre between the two sides.

Table 22: Illumination requirements

Illuminated Area (m²)	**Zone 1 (areas where adequate street lighting is provided)** **(cd/m²)**	**Zone 2 (all the poorly lighted and unlit areas of an area i.e., areas where there is no street lighting or where street lighting is negligible)** **(cd/m²)**
	A candela per square meter (cd/m²) is a recognized measure of brightness. It measures the amount of light emitted in a given direction for a given unit area of the sign surface	
Up to 0.5	2,000	1,000
0.5 - 2	1,600	800
2 - 5	1,200	600
5 - 10	1,000	600
Over 10	800	400

Source: Physical Planning Team; 2022

5.8.10 Advertising vehicles

- Ensure that the advertising panel or portion of the vehicle used for transit advertising shall not exceed a cumulative total of 18m² per panel.
- Ensure that advertising vehicles are not placed/parked on a public road or within a road reserve or walkways.
- Ensure advertising vehicles parked on private property for storage shall be positioned in such a manner as not to be visible from any street.

5.8.11 Wall wraps

- Observe a maximum total area of 20m^2
- Observe a 15m setback from the frontage of the building concerned.
- Signs attached to a bridge shall not exceed 80m^2 in an area of partial control or 200m^2 in an area of minimum control.

- Prohibit covering of any windows or other external openings of a building to avoid obstruction of view.

5.8.12 Sign boards

- Ensure that sign boards displaying the name of a residential building, the name of the person owning or managing a building, a logo, telephone number do not not exceed 0.6m by 0.45m.
- Advertising signs on verandas and canopies should have a clear height of at least 2.75m and not more than 1m between top of the sign and the lower edge of the canopy.

5.9 Telecommunication Lines and Cables

5.9.1 Overhead Cables

Standards and Guidelines

- Ensure a minimum pole span length of 40m - 55m and 60m- 64m for aerial cable routes and drop wire routes respectively.
- Observe the minimum vertical clearances for overhead cables as illustrated in Table 23:

Table 23: Minimum Vertical Clearance for Overhead Cables

S/No.	Vertical Clearance	Minimum Height (M)
1.	Railway crossings	6.1
2.	Plantation railways crossings	4.88
3.	Road crossings	4.88
4.	Along-side town road	3.66
5.	Along-side country roads	3.05
6.	Across country	3.05

Source: Physical Planning Team; 2022

- Observe the minimum horizontal clearances for poles planted close to the railway permanent way, as provided in table 24.

Table 24: Minimum Horizontal Clearance for Overhead Cables

S/No.	Horizontal Clearance	Minimum Height (M)
1.	Inside stations	2.44m
2.	Outside the station	The pole length+1.83m

Source: Physical Planning Team; 2022

- Observe a minimum height of 7.32m for poles erected where there is vegetation of any significant height under the pole routes.
- Provide a minimum horizontal separation distance of 1.5h where power lines and communications cables run on the same side of the road or street, where h is the height of the telecommunications pole and H is the height of the power pole, whichever is greater. This is illustrated in Figure 20.

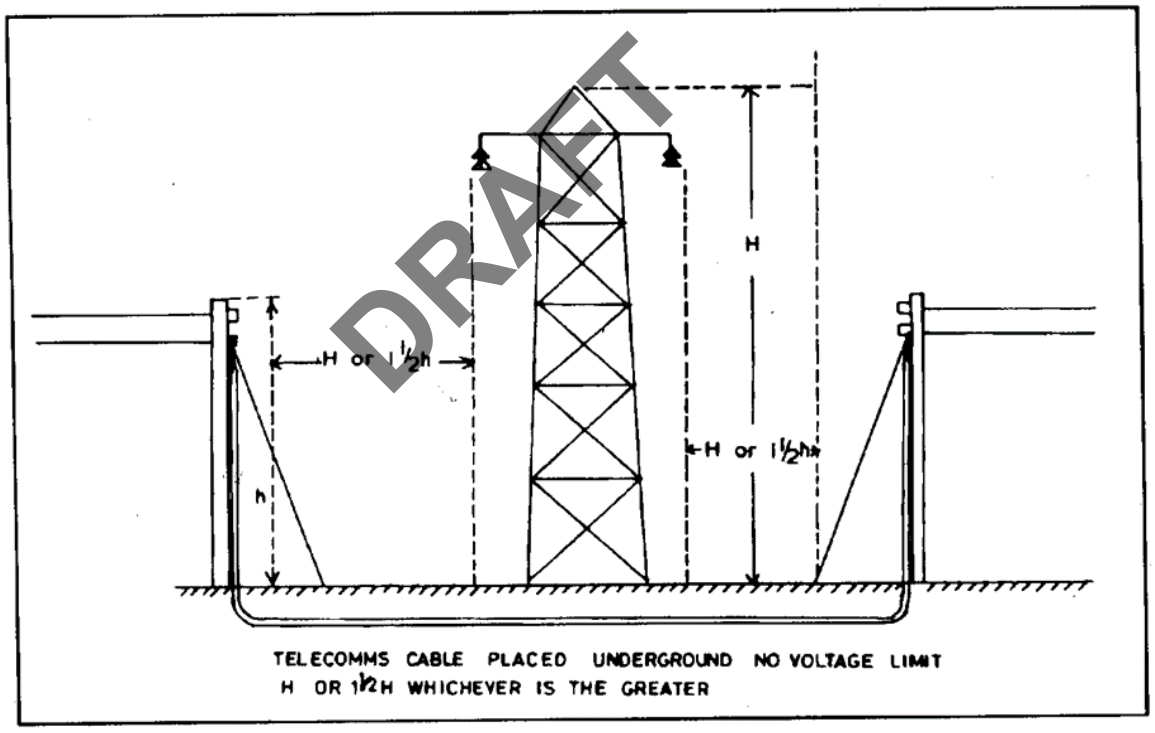

Figure 20: Horizontal Separation Distance for Telecommunication and Power Masts
Source: Guidelines for Supply Installation and Maintenance of External Communication Infrastructure (CCK, 2012)

- Observe a vertical clearance of between 0.61m-3.05m, where power wires and communications cables run on the same side depending on the voltage on the power line as illustrated in Table 25 and Figure 21
- Utilize road reserve space for telephone lines and cables

Table 25: Minimum Vertical Clearance from Power Lines

S/No.	Power Voltage	Vertical Clearance (m)
1.	High voltage (HV) exceeding 66 kV	3.05
2.	High voltage (HV) exceeding 11 kV but not more than 66 kV	1.83
3.	High voltage (HV) exceeding 650V but not more than 11kV	1.22
4.	Medium voltage (MV) exceeding 250V but not more than 650V	0.610
5.	Low voltage (LV) not exceeding 250V	0.610

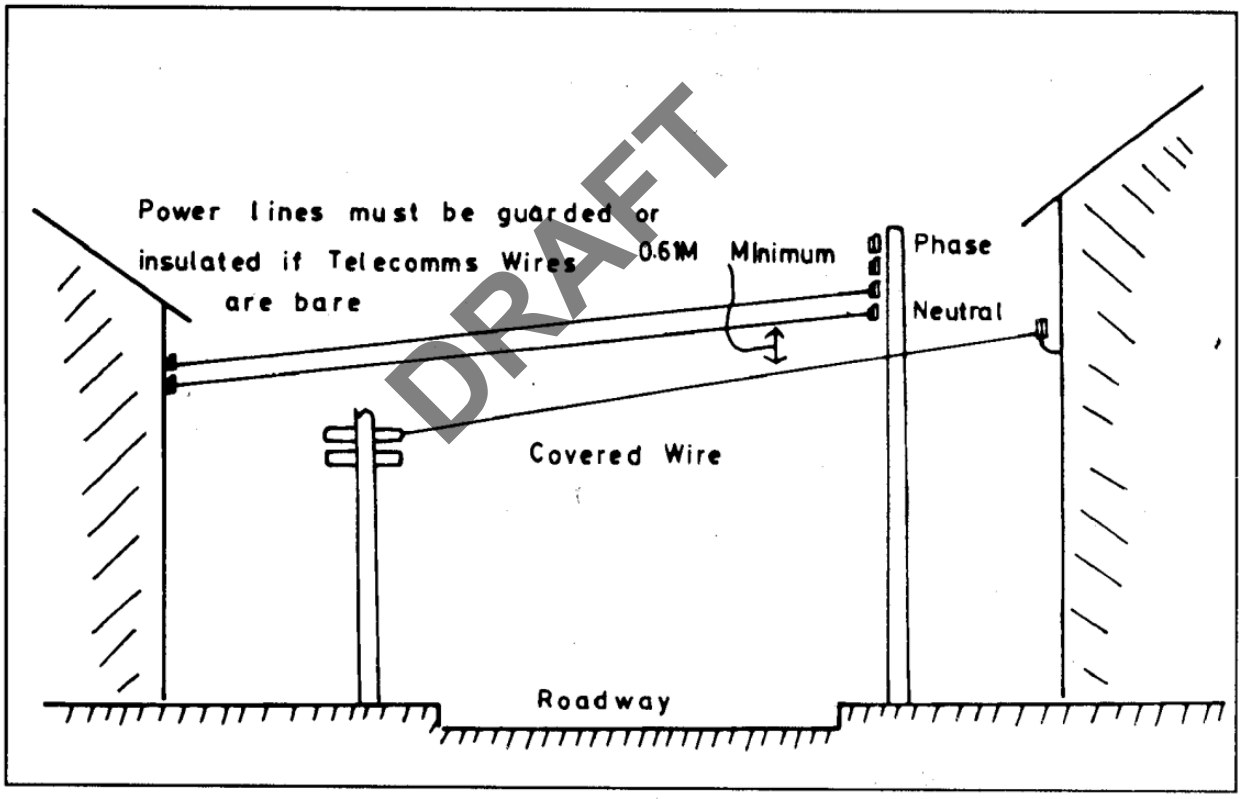

Figure 21: Minimum Vertical Clearance from Power lines

Source: Guidelines for Supply Installation and maintenance of External Communication Infrastructure (CCK, 2012)

5.9.2 Underground Cable Ducts

Standards and Guidelines

- Provide a minimum wayleave of 3m for the installation of underground telephone lines and cables within the road reserve space
- Provide a clearance of between 0.46m to 1.22m between power cables and telecommunication cables when planning a cable run as illustrated in Figure 22.

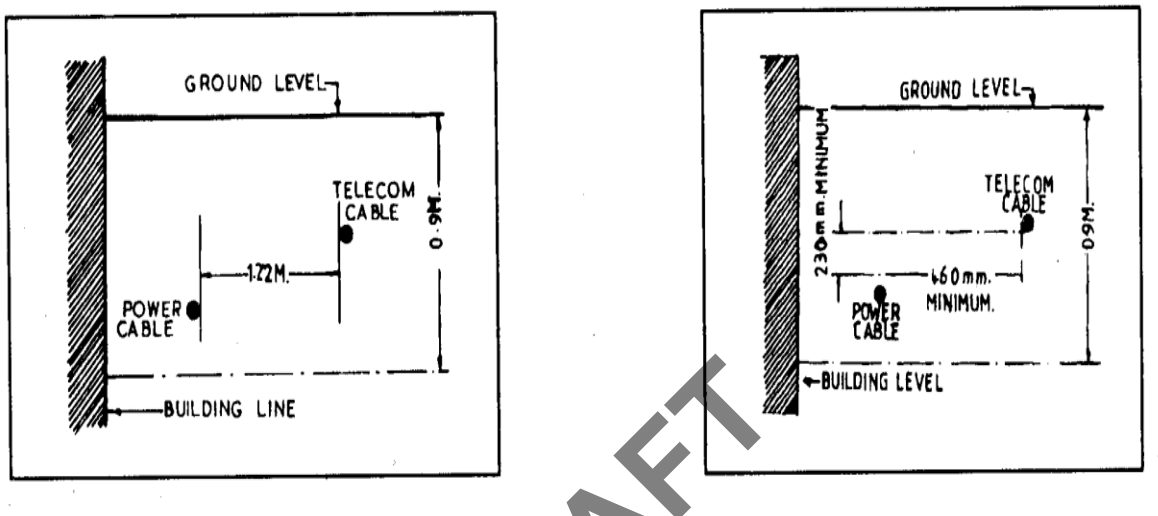

Figure 22: Clearance between power cables and telecommunication cables

Source: Guidelines for Supply Installation and Maintenance of External Communication Infrastructure (CCK, 2012)

- Reserve one side of the road for underground power cables and the other side for underground telecommunication cables.
- Provide cable chambers at a spacing of not more than 150m unless limited by:
    - Length of conduit that can be rodded
    - Obstructions and change of direction.
- Provide a minimum clearance of 0.025m of ducts and cables laid directly in the ground from water mains, service pipes, sewers, subways and jointing chambers belonging to other utilities.

5.9.3 Communications Masts, Base Stations and Towers

Standards and Guidelines

Table 26 provides general standards and guidelines for communications masts, base stations and towers in relation to setbacks, accessory utility buildings, parking, and height among others.

Table 26: Standards and Guidelines for Communications Masts, Base Stations and Towers

Setbacks	• Set back towers at a distance equal to 1.5 times the fall zone of the tower from any residential structure and/or property line. • Encourage the location of towers in existing forested areas with a minimum depth of 30m. The tower may have a 20% reduction in the required setbacks. • In industrial areas, towers may encroach into the rear setback area, provided that the rear property line adjoins another industrially zoned property and the tower does not encroach upon any easements. • Set back all proposed towers, masts and support structures from adjoining parcels, recorded rights-of-way and road and street lines with the following distances • Towers shall not be located between a principal structure and a public street, with the following exceptions: ○ In industrial zones ○ On sites adjacent to public streets on all sides
Accessory utility buildings	• Design utility buildings to blend in with the surrounding environment • Observe the minimum setback requirements of the zones
Parking	• Provide a minimum of one space per user on the facility site. • Prohibit vehicle storage • Provide access by a gated, all-weather gravel or paved driveway
Visual appearance	• Enhance compatibility with the surrounding natural or built environment by designing structures and equipment that use materials, colours, textures, screening, and landscaping that minimize the visual impact.
Separation	• Observe a minimum separation distance of 2km between new towers and existing masts.
Height	• Ensure that the maximum height for a telecommunication tower does not exceed 150m. However, towers exceeding 150 m may be approved by CAK and other relevant authorities provided that it: ○ Will not be detrimental to public health, safety or general welfare. ○ Will not have a negative effect on the neighbourhood. ○ It is in conformity with the planning guidelines of the particular area or with any other applicable laws or guidelines • Prohibit the erection of telecommunications towers above 25m in height in residential areas.

Screening	• Locate all towers as well as guys and guy anchors within the buildable area of the property and not within the front, rear, or side building setbacks. • Ensure that the screening of telecommunications masts and towers conforms to the following: o Surround the base of all telecommunications towers with an opaque screen of a minimum of 2.5m height. o Use of barbed wire or other security fencing material may be allowed. o Screening requirements provided above may be waived if the design of the tower is found to be compatible with the adjacent land uses.
Signage	• Prohibit signs, including commercial advertising, logos, political signs, flyers, flags, or banners, except warning signs, on any part of an antenna or communication tower.
Proximity to Power Lines	• Provide a minimum distance of a tower to a high-voltage electrical power transmission line of 120% of the height of the tower. • Prohibit construction of towers in proximity to high voltage (11Kv and above) electrical power transmission lines.
Prohibited uses	Prohibit the erection of towers and masts within the following developments: o School compounds o Clinics, dispensaries, and hospitals o Aviation fields o Close to high-voltage electrical power lines o Flood prone areas o Landmarks

Source: Physical Planning Team; 2022

- Other considerations include:
    - Preserve anything of heritage significance (built, cultural and natural);
    - Provide accessibility of fire tenders and fuel tankers
    - Use prescribed colours and aircraft warning signs in accordance with standards and guidelines provided by Kenya Civil Aviation Authority (KCAA)
    - Apply for approval from KCAA for structures within a 15km radius of aerodromes
    - Install tower masts on the highest point for highly populated urban areas and on high ground for rural areas
    - Encourage tower and mast sharing
    - Require EIA before approval of development.

Disaster Risk Management and Climate Change Adaptation

Communications Masts, Base Stations and Towers may pose disaster risks, which need to be mitigated. Table 27 provides the mitigation measures for these risks.

Table 27: Disaster Risk Management and Climate Change Adaptation for Telecommunication Lines and Masts

Risks	Mitigation
Radiations emitted by the Base Transceiver Station (BTS) to the adjacent population	● Observe a minimum separation distance of 2km between two masts. ● encourage infrastructural co-location and sharing
Destruction of lives and property in surrounding areas.	● Set back towers at a distance equal to 1.5 times the fall zone of the tower from any residential structure and/or property line ● Provide site accessibility by Fire Tenders ● prohibit construction close to high-voltage power lines ● Provide a minimum distance of a tower to a high-voltage electrical power transmission line at 120% of the height of the tower.
Threat to air safety	● Prohibit towers within airport hazard overlay areas. ● Limit mounted lighting to red flashing lights and use non-reflective materials.
Clearance of vegetation and destruction of biodiversity	● Provide a minimum right of way of 3m for the establishment of trunk and distribution telephone infrastructure through designated underground ducts ● Greening and landscaping of affected project sites for screening and beautification ● Require EIA & EA for all the proposed and existing sites
Pollution resulting from diesel-run generators used to run the masts	● Encourage the use of green energy such as solar power for masts ● Require EIA & EA for all the proposed and existing sites

Source: Physical Planning Team; 2022

5.10 Oil and Gas Transmission Pipelines

Standards and Guidelines

- Provide a minimum 30m right-of-way for pipeline transmission.
- Crossing of oil pipelines by other infrastructure shall be at 90 degrees.

- Maintain a minimum distance of 10m from the edge of the pipeline wayleaves for excavations other than quarrying and encourage rehabilitation of excavated sites.
- Prepare a comprehensive emergency plan for upstream, midstream and downstream stages for pipelines.
- Obtain work permits from the relevant authorities before any work is carried out within oil pipeline wayleaves.
- Fit overhead power and telecommunication lines that cross the pipeline with reflector balls.
- Protect pipeline reserves from activities that pose public safety risks, including vehicle parking, planting of deep root trees, above-ground fuel tanks and construction of roads and buildings.
- Encourage recreational activities and facilities such as linear parks and recreational paths in the vicinity of pipeline right-of-way
- Prohibit structures and uses such as schools, hospitals, and nursing homes and high-density residential near transmission pipelines.
- Designate fire breaks
- Ensure pipelines running on the surface of the water bed are anchored
- Observe the following setback requirements from the right of way as illustrated in Table 28:

Table 28: Pipeline Setback Requirements

S/No.	User	Setback (M)
1.	Homes, businesses, and places of public assembly	15
2.	Community recreation areas	7.5
3.	Telephone, fibre optic cables and linear walkways	3

Source: Physical Planning Team; 2022

Disaster Risk Management and Climate Change Adaptation

Table 29: Disaster Risk Management and Climate Change Adaptation for Transmission Pipelines

Risk	Mitigation
Breakage, leakage and spillage	• Encourage the development and modernization of transmission infrastructure to include early warning systems • Encourage continuous monitoring of the transmission pipelines • Encourage cleaning and restoration of affected sites

Fire	• Provide appropriate setbacks as per table 28 • Regulate land uses to limit the densities as per the approved physical and land use development plans around pipeline areas • Designate fire breaks in pipeline transmission areas
Destruction of biodiversity	• Require EIA &EA for all the proposed and existing pipelines
Natural disasters such as Earth Quakes	• Develop resilient climate-proofed pipeline infrastructure

Source: Physical Planning Team; 2022

5.11 Electricity Supply

5.11.1 Overhead Cables

Standards and Guidelines

The minimum recommendations for horizontal right-of-way required for overhead lines are specified in Table 30. In addition to the minimum recommendations, the actual right-of-way can vary depending on the topography, structure type, span length, and other factors that might be determined by the service provider:

Table 30: Minimum Horizontal Right-of-Way for overhead power lines

Voltage Levels	**Supporting Structure**	**No. Of Circuits**	**Way Leaves Trace Widths (M)**
11kV		Single or double	10
33kV		Single or double	10
66kV:		Single circuit,	10
		Double circuit on single structure	12
		Double circuit running in parallel	20
132Kv:	Self-supporting monopole	Single circuit all conductors on one side of the pole	10
		Single circuit with phases balanced on both sides of the pole	12
132kV	Lattice tower	Single Circuit on one pole	30
		Double circuit on one pole	40
		Double circuit, running in parallel	60

Voltage Levels	Supporting Structure	No. Of Circuits	Way Leaves Trace Widths (M)
220Kv:	Lattice tower structure	Single Circuit on one pole	30
		Double circuit on one pole	40
		Double circuit, running in parallel	60
400Kv:	Lattice steel structure	Double circuit on single tower	45
		Single circuit	40
		Double circuit	60
500HVDC		Double circuit	60

Source: Kenya Power and Lighting Company

Note. *Wayleaves exceeding the above provisions shall be as demarcated in the Survey maps*

- Observe the following minimum setbacks to fuel and gas tanks as shown in Table 31:

Table 31: Minimum Setbacks to Fuel and Gas Tanks

Voltage Levels	0.4 kV	15 kV	30 kV	132 kV	220 kV	400 kV
Horizontal Clearance from power line conductors to petrol tanks and vents (m)	15	15	15	15	15	20

Source: Kenya Power and Lighting Company, 2022

Recommended minimum vertical clearances shall be as in Table 32:

Table 32: Minimum Vertical Clearances from power cables

Description of Clearance	Minimum clearance (m) at 400KV	Minimum clearance (m at 275KV
To ground	7.6	7.0
To normal road surface	8.1	7.4
To road surface of designated '6.1m high load' routes	9.2	8.5
To motorway or other road surface where Sky cradle can be used	10.5	9.8
To motorway road surface where scaffolding is to be used: (i) Normal 3 lane motorways (ii) Elevated 2-lane motorways	16.3 13.3	15.6 12.6

To any object on which a person may stand including ladders, access platforms, etc.	5.3	4.6
To any object to which access is not required and on which a person cannot stand or lean on a ladder.	3.1	2.4
To trees under or adjacent to the line and: (i)Unable to support ladder/climber (ii) Capable of supporting ladder/climber (iii) Trees falling towards line with line conductors hanging vertically only	3.1 5.3 3.1	2.4 4.6 2.4
To trees in orchards and hop gardens	5.3	4.6
To irrigators, slurry guns and high-pressure hoses	30.0	30.0
To street lighting standards with: (i) Standard in normal upright position (ii) Standard falling towards line with line conductors hanging vertically only (iii) Standard falling towards line	4.0 4.0 1.9	3.3 3.3 1.4

Source: Kenya Power and Lighting Company

● Leverage on existing rights of way including roads and rail when the power lines parallel this infrastructure. Permit activities including yards, gardens, pastures and short crop farming, recreational fields, streets, roads, driveways, and parking lots among others on the right-of-way.

- Prohibit users that could interfere with a power line operation within the right-of-way including buildings, swimming pools, above-ground fuel tanks, tall signs or billboards, tall trees, obstructions, mounding of soil, burning of material, and excavations among others.
- Prohibit the location of poles:
    - Within 1m of a driveway crossover
    - At road intersections where visibility may be reduced for road users
    - In positions that inhibit access to underground services
    - Within the projection of other utility easements
- Locate power lines in corridors screened by vegetation or natural landscape
- Encourage installation of new transmission lines along existing power line corridors

5.11.2 Underground Cables

- Underground cables shall utilize the road reserve space, and where cables traverse private/public property, the necessary approvals should be sought.
- Maintain minimum depth for underground lines for safety purposes, as specified in Table 33:

Table 33: Minimum Depth for Underground Cable Ducts

Voltage levels	240v	11kv	33kv	66kv	132kv	220kv	400kv
Minimum depth of burial(m)	0.3	1	1	1.2	1.5	1.5	2m

Source: Kenya Power and Lighting Company

- Maintain a minimum depth of 0.8m for cables crossing the road.
- Ensure that cables crossing the road are buried through steel or concrete conduit ducts.
- The minimum proximity limits to other facilities in joint-use manholes and vaults shall be as specified in Table 34.

Table 34: Horizontal Separation in Co-Shared Power Lines Ducts

Voltage levels	**0.4 kV**	**15 kV**	**30 kV**	**110 kV**	**220 kV**	**400 kV**
Surface-to-surface clearance (m)	0.15	0.15	0.23	0.3	0.6	0.6

Source: Kenya Power and Lighting Company

- Maintain minimum clearance heights over/under other services as specified in Table 35

Table 35: Recommended clearance heights

S/No	**Type of Service**	**Recommended Clearance Or Depth (M)**
1.	Telecommunication cables	2
2.	Telecommunication cables in ducts	0.25
3.	Water pipes	0.5
4.	Oil pipelines	0.5
5.	Fuel storage tanks	1.2
6.	Crossing public roads	1.2
7.	Crossing railway tracks	1.6
8.	Low and medium voltage lines	0.25

Source: Kenya Power and Lighting Company

Submarine Cables: Prepare a site plan showing coordinates for the entire route and its proximity to sensitive areas, e.g., coral conservation areas, existing submarine services, and water intake among others.

- Require EIA and soil survey to be conducted prior to approval and implementation of the project.
- Ensure cables running on the surface of the water bed are anchored
- Ensure development permission is sought from the relevant authorities before the installation of submarine cables.
- Ensure that entry and exit points of submarine cables are marked with visible and distinctive marks

Disaster Risk Management and Climate Change Adaptation

Mitigation measures for disasters and risks associated with electricity supply are provided in Table 3.

Table 36: Disaster Risk Management and Climate Change Adaptation for Power Transmission Lines

Risks	Mitigation
Clearance of vegetation and destruction of biodiversity	• Consider construction techniques that protect the natural environment • Encourage the use of underground cables for service lines within urban areas • EIA & EA shall be undertaken for all the proposed and existing transmission lines
Fires	• Provide fire stations in all urban centres • Designate and develop fire breaks in fire-prone areas • Undertake adequate risk analysis and mapping to identify areas suitable for the construction of transmission lines • Encourage the integration of lightning arrestors in the design of the power poles.
Electrocution	• Ensure that transmission lines are clear of obstructions • Provide adequate way leave clearances of between 5m-60m depending on the line capacity • Prohibit development within wayleaves • Ensure adequate insulation of power conduits

Source: Physical Planning Team; 2022

5.12 Water Supply

General Standards and Guidelines

- Provide sites for water intake, water treatment plants, water reservoirs and communal water points.
- Provide a wayleave for distribution pipes. The main water pipeline requires a way leave of 10m.

- Consider the following factors in the design of a distribution system:
    - Population size
    - Distance from water intake
    - Quality of water/pollution levels
    - Source of water and water intake points
    - Analysis of economic activity whether for industrial, domestic, or irrigation to get demand levels.
    - Gradient/Gravity flow
    - Piping diameter (bigger diameter to carry water for long-distance distribution)
- Refer to the water demand manual when projecting water demand for various land uses
- Ensure that all access and inspection lids in the berm shall be set 50mm above the existing ground level, and for chambers in the carriageway, the lid levels shall be flush with the finished road surface.
- Ensure pipes are buried as follows: large pipes shall be a minimum of 1.2m deep (to leave space for smaller service conduits overhead) and smaller sizes shall be no less than 1m in open country and streets.
- Provide adequate road reserves and ensure utilization of the existing right of ways for laying water mains.
- Locate service chambers away from roadway and traffic to minimize the traffic management required for chamber entry and allow for future road widening.
- All access and inspection lids shall be in place always to ensure the safety for road users.

5.12.1 Water intake

Intakes are used to abstract water from various sources such as lakes, rivers, reservoirs or canals. The intake work for each type of source is designed separately according to its requirements and situations.

- Ensure the structure is easily accessible during floods and does not get flooded
- Provide a protection belt of a minimum of 50m in width.
- Consider the following when locating a water intake:
    - Where there is ample space
    - Near the treatment plant to reduce the cost of conveyance of treated water
    - In the freshwater zone to reduce the load of the treatment work
    - Connectivity to quality infrastructure such as road

- The upstream side of the town/city
- Where the heavy water currents are not able to strike the intake directly
- Where it would collect water even if the water level is still low depending on the type of structure

5.12.2 Water treatment plants

land size, population

Factors to consider when siting a water treatment plant

- Locate the water treatment plant close to the water source where feasible
- Provide a minimum buffer of 100m between treatment plants and the residential areas
- Locate water treatment plants utilizing chlorination at least 300m away from residential areas
- Ensure the topography of the site provides maximum utilization of gravity flow through the entire system. Preferably the site should be gently sloping and well-drained.
- Consider sites whose soils are not highly permeable soils to avoid contamination of groundwater.
- Locate treatment plants downwind to minimize odour and aerosol problems

5.12.3 Water reservoirs

sitting, land size, population,

A reservoir is an artificial lake where water is stored. Most reservoirs are formed by constructing dams across rivers. A reservoir can also be formed from a natural lake whose outlet has been dammed to control the water level.

Guidelines and Standards

- Subject reservoir site to detailed geologic, geodetic, and seismic studies for feasibility decision.
- Regular observations must be continued during the reservoir operations
- Provide a 100M buffer around the reservoir from the highest water point mark
- Encourage a vegetative management program to prevent soil erosion around the reservoir (on the buffer).
- Encourage installation of drains to relieve water pressure and other flood mitigation measures
- Prohibit settlements along the spillways and downhill of the reservoir.
- Consider the following factors when siting reservoirs:

- projected volumes of water to be stored
- The water-holding capability of the soil that is, the hills surrounding the reservoir and the bed of the reservoir should be impervious.
- Availability of good storage capacity with minimum submergence of the adjacent land.
- Loss of reservoir water- Availability of deep gorge which results in larger capacity with lesser water surface area and, therefore, lesser evaporation loss.
- The cost of other associated works is less.
- land use, where land further away from residential, non-intensive agriculture, and economic areas is preferable
- Where possible, the site should be close to compatible users such as; valuable land being used for agriculture, forestry, communication and large industries with high water demand.
- Sedimentation- Avoid siting reservoirs downstream of tributaries that bring in excess sediment into the river.
- Avoid sites with the possibility of landslides into the reservoir.
- Seismicity- Avoid sites with high seismic activity
- Avoid sites with mineral deposits in and around the reservoir.

5.12.4 Service reservoir/ water tanks

Elevated storage tanks are recommended for all water supply utilities. In particular, hospitals, institutions and industrial plants should be provided with separate elevated storage tanks. The minimum space requirements are 0.1 ha.

5.12.5 Public Water Points

- Locate water points in areas that are accessible to all and well-lit to ensure the safety of users.
- Maintain a maximum walking distance of 500 m between any household to the nearest water point.
- The recommended maximum number of people per water source shall be as shown in Table 37:

Table 37: Maximum Number of People per Water Source

Number of people	Water flow
250 people per tap	based on a flow of 7.5 litres/minute
500 people per hand pump	based on a flow of 16.6 litres/minute
400 people per single-user open well	based on a flow of 12.5 litres/minute

Source: The sphere handbook; 2018

***Note**: These guidelines assume that the water point is accessible for approximately eight hours a day only.*

5.12.6 Boreholes

- Locate boreholes away from the coast, and any wetland, stream, river, spring and other abstractions to avoid any reduction in stream or spring flow, or water level in nearby wetlands and other abstractions, and to avoid 'pulling in' seawater into the aquifer.
- Locate boreholes up the slope and with a minimum distance of 50m from sources of contamination such as septic tanks, slurry pits and poorly drained areas, which receive contaminated run-off.
- Provide a 10m buffer around the borehole
- Prohibit storage, mixing, spraying, spillage, burying or dumping anything that could contaminate the borehole
- Maintain a minimum horizontal separation distance of 800m between one borehole and the other.
- Ensure assessment of the geophysical properties of the underlying area is done by hydro-geologists to detect natural hazards or man-made infrastructure (pipelines, cables communication lines, etc.)

5.12.7 Dams

- Prepare local physical and land use development plans and integrate management of water catchment area developments around dams
- Prepare Re-settlement Action Plans for any displaced persons.
- Maintain a buffer of 70m as measured from the highest watermark for all dams.
- Maintain a buffer of at least 20m and not more than 100m downstream of the dam, as measured from the toe of the dam
- Prohibit developments within the riparian reserve
- Require Environmental and Social Impact Assessment to be carried out

Disaster Risk Management and Climate Change Adaptation

Table 38 outlines the disaster risk for the water supply sector and the proposed mitigation measures

Table 38: Disaster Risk Management and Climate Change Adaptation for Water Supply

Risks	Mitigation
Pollution	• Locate boreholes at a higher contour in relation to pit latrines and waste disposal sites • Protect and conserve water catchment areas • Treat liquid waste before discharge into water courses • Encourage the use of appropriately treated waste for agriculture • Runoff should be collected in dams
Destruction of water aquifers	• Observe a horizontal separation distance of 800 m between boreholes. • Minimum clearance of 50 m for boreholes from waste dumpsites, and sewer treatment among others.

Source: The Sphere Handbook; 2018

5.13 Sanitation

Sanitation includes the management of wastewater and solid waste. For these to happen sites for sewage treatment works, collection centers/transfer stations, Incinerators, Sanitary landfill and recycling plants and sewerage wayleave are required.

- In settlements where an integrated sewage scheme is not provided provision should be made for septic tanks
- Care must be taken to ensure that sewage effluent does not infiltrate groundwater aquifers in a manner that causes pollution of water sources

5.13.1 Sewerage Treatment Plant

Location

- Provide sewage collection and sewage treatment plants for all settlements with a population of 3,000 or more having an urban layout.
- Provide a distance of 3km to 5km between built-up areas and a sewer treatment plant.
- Provide a minimum distance of 0.3km between rivers and a sewer treatment plant.
- Consider the topography when locating the treatment plants. It is preferable that the sewage flow into the site by the natural slope of the drainage
- Ensure the location of the treatment plant is relatively high in relation to the rest of the land to protect it from rain and floods.
- Locate the treatment plants far away from the city and the network service.
- Provide a minimum 15 m buffer zone between the site and the residential areas. Encourage a tree belt in the buffer zone for protection against blows and for environmental purposes. Locate the treatment plant downwind of the prevailing wind

direction based on the study of wind and climate trends so that foul or distinctive odours are not transmitted to the neighbouring population.

- Locate treatment plants close to infrastructure such as electricity supply and access roads necessary for operation.
- Ensure that the location of the treatment plant does not interfere with the urban plan of the city and its future expansions or infringe on the laws of the protection of agricultural lands.
- Consider future expansion areas needed by the plant for future wastewater collection networks for at least 50 years.
- The location of the final discharge point should be adjacent or close to, the treatment works.
- Take advantage of the state-owned sites.
- Require an Environmental Impact Assessment necessary to identify the site.
- Consider sites whose soils are not highly permeable soils to avoid contamination of groundwater.
- Locate treatment plants downwind to minimize odour and aerosol problems

5.13.2 Public Toilets

Public toilets should be provided for users of public places, such as markets, recreational areas and public transport terminals

Standards and guidelines

- Provide a minimum land size of 0.025 ha for public toilets**.**
- Maintain a minimum distance of 500m between two public toilets in busy commercial and recreational areas.
- Provide a minimum of eight toilets per toilet block
- Provide one toilet/bathroom block for every 100m in informal settlements Provide toilets in every street in all types of centers.
- Locate at least 3m away from adjoining roads
- Consider the following when siting
    - Availability of regular water supply
    - Adequate lighting and ventilation

- Proximity to water sources
- Relatively gentle slope

- Maintain a minimum distance of 30m from the nearest water body

5.13.3 Stormwater drainage

Storm drainage is used to collect and carry rain or surface water to some natural watercourse or body of water to prevent flooding. Storm drainage design must include provisions to adequately control runoff from all public and private streets and the roof, footing, and area drains of residential, multifamily, commercial, or industrial buildings.

- Provide a minimum of 2ha for a stormwater drainage system in major residential areas where annual rainfall exceeds 200mm. However, in smaller residential areas, no storm system needs to be provided
- Provide future extension of the drainage system to the entire drainage basin in accordance with the Physical and land use development plan.
- Ensure that surface or subsurface drainage, caused or affected by changing the natural grade of the ground or removal of natural ground cover or placement of impervious surfaces, does not flow over adjacent public or private property in a volume or location materially different from that, which existed before development occurred.
- Provide wayleaves for an Approved Point of Discharge (APD) including storm drain, existing open channel, creek, detention, or retention pond.
- Provide wayleaves of 3m-4.5m for retention/detention (R/D) facilities or a combination of both to maintain surface water discharge rates at or below the existing design storm peak discharge
- Prohibit development on the wayleave, which may restrict flood flows.
- Ensure that all drains in the Central Business District and major commercial centers are covered and designed to meet flow capacity.
- Maintain a minimum width of 9m access easement from an existing public road to a R/D facility
- Establish vegetation cover on areas disturbed by or on areas of construction to control and minimize erosion, in accordance with NEMA standards.

- Require preparation of an Erosion Control Plan for all projects that may impact the velocity, volume, or quality of surface water on adjacent properties, or which may impact any permanent natural body of water in accordance with NEMA standards.
- Provide control measures for runoff during all three phases of construction ie prior, during and after construction.
- Provide sites for storage of storm waters and propose measures for water recycling.

5.13.4 Solid Waste

There are four major categories of waste: municipal solid waste, industrial waste, agricultural waste and hazardous waste

General guidelines and standards

- Ensure garbage collection sites are environmentally friendly and locate them on the leeward side.
- Establish collection centers/transfer stations at strategic areas within a town.
- Equip these stations with colour-coded or labeled waste receptacles to promote waste segregation.
- Encourage modern automated waste collection and management.
- Provide sites for incineration in facilities that meet the requirements in the Third Schedule of the Environmental Management and Coordination (Waste Management) Regulations of 2006.
- Encourage the sorting of waste at the source.
- Prohibit dumping of waste in open landfills

Neighbourhood waste collection points

- Designate a minimum land size of 0.025ha within residential areas.
- Provide waste collection points within a maximum walking distance of 500m
- Maintain a minimum distance of 350m between one bin and another in low-density residential areas.
- Maintain a minimum distance of 200m between one bin and another in medium-density residential areas
- Maintain a minimum distance of 150m between one bin and another in high-density residential areas

Waste transfer stations

Waste transfer stations are facilities where solid waste mainly municipal solid waste is unloaded from collection vehicles and containers for sorting, recycling and reloading into larger, long-distance vehicles for transport to landfills or other permitted solid waste facilities for final disposal.

Guidelines

- Designate a minimum land size of 0.1ha within industrial areas
- Maintain a minimum radius of 25km away from residential areas.
- Ensure the waste is transferred within 2 days.

Sanitary land fills

- Designate a minimum land size of ha.
- Integrate the sanitary landfills in the local physical and land use development plan
- Integrate the sanitary landfills with recycling plants
- Consider the following when siting a landfill;
    - Ease of vehicle access;
    - Drainage,
    - Flooding and landslide risk;
    - Proximity to settlements and cultivated land,
    - The porosity of substrate and depth to groundwater.
    - Proximity to airports, water sources and conservation areas
- Locate
    - On a fairly flat or a depression needing
    - In an area with good vehicular access to a main road
    - Away from water sources to ensure safety from seepage
    - Away from environmentally fragile areas and restricted areas
- The site should be free from visual pollution
- Provide a 100m buffer and encourage a tree belt in the buffer zone for protection against blows and environmental purposes.
- Consider future expansion areas needed by the facility for at least 50 years.
- Ensure that sites are secured and manned to discourage scavenging and exposure to hazardous chemicals.
- Require a plan for decommissioning a landfill
- Require onsite monitoring of environmental systems to check for groundwater contamination and emission of ground gases.
- Prohibit household hazardous waste such as paints, cleaners, chemicals, pesticides, motor vehicle oils and batteries.

- Prohibit disposal of household appliances such as refrigerators and window air conditioners that rely on ozone-depleting refrigerants.

5.13.5 Radioactive Waste Management

Radioactive waste is a result of many activities, including nuclear medicine, nuclear research, nuclear power generation, rare earth mining, and nuclear weapons reprocessing. Radioactive waste management refers to the safe treatment, storage, and disposal of liquid, solid, and gas discharge from nuclear industry operations to protect people and the environment

Guidelines

- Designate waste and disposal sites suitably in underground repositories.
- Require EIA for all establishments that process, use, deal in or handle radioactive materials.
- Encourage material recycling to minimize waste.
- Ensure landfill sites and decommissioned nuclear plants are clearly marked and fenced with warning signs against radioactivity on the site.
- Ensure continued monitoring of disposal sites in decommissioned nuclear plants
- Ensure no wildlife areas and residential developments are established within a 10 km radius of hazardous waste landfill site.
  Provide a 50m wide buffer around the site that should be greened and secured to keep out people and animals.

5.13.6 Electronic Waste Management

Electronic waste or **e-waste** describes discarded electrical or electronic devices. E-waste is created when an electronic product is discarded after the end of its useful life. Informal processing of e-waste can lead to adverse human health effects and environmental pollution. E-waste management is a process of collecting e-waste, recovering and recycling material by safe methods, and disposing of e-waste by suitable techniques to reduce its adverse impacts on the environment.

Guidelines

- Designate areas for household hazardous waste drop-off stations (HHDS).
- Designate areas for dismantling, recycling and disposing of electronic waste.
- Ensure that computers and other e-waste are not incinerated, put in landfills or melted down.
- Prohibit the emission of fumes, gases, and particulate matter into the air, and the discharge of liquid waste into water and drainage systems or on agricultural land during recycling activities.

- Maintain a minimum distance of 10km radius between the e-waste recycling sites and residential developments.

5.14 Educational Institutions

Educational institutions include pre-primary schools, Primary schools, junior and senior secondary schools, special schools and tertiary institutions (universities, colleges, and research institutions, Technical and Vocational Education and Training (TVET)).

General guidelines

- Prepare site layout plans for all educational institutions
- Provide ramps access to every building.
- Encourage greening and landscaping.
- Reserve land for educational purposes in areas of greatest residential expansion and adjacent to community centres, libraries
- Consider the use of multi-campus schooling arrangements where two or three schools e.g. primary and secondary share sites and facilities.
- Ensure separation of vehicular and pedestrian traffic.
- Integrate with major open spaces whenever possible to encourage the sharing of open spaces and playgrounds with members of the public.
- Provide adequate support amenities and utilities such as playgrounds, offices, halls, libraries, sanatoriums, parking, water, electricity/lighting, and solid waste disposal among others
- Prohibited uses surrounding the school include large-scale commercial activities, industries, transportation and warehouses, animal rearing, slaughterhouses, crematorium/cemeteries, bars and offensive billboards.

Siting criteria

- Consider
    - The spatial distribution of existing schools using Geographical Information System(GIS)
    - Availability of suitable and adequate land
    - Availability of utilities including water, electricity, internet, incinerator and sewer among others.
    - Topographic characteristics such as gentle undulating slope
    - Proximity to residential areas and community facilities

- Compatibility with the surrounding land uses
- Accessibility

- Undertake a graphical analysis of demographic data to determine the catchment population and potential demand for enrolment.

5.14.1 Pre-Primary Education

These are preparatory schools where children between 4-6 years are taught before joining primary schools. It is desirable that a pre-primary school is attached to a primary school.

Standards and Guidelines

- Observe land requirement of 0.15ha-0.25ha
- Ensure that one pre-primary school serves a catchment population of 2500.
- Locate
  - Within a neighbourhood with easy vehicular and pedestrian access
  - Away from industrial areas, wetlands or forest reserve
- Encourage integration of pre-primary schools with primary schools for easy transition.
- Maintain a maximum distance of 1 km between two schools.
- Observe a maximum walking distance of 500m
- Ensure that the maximum number of pupils per class is 25
- Ensure the minimum circulation space per pupil is $3m^2$
- The ideal classroom design is a rectangle measuring 10m by 7.5m by 3m height
- Provide 1 sanitation facility for every 10 girls including a shower room.
- Provide 1 sanitation facility for every 20 boys including a urinal and a shower room
- Ensure that all schools have outdoor soft playing areas.
- Prohibit storey buildings for pre-primary schools

Table 39: Summary of planning standards for pre-primary school

Land requirements	**Space requirements and facilities**	**Surrounding Permitted uses**	**Prohibited uses**
0.15-0.25 Ha	Soft play area (grass) 246.00m² • Swing/seesaw 28.60m² •Sand pit 28.60m² • 10% circulation space 24.60m² Kitchen 9.10m² • Office/store 10.20m² • Classroom @ 75.0 m² • Sanitation block 15.30m² • Parking 104.92m²	Residential developments ▪ Corner Shops ▪ Clinic ▪ Educational Facilities ▪ Public Open Spaces	Large-scale commercial activities, Highly pollutant industries, Transportation Warehouses, Animal rearing, Slaughter houses, Hospitals, Crematorium/cemeteries, Bars Offensive billboards.

Source: The Planning team; 2022

5.14.2 Primary Schools

Standards and Guidelines

- Observe a minimum size of 3.9ha for a multi-stream high-rise primary school
- Provide an additional 0.8ha for the accommodation of teaching staff.
- Provide an additional 0.4 ha for every 200 students to accommodate dining halls and dormitories in a storied building for boarding schools.
- Provide 0.4 – 0.8 ha for agricultural demonstration plots (school gardens) where applicable.
- Ensure that one primary school serves a catchment population of 3000 in rural areas and 5000 in urban areas.
- Locate
    - Within a neighbourhood with easy vehicular and pedestrian access
    - Away from industrial areas, wetlands or forest reserves
- Maintain a maximum distance of 4 km between two schools

- Observe a maximum walking distance of 2 km.
- Ensure that the maximum number of pupils per class is 40.
- Ensure the minimum circulation space per pupil is 5 m2
- The ideal classroom design is a rectangle measuring 15m × 13m × 3m
- Maintain the number of floors at Ground+2 for classroom vertical developments
- Maintain single storey buildings for Art and Craft workshops
- Provide
    - adequate spaces in common areas for mobility and air circulation
    - land for future expansion.
    - double or triple streams.
    - facilities for safe pick-up, drop off and parking
- Provide sanitation facility for every 10 girls' including a shower room.
- Provide 1 sanitation facility and urinals for every 20 boys'.
- Provide amenities such as playgrounds, classroom blocks, offices, libraries, etc.

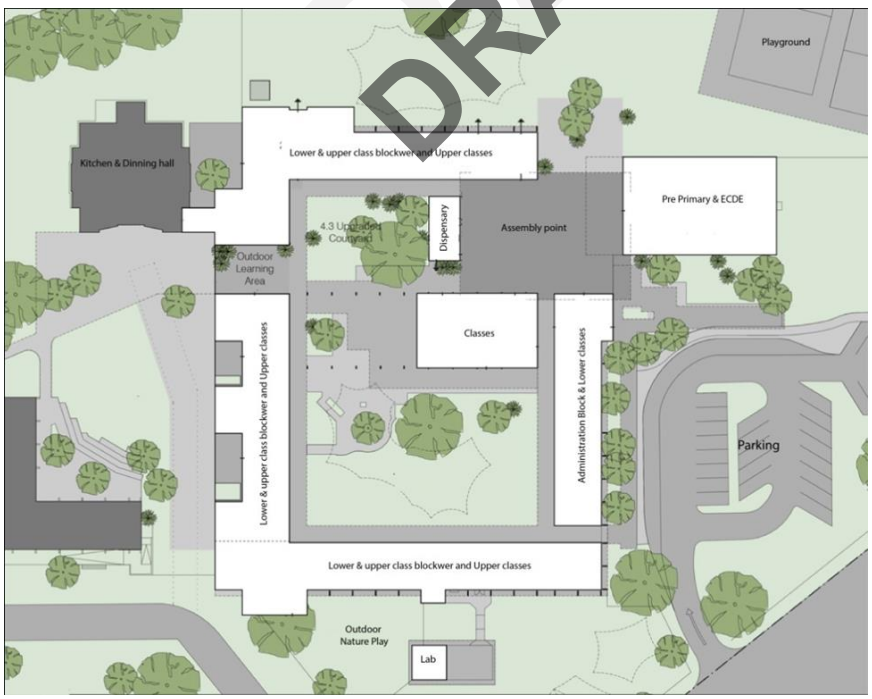

Figure 23 : Illustration of a primary school site layout plan
Source: Physical Planning Team; 2022

Table 40: Plot Areas for Primary Schools

Facilities	**Single stream-Day(ha)**	**Single Stream-Boarding(ha)**	**Double stream-Day(ha)**	**Double stream-Boarding(ha)**
Classrooms hall, administration	1.8	1.8	3.6	3.6
Playing fields, gardens	2.1	2.1	2.1	2.1
Dormitories	-	0.4	-	0.4
Staff Accommodation	-	0.8	-	0.8
Plot area	**3.9**	**5.1**	**5.7**	**6.9**

Source: Safety standards manual for schools in Kenya, 2018, Ministry of Education

5.14.3 Secondary Schools

Standards and Guidelines

- Maintain a minimum land size of 3.5 ha for double-stream mixed secondary school and 4.5 ha for triple-stream mixed secondary school
- Provide an additional 10% of the land size for agricultural demonstration plots.
- Allocate additional land of 1ha for staff housing.
- Locate
  - In close proximity to residential areas and community facilities.
  - Within a neighbourhood with easy vehicular and pedestrian access
  - Away from industrial areas, wetlands or forest reserves
- Integrate with major open spaces whenever possible to encourage the sharing of open spaces and playgrounds with members of the public.
- Maintain a maximum distance of 6 km between two schools
- Observe a maximum walking distance of 3km.
- Ensure that one secondary school serves a catchment population of 6000 in rural areas and 8000 in urban areas
- Ensure that the maximum number of students per class is 40
- Ensure the minimum circulation space per pupil is $6m^2$
- The ideal classroom design is rectangle measuring 16m × 14m × 3m
- Encourage the vertical concept of buildings with the maximum number of floors at Ground+3
- Provide 1 sanitation facility for every 8 girls' including a shower room.
- Provide 1 sanitation facility and urinals for every 20 boys'.
- Provide students' dormitories, teachers' quaters, laboratories/workshops and places of worship.

Table 41 : Summary of The Planning Standards

Catchment population	**No. of secondary school**	**No. of streams**	**Area ha**	**Walking distance.**
2500	1	1	3.4	500m-3km
5000	1	2	3.5	
7500	1	3	4.5	

Source: Ministry of Education

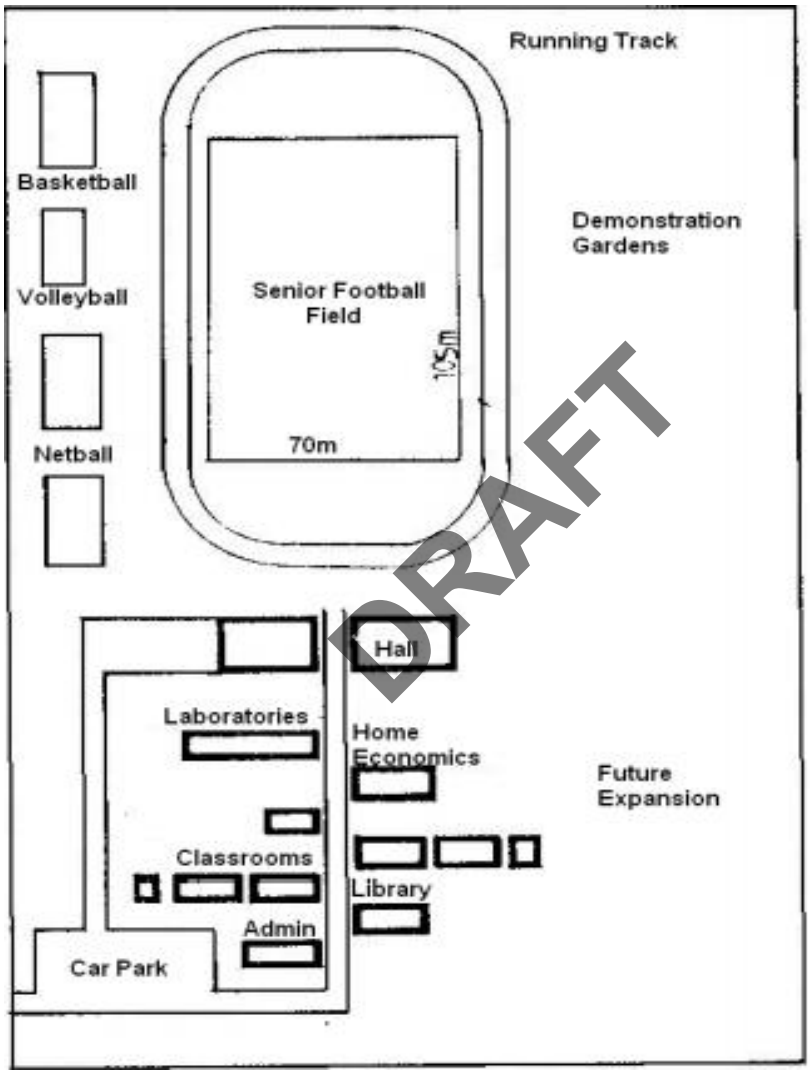

Figure 24: Illustration of a site layout plan for a secondary school
Source: Physical Planning Team; 2022

5.14.4 Tertiary Institutions (Universities, Colleges, TVETS, Research Institutions)

General Standards and Guidelines

- Locate the institutions
    - in easily accessible areas near community facilities
    - In areas well served by public transport.
    - In areas free of pollution from noise, smoke, odour and dust
    - Away from industrial areas, wetlands or forest reserves
    - In safe areas.
- Provide the following facilities
    - Classroom or Lecture rooms
    - Departmental areas, staff offices and seminar rooms
    - Central Administration offices
    - Library and ICT centres
    - Laboratories
    - Workshops
    - Research centres
    - Auditorium or Lecture theatre
    - Staff common rooms.
    - Kitchen and dining facilities.
    - Student common rooms with indoor recreational facilities
    - Outdoor recreational facilities in the form of games or sports facilities
    - Water supply, sewage treatment plants and drainage system,
    - Students' accommodation, including adequate laundry and storage facilities
    - Places of worship
    - Health facility
    - Research stations
    - Student centre with restaurants and shops.
- Locate in proximity to a police station
- Prohibit highly pollutant industries, warehouses, crematoriums, cemeteries, animal husbandry and mining activities.
- In areas with access to physical infrastructure including roads, electricity, and water among others.
- Develop workshop buildings with heavy machinery and frequent deliveries as single-storey buildings and separate them from the other buildings.
- Consider the provision of accommodation facilities for the case of satellite campuses (town campuses)

i. Colleges

Standards and Guidelines

- Provide a minimum land size of 10 ha.
- Locate medical training colleges within the National Teaching and Referral hospitals and County referral hospitals

Table 42 : Land requirements

S/No	Facility	Land requirement
1.	Classrooms	224m^2
2.	Tennis court	528m^2
3.	Swimming Pool	500
4.	Gymnasium	1188m^2
5.	Circulation area	5760m^2
6.	Science rooms	843m^2
7.	Agriculture room	281m^2
8.	Home science room	562m^2
9.	Art & Craft	562m^2
10.	Playfields	17,100m^2
11.	Learning resource centre	150
12.	Administration block	200m^2
13.	Multi-purpose Hall	1093m2
14.	Ablution block	67m2
15.	Boarding facilities	2 Ha.
16.	Teaching staff quarters	2.5 Ha. (Flats)
17.	Non-teaching staff	0.4 Ha.
18.	Agriculture extension	2ha

Source: Physical planning team, 2022

ii. Universities

Standards and Guidelines

- Prepare a site layout plan
- Provide a minimum land size of 50ha consisting of the following:
    - 20 ha or more to support up to 5000 students for main campuses.
    - 2ha or more for auxiliary services e.g., pre-primary and primary schools, daycare facilities, and staff quarters.
    - 2ha or more for open spaces and car parking exclusively.

- 2ha of land set aside for a sewerage plant where there lacks a local authority sewerage system.
- 5ha or more for outdoor sports for 5000 students
- A University offering agriculture as a course should provide 10 ha of land for a farm.

- Encourage vertical development to save on space.

5.15 Libraries/Resource Centre

Standards and Guidelines

- Observe a minimum land size of 0.4 ha.
- Locate centrally in or near commercial centres, institutions and residential areas to promote optimal use.
- Locate in a safe and secure place.
- Ensure that the site offers maximum silence but at the same time is conveniently situated in relation to the population it serves.
- Ensure that the site has good lighting and ample surrounding air space.
- Provide facilities such as parking, meeting rooms, electricity, water, waste disposal points, and sewerage systems among others.

5.16 Community Centres

Community centres are an integral part of a residential neighborhood. They include social halls, libraries and cultural museums. The dominant use is recreation although they accommodate a small element of administrative offices.

Standards and Guidelines

- Maintain minimum land size of 0.25haand 1 ha for a social hall and community centre respectively.
- Provide one community centre for a catchment population of 20,000.
- Locate
  - Central to the catchment population and along main pedestrian routes,
  - In proximity to existing services such as electricity, water, public transport among others.

- Within 400m walking distance from public transport stops.
- A safe and secure environment, especially for night users (incorporating crime prevention through design principles).
- Near open spaces to allow for related outdoor activities
- Near safe drop off/pick up areas and pedestrian access

- Cluster with other facilities, such as shops, schools, childcare centres, community health facilities and public libraries to promote convenient access and create a focal point for community activity.
- Encourage landscaping using screen mounds, hollows, low walls in children's playgrounds, fountains, trees and bushes among others.
- Provide facilities such as a restaurant, children's play areas, sanitation blocks, lactation and changing rooms.
- Provide adequate parking spaces as stipulated in Table 19.

5.17 Sporting Facilities

5.17.1 Playgrounds

Standards and Guidelines

- Provide a minimum of 0.5 ha per 1000 persons out of which of 0.15ha will be dedicated for children's playground
- Provide the sporting facilities using the measurements in table 42 below.
- Locate
  - In a relatively flat and well-drained area.
  - Near educational and social facilities to encourage sharing of the facilities and interlink them with parks and other public spaces.
  - In areas accessible by public transport and non-motorized transport.
  - In a safe and secure environment.
- Distribute the sports fields and sports pitches evenly throughout urban residential areas.
- Orient the playfields such that players do not face the sun during games.
- Provide support facilities such as sanitation blocks, and eateries.
- Ensure that the design of the facilities is per the National Building Code, 2022

Table 43: Land Requirements for Sporting Facilities

Sporting facility	**Length(m)**	**Width(m)**	**support facilities**
Football pitch	Maximum 120m Minimum 90m	Maximum 90m Minimum 45m	sanitation block, eateries, changing rooms
Rugby pitch	Not exceeding 100m	Not exceeding 70m	sanitation block, eateries, changing rooms
Athletics field	The track should be 400m Have 6- 8 lanes of a standard width of 1.22m. The tracks should be on the outer sides of a football pitch.		sanitation block, eateries, changing rooms
Netball court	30.5	15.5	sanitation block, eateries, changing rooms
Volleyball court	18	9	sanitation block, eateries, changing rooms
Tennis court	24	11	sanitation block, eateries, changing rooms
Handball pitch	20	10	sanitation block, eateries, changing rooms
Badminton	13.4	6.1	sanitation block, eateries, changing rooms
Squash Court Squash box (ground surface) Wall	9.7 64	6.4 4.5	sanitation block, eateries, changing rooms
Basketball court Board	26 1.8	14 1.2	sanitation block, eateries, changing rooms
Swimming pools Olympic size Short course Diving pool	50.1 m 25.1	21.1 by 8 Lanes Optional	-Diving Tower to be above the deep end -Elevation of Tower must not exceed 10m
Springboard ceiling	-3m	-	
Skating rink			
Children playground	-	-	Slides, bouncing castles, trampoline

Source: Physical Planning Team; 2022

5.17.2 Stadiums

A stadium is a place for outdoor activities such as sports, concerts, or other events and consists of a field or stage either partly or completely surrounded by a tiered structure for spectators. When combined with, a yachting marina, indoor games, hard courts, swimming pools, golf and putting ranges it forms a sports complex.

Standards and Guidelines

- Provide a minimum of 6ha for an international stadium and 3ha for local stadiums.
- Locate
    - On a reasonably flat land
    - In areas accessible to its client base
    - In a safe, comfortable and functionally efficient location
    - In close proximity to compatible land uses such as educational facilities
- International stadiums should have a minimum capacity of 40,000 persons. Stadiums hosting quarter-finals must have a minimum of 60,000 and those hosting the opening ceremony or final must have a capacity of at least 80,000
- Provide ancillary services such as water supply, electricity, waste disposal points, car parks, and restaurants among others.

Zoning of a stadium

- Model a stadium into five zones to enhance safety. as described below.
    - Zone 1- The activity area (that is the central area and/or pitch on which the games take place.
    - Zone 2- The spectator terraces.
    - Zone 3 -The squares surrounding the activity area such as restaurants, accommodation facilities, shops, sporting museum and other social areas.
    - Zone 4-The circulation area surrounding the stadium structure and separating it from the perimeter fence.
    - Zone 5- The open space outside the perimeter fence and separating it from the car parks.

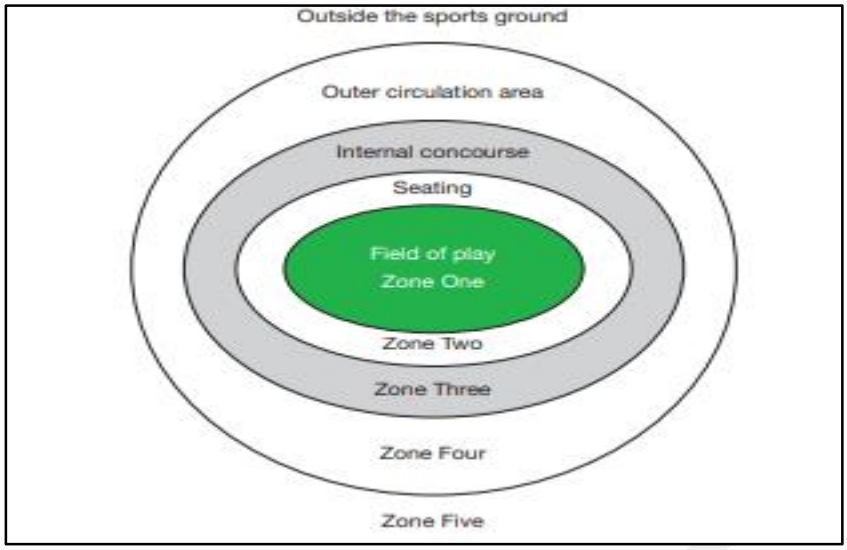

Figure 25: illustrates the zones of a stadium
Source: Physical Planning Team; 2022

5.17.3 Golf course

Standards and Guidelines

- The number of 'holes' and their length determines the size of the golf course. For instance, a 9-hole and 18-hole golf course requires minimum land sizes of 12 ha and 48.5 ha respectively.
- Provide a 9-hole a for a catchment population of at least 100,000.
- Provide the minimum land requirement of 48.5 ha.
- Prepare a site layout plan identifying areas for restoration, replanting and enhancement of riparian habitat. Ensure it is surrounded by a forest or light tree cover with natural features such as streams, lakes, sand, etc. with a maximum tree canopy coverage of 60%.
- Establish golf courses on slopes, which are not more than 20%. Portions of the course may be sited in areas with slopes exceeding 20%, provided that those portions require minimal grading.
- Avoid the location of golf courses, clubhouse facilities, or parking lots in an area requiring substantial alteration of the existing terrain or vegetation.
- Locate clubhouse facilities and other noise-generating uses and facilities away from land users who may be impacted.
- Provide appropriate landscaping for the clubhouse and all other buildings.
- Preserve significant natural features such as rock outcroppings, and natural riparian areas.

- Permit facilities such as clubhouses, lakes including those for non-commercial fishing, parking lots, water wells, and on-site identification signs.
- Consider using the golf course to enhance conservation areas.

5.18 Health Facilities

Gaps

1. Parking space
2. Catchment population
3. Walking distance

Hierarchy of Health Facilities

The Kenyan health system defines six levels of the hierarchy from the lowest to the highest, as follows:

- Level 1-Community health facilities
- Level 2-Dispensaries and clinics
- Level 3- Health centres, maternity and nursing homes
- Level 4-Sub- County hospitals and medium-sized private hospitals
- Level 5-County referral hospitals and large private hospitals
- Level 6- National Teaching and Referral hospitals and large private teaching hospitals

Standards and Guidelines

- Provide minimum land sizes as illustrated in Table 45
- Provide a minimum land size of 0.1 ha for veterinary clinic.
- Site considerations
    - Topography,
    - Relatively well-drained area to avoid flooding,
    - Soil conditions,
    - Availability of public utilities such as water supply, sewer system, electricity, and solid waste management system among others.
    - Natural features

- Locate
    - In areas with adequate access.
    - Away from railroads, freight yards, children's playgrounds, airports, and industrial and disposal plants.
    - In pollution-free areas such as air, noise, water and land pollution
- Prohibit direct access to highways

The standards and guidelines are summarised in the table below:

Table 44: Summary of planning standards for health facilities

Facility	**minimum land size**	**Catchment Population**	**Distance (radius)**	**Basic facilities**
National Teaching and Referral Hospital	20Ha	1,000,000	-	water supply, sewerage system, approved waste disposal system, incinerator electricity, parking space, optic fiber telephone, laundry staff accommodation, morgue,
County referral hospital	8 Ha	500,000	-	As above
Sub County hospital	4 Ha	100,000-500,000	8 Km	Water supply, sewerage system, approved waste disposal, incinerator, electricity, parking space, optic fiber telephone, canteens
Health centre	3 Ha	25,000	2 Km	Water supply, sewerage system, approved waste disposal, incinerator, electricity, parking space, optic fiber telephone,
Dispensary	2 Ha	10,000	1Km	Water supply, sewerage system, approved waste disposal, incinerator, electricity, optic fiber telephone
Community health facilities	0.2ha			Water supply, sewerage system, approved waste disposal, incinerator, electricity, optic fiber telephone

Source:

5.19 Care Facilities for the Elderly

The elderly are senior citizens who are not able to take care of themselves either physically or financially.

Standards and Guidelines

- Provide a minimum land size of 1ha.
- Locate
    - Within a neighbourhood, with access to medical facilities.
    - In a serene environment
    - In a relatively flat and well-drained area.
    - In areas accessible by public transport.
- Provide facilities such as common rooms, dining rooms, sleeping areas, open gardens, prayer rooms, laundry facilities, medical facilities, and parking.

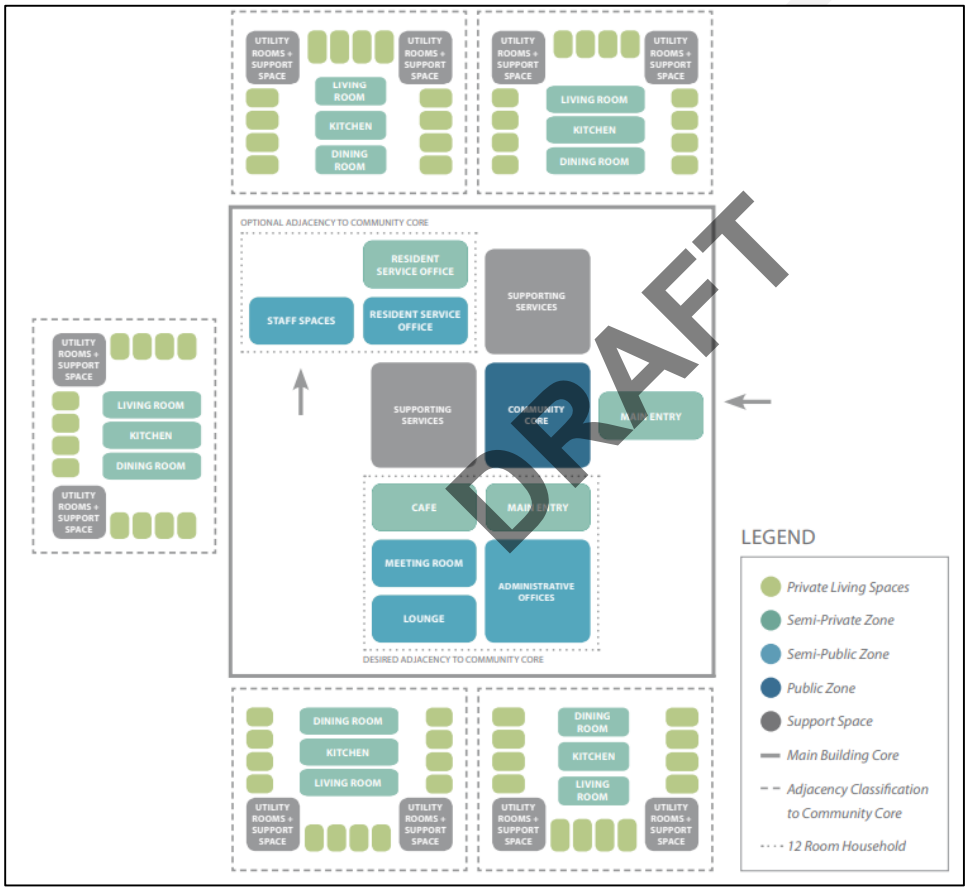

Figure 26: Illustration of a site layout plan of a care facility.

Source: Physical Planning Team; 2022

5.20 Funeral Establishments

- Funeral establishments can be divided into three categories depending on size, facilities, location, population, level and number of health facilities around it.

- Category I & II are independent/ standalone funeral establishments while Category III is usually attached to health facilities.

Standards and Guideline

The land requirements and facilities for the various categories are provided in Table 45:

Table 45: Land requirements and facilities for Funeral Establishments

Category I (1 Ha) Do a benchmark with KU	**Category II (1 Ha)**	**Category III (0.6 Ha)**
Administration Offices Chapels Family room Preparation room Selection room/casket display room Comfort room Garage Parking area Viewing room (optional) Embalming room	Administration offices Chapels Family room Selection room/casket display room Comfort rooms Viewing room (optional) Parking area	Casket display area Business area Storage room Parking area

Source: Physical Planning Team; 2022

- Maintain a minimum distance of 200m between funeral establishments and health facilities, food establishments such as restaurants and food processing zones such as abattoirs.
- Maintain a minimum distance of 500m between funeral establishments, and schools
- Ensure compatibility with neighbouring land uses.
- Provide adequate utilities such as water, waste disposal, sanitation, electricity and incinerators.
- Locate in an enclosed and safe environment.
- Require Environmental Impact Assessments or Environmental and Social Impact Assessments
- Provide buffer to neighbouring land uses such as green belts, roads or high walls above 2.1m.
- Ensure accessibility via public transport
- Prohibit direct access through major highways.

5.21 Cemeteries

Standards and Guidelines

- Provide minimum land requirement based on the catchment population as shown in Table 46.

Table 46: Land Requirements for Cemeteries

Catchment population	Size(ha)
1-5,000	0.5 to 1.
5000-15000	1 to 1.5
Upto 100,000	10

Source: Physical planning team; 2022

- Ensure a maximum of 3m², with outside and inside dimensions of 1.5m by 2m and 1m by 2.4m respectively per grave
- Ensure a minimum excavation depth of 1.5m, which should be filled well and firmly.
- Provide a minimum setback of 3m from the right-of-way for plots fronting roads where no above-ground structure may be constructed.
- Observe a maximum height of 0.6m for structures above ground.
- Ensure a minimum height of 1.5m for a perimeter fence.
- Provide a buffer of 100m, which shall be vegetated with trees.
- Locate
    - On a ground where the water table is not higher than 3 - 4 m below the ground surface
    - Away from rocky grounds.
    - away from areas at risk of flooding
    - In areas with firm and non-porous soils
    - away from water sources to avoid contamination
    - Away from busy routes where funeral processions would not interfere with traffic.
    - Within easy commuting distance of population centres
    - At the periphery of urban areas
- Require an EIA.
- Prohibit direct access through major highways
- In rural areas where land is available, cemeteries may be included in the area for hospitals and religious institutions
- Decommissioned cemetery sites shall be available for other uses such as parks, car and lorry parks.

5.22 Crematoriums

Standards and Guidelines

- Maintain a minimum land size of 0.4 ha.
- Provide a buffer of 200m from a crematorium
- Encourage modern and efficiently operated crematoriums
- Locate
    - In areas accessible by public transport
    - In a woodland setting, or an area of undulating ground with good natural features
    - In areas with adequate water, electricity and drainage services.
- The direction of the prevailing wind should be taken into account in the selection of a site
- Provide adequate parking.
- Ensure compatibility with neighbouring land uses
- Prohibit direct access through major highways

5.23 Fire Fighting Facilities

General Guidelines

- Ensure the site has access from a major road.
- Provide site utilities such as electricity, telephone, ambulance and water.
- Locate:
    - Away from educational and health facilities
    - In a central and isolated area
- Provide a designated road/lane
- Provide support facilities such as an alarms communication centre, apparatus room, training room, gym and jogging track, staff quarters, dining area, administration, maintenance, storage and repair facilities. Provide hydrants at 120m intervals along major town roads which should be located at a minimum distance of 15m from the nearest building
- Designate space for a firefighting institution for training fire marshals among community members to enhance timely response to fire outbreaks.

i. Fire station

Standards and Guidelines

- Provide a fire station with at least 4 fire engines and at least 60 staff members to serve a population of between 100000-200000.
- Maintain a minimum land size of 0.825ha with 0.4ha for the structure, 0.4ha for staff accommodation and drills and 0.025ha for parking and maneuvering of vehicles.
- Observe a minimum frontage of 47m
- Provide overhead water storage tanks of at least 250,000 litres capacity

ii. Sub fire station

Standards and Guidelines

- Provide a sub-fire station with at least 2 fire engines and at least 30 staff members to serve a population of between 50000-100000
- Maintain a minimum land size of 0.2ha.
- Observe a minimum frontage of 35m.
- Ensure the site has access from a major road.
- Provide overhead water storage tanks of at least 120,000 litres capacity

5.24 Post Offices

i. General Postal Office

Standards and Guidelines

- Provide a general post office to serve a Catchment Population of 35,000 people
- Maintain a minimum land size of 0.5ha
- Locate:
    - In close proximity to the town centre
    - In areas with good vehicular access to major roads and public transport termini.
- Provide basic site facilities such as, parking, electricity, fibre optic, telephone and sanitation.

ii. Neighbourhood postal Office

Standards and Guidelines

- Maintain a minimum land size of 0.1ha
- Locate in areas with good vehicular access.
- Provide basic site facilities such as parking, electricity, fibre optic, telephone and sanitation.

5.25 Administrative Offices

These include National and County Government offices established to provide public services.

Standards and Guidelines

- Maintain minimum land sizes as shown in Table 47

Table 47: Minimum land requirements for administrative offices

Office	**Land size(ha)**
National	40
Regional	20
County	20
Sub-county	10
Ward/Division	5
Location	1
Sub location/	0.2
Village	0.1
Town halls	1.2
County halls	1.2

Source: Physical planning team; 2022

- Maintain a maximum plot coverage of 75% and 60% for the C.B.D and other areas respectively.
- Provide 1 car park for every 200m^2 and 50m^2 of office space in the CBD and in other areas respectively.
- Locate:
    - Centrally from most residential zones, preferably within 45 minutes driving time from most homes in large cities and 45 minutes walking time from home in smaller towns
    - In areas with good vehicular access and accessible via public transport
- Provide basic site utilities such as; water, sanitation, electricity, telephone, fibre optic and passenger drop-off points.

- Permit uses such as; libraries, post offices, police posts, banks, food stalls and restaurants, child care centre, car parks and public open spaces and other services ancillary to government business

5.26 Law Enforcement Facilities

5.26.1 Police stations

Standards and Guidelines

Maintain minimum land sizes as provided in Table 48

Table 48: Land requirements for the various levels of stations

Type	Land size in ha
Police station	2
Police post	0.2
Patrol base	0.1
Police line	0.1-2

Source: Physical Planning Team; 2022

- Locate:
    - In county headquarters, residential neighbourhoods, large commercial/industrial areas or large institutions depending on their functional requirements. If their administrative function is dominant, they may be located in County headquarters but generally, they should be located within residential neighbourhoods.
    - In areas easily accessible to the general population.
- Permit uses such as: chief's offices, retail shops, workshops, places of worship, sports grounds, clubhouses, canteens, education facilities, health facilities, farms, helipads and yards.
- Prohibit uses such as conference halls and restricted areas for shooting ranges

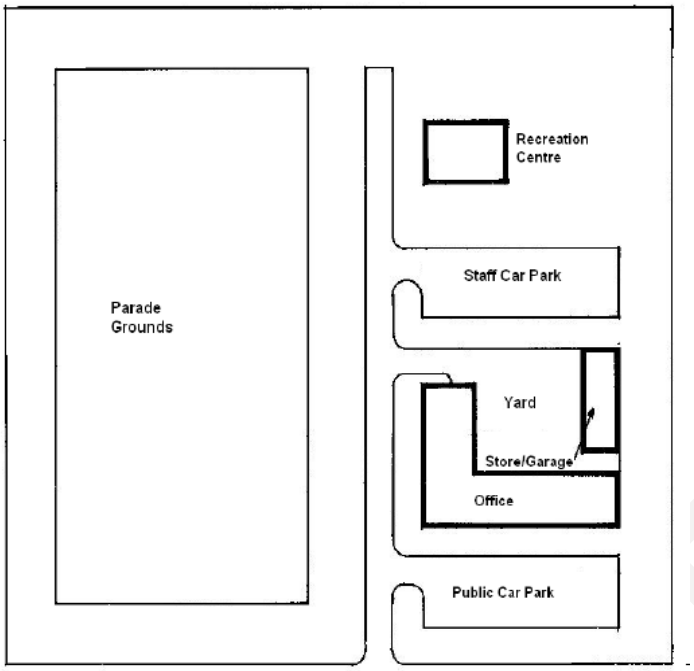

Figure 27: Illustration of a site layout plan for a police station

Source: Physical planning team; 2022

5.26.2 Courts

Standards and Guidelines

- Maintain minimum land sizes as provided in Table 49

Table 49: Land Sizes for courts

Type	Land size (Ha)	Facilities
Supreme Court, Court of Appeal, High Court	2	• Administrative block • Courtroom space for each court sitting • Prisoner holding facilities • Parking
Magistrates court, kadhi court, tribunal, children's court	1	

Source: Physical planning team; 2022

- Prepare a site advisory layout plan.
- Locate in a secure and safe environment.

5.26.3 Correctional Institutions

These include: Prisons, remand centres and borstals (approved schools)

Standards and Guidelines

- Maintain minimum land requirements of 16ha and 2ha for prisons, remand centers and borstal institutions respectively
- Provide a minimum space requirement of 3.7m2 per prisoner for circulation, bed space and storage.
- Locate;
    - Away from wetlands, flood plains, fragile landscapes, or historic/archaeological sites.
    - In a secure environment
    - In areas with access to a road network, electricity, telephone, fibre optic and potable water and sanitation.
    - In areas well serviced by public transport.
- Ensure compatibility with neighbouring land uses. They can co-exist with other government bodies such as the courts and police stations
- Prepare a site layout plan to provide for vehicular traffic access to delivery and collection points, kitchens and workshops, waste collection, maintenance and emergency responses.
- Provide one sanitation facility for every 25 detainees.
- Provide support facilities such as fire service, surveillance, accommodation, workshops, prison farms, conference halls, education facilities, places of worship, water and sewerage systems, electricity, outdoor areas, sports grounds, health-care facilities,
- Ensure the design and provision of facilities consider the needs of Persons Living with Disabilities.
- Prohibit uses in surrounding areas such as major commercial development, educational, warehousing and large markets, transportation and residential other than staff housing.

5.26.4 Military barracks, camps, garrisons, trainings institutions and other installations

Standards and Guidelines

- Factors that will be considered while locating military installations will include:
    - Command responsibility
    - Strategic considerations
    - Proximity to physical infrastructure i.e. transport
    - Availability of state land
    - Socio-economic consideration
    - Regional development considerations
    - Climatology, topography and altitude
    - Environmental and ecological considerations
    - Location of projects of strategic national importance
- Military land is classified based on locations where the specific military activities take place as follows:
  Class A – Physical Garrisons/Bases/Units
  Class B – Training Areas and Reserved Land
  Class C – Temporary Use
  Class D – Special Use Lands/Patrol Bases/Forward Observation Bases
  Class E – Off-Camp Accommodation Areas
  Class F– Safeguarding Areas, Buffer Zones, Easements and Wayleaves
- Military land shall be marked and/or demarcated with appropriate signage/warning notices erected.
- Military shall only be located in environmentally sensitive areas e.g. wetlands, parks, protected forests, conservation areas and human settlements among others in consultation with other state agencies i.e KFS, KWS, NEMA
- Should have appropriate infrastructure services to support and minimize potential negative impacts to the region when they are being established
- Should be isolated from civilians by establishing a safeguarding area as a buffer zone between the military camps and civilian settlements.
- Conduct an Environmental Impact Assessment before the establishment of any military camps and other installations.

- Acquisition of military land shall be done in consultation with relevant agencies and local communities
- Undertake a site layout plan showing support facilities shall as training areas, base areas, administrative areas, maintenance areas and store depots, ammunition depots, weapon ranges, naval bases, air force bases, telecommunication installations and rifle ranges.

Confidentiality of Military land planning

- Military installations are part of Strategic National Installations and information concerning their planning and development will be restricted and shared on a need-to-know basis.
- Generally, development control by Counties and other statutory bodies will not apply to the planning and development of military installations.
- Where discussion on the planning and development of military installations is necessary outside the Ministry, it will be handled, in confidence, by the CS Defence and CS in charge of Physical Planning and the relevant agency(s).
- Where necessary, all plans touching on, relating to, bordering, involving or in any way affecting the KDF, shall be subjected to conditions set by the National Security Council.
- For confidentiality, all plans prepared by or for the MOD-owned lands and installations shall be exempt from any form of publication.
- All plans having an impact on military lands, including lands required for military operations, such as along the country's borders, will be required to be done under the parameters of special planning areas.
- All safeguarding areas in the proximity of military lands and Installations will be required to be planned as Special Planning Areas.
- Military lands will, of necessity, be surrounded by buffer zones which will be co-managed between the military, the counties and other agencies.
- All lands along the Kenyan international borders to provide for an easement of 200m for purposes of military deployment along the border, and regulate type and density of development.
- All Part Development Plans (PDPs) prepared for MOD lands will only be done by the DG PLUPA and in confidence.
- All survey plans prepared for MOD lands will be done by the Director of Survey
- No development will be erected within safeguarding areas without MOD ApprovaL
- All Military land shall be gazetted for protection from unauthorized access to protect the installation as well as for the safety of the public.

- The military will be a key stakeholder in the development of national plans and county plans where they have an interest.
- Acquisition of military land shall be done in consultation with relevant agencies and local communities.

Safeguarding Airbases

Air Bases shall be safeguarded by a process of approval of proposed developments to:

- Protect the blocks of air through which aircraft fly, by preventing penetration of surfaces created to identify their lower limits.
- Avoid any increase in the risk to aircraft of a bird strike by preventing an increase in hazardous bird species in the vicinity of the airfield and, whenever the opportunity arises, to reduce the level of risk.
- Protect the integrity of radar and other electronic aids to air navigation, by preventing reflections and diffractions of the radio signals involved.
- Protect visual aids such as Approach and Runway lighting, by preventing them from being obscured, or preventing the installation of other lights, which could be confused for them.

Environmental Health Issues

MOD in liaison with Physical Planning Departments at the National and County levels shall provide guidelines for:

- Land use and forest cover within the training areas and all its lands.
- Safe disposal of hazardous materials (HazMat) such as Nuclear, Biological and Chemical (NBC).
- Ensuring adequate buffer zones and safety distances.
- Handling and disposal of remains of munitions including regular clean-up of training areas.

5.27 Religious Institutions

Standards and Guidelines

- A minimum of 0.1ha is required to set up a religious facility
- 1 car parking space of 8m² of public floor area for every 10 worshippers
- Should be located within residential neighbourhoods
- Use soundproof materials during the construction of religious institutions.

- Mosques and temples may be located within the central business district to cater for the business community
- The site should cater for religious facilities, open spaces, parking spaces for vehicles and other related uses.
- Adhere to the building lines and setbacks.
- Permitted uses include church houses, social centres, basic schools, playgrounds, open spaces, bookshops and canteens.

Disaster Risk Management and Climate Change Adaptation

Table 50: Disaster Risk Management and Climate Change Adaptation for Social Facilities

SECTOR	DISASTER RISK	MITIGATION/ADAPTATION MEASURES
Educational, health, recreational and public purpose	Fire outbreaks	• Provide fire hydrants at strategic points and fire sensors to be installed where appropriate • Provide adequate and functional fire extinguishers at strategic locations within buildings • Provide accessible fire assembly points • Provide for playgrounds to serve as evacuation centres • Conduct regular drills to promote timely and efficient responses to disasters • Provide adequate circulation spaces between activity points for ease of movement in case of fire • Provide adequate signage and directional aids to assist with ease of evacuation • Observe the minimum land requirements. Structures should comply with the National Building Code,2022 • Educational facilities should comply with the Safety Standards Manual,2008
	Road accidents	• Provision of well-designated drop-off and pick-up points • Road safety education programmes • Provide for children traffic parks in towns for learning purposes. • Risk assessments should be conducted regularly to identify potential accident points and remedial actions taken. • Provide adequate traffic calming measures such as footbridges, and underpasses at appropriate locations • Avoid direct access to major roads and highways

SECTOR	DISASTER RISK	MITIGATION/ADAPTATION MEASURES
		• Provide school crossing patrollers to assist school-going kids in crossing roads. • Educational facilities should adhere to School Transportation Safety Guidelines • Acceleration and deceleration lanes should be provided
	Terrorism	• Provide for alarms and visual detection systems • Provide CCTV cameras to monitor persons moving into the facilities • Provide adequate security to facilities which are highly susceptible to terror attacks • Provide perimeter fencing for restricted access • Building plan designs for major public facilities should be shared with security personnel • Provide for adequate emergency exits in buildings • Structures should comply with the National Building Code, 2022
	Crime	• Map out crime hot spots and propose mitigation measures. • Provide for adequate security installations at strategic points • Incorporate safety considerations in the planning, design and development of the facilities.
	Natural calamities (Landslides, Earthquakes ,lightning, floods and drought)	• Map out disaster-prone areas and propose mitigation measures. • Restrict developments in disaster-prone areas • Conduct Environmental Impact Assessments and periodic Environmental Audits • Proper design of road networks in steep areas • Locate facilities in suitable sites away from flood-prone areas • Discourage the construction of buildings in an area with a gradient of more than 30 degrees. • Provide lightning arrestors in all buildings • Afforestation and reforestation programmes • Undertake greening.
	Pollution i.e., noise, air, water, land	• Proper waste disposal and management • Development of a waste management plan • Landscaping and greening the facilities. They serve as passive buffers for noise

SECTOR	DISASTER RISK	MITIGATION/ADAPTATION MEASURES
		• Conducting Environmental Impact Assessments and periodic Environmental Audits • Prohibit the location of these facilities in environmentally sensitive areas • Encourage compatible land uses

Source: Physical planning team; 2022

5.28 Tourism & Wildlife

The section aims at buffering, preventing contamination and environmental protection and conservation in these areas.

General Standards and Guidelines

- Map tourism potential areas
- Prepare a local physical and land plan to link the tourism facilities and the tourism attraction sites.
- Designate space for ancillary facilities such as hotels and lodges
- Retain significant views associated with tourist attraction sites.
- Delineate and map historic and cultural site boundaries and setbacks for gazettement.
- Provide water, electricity, drainage systems, waste disposal, telecommunication and parking space.
- Develop tourist stopovers on the tourist circuits where there are points of tourist interest that offer minor tourist facilities such as restaurants, snack bars, shops and toilets. Some isolated stopovers may include small-scale accommodation

Coastal Reserves

Coastal land and water areas are set aside to be maintained in their natural state for research, education and compatible recreation and enjoyment of natural and scenic beauty.

Standards and Guidelines

- Provide a 300 m wide buffer for a coastal forest zone
- Provide a minimum 60m wide buffer for a mangrove forest and turtle sanctuary zone.
- Prohibit developments that pollute or block the natural water flow or movement in the coastal boundary development zone.

- Prohibit developments that disrupt the marine ecosystem and pollute water quality in the open coast zones.
- Permit developments that do not degrade the environment such as research, forest recreation and observation in the eco-tourism zone.
- Permit research, conservation of wildlife and recreation in the mangrove forest and turtle sanctuary zones.
- Encourage the planting of appropriate local tree species
- Require EIA and EA on proposed and ongoing projects for harbour and ports.
- Prohibit storey building at the sea front but 2-storey buildings can be allowed in the second row.
- Control ribbon development at the seafront by alternating developments with parks
- Provide public access at intervals of 0.5 km.
- Maintain and enhance existing views along the beach roads
- Provide appropriate waste management and sanitation facilities in beaches

National parks and game reserves

- Provide a 5 km buffer zone around national parks to limit intensive land use activities around parks and for potential park extension.
- Designate compatible land uses around national parks and game reserves.
- Locate water points near existing natural pans and river beds

Table 51 : Standards and Guidelines for Tourism and Wildlife

Types of tourist attraction sites	**Zones**	**Standards and Guidelines**
Coastal Reserve (Coastal land and water areas set aside to be maintained in their natural state for research, education and compatible recreation and enjoyment of natural and scenic beauty)	Coastal forest zone	•
	Marine Tourism	• Restrict development to only allow for those that do not pollute the environment. • Delineate a riparian reserve of 300m from the highest watermark and all construction should be kept behind the reserve • Provide unlimited access to the beach by the general public • Provide proper signage to guide access to the beaches. • Restrict development around coastal resources including coastal strand vegetation, sand dunes and anchialine pools. • Designate deltas and estuaries as conservation areas during plan preparation.

Types of tourist attraction sites	Zones	Standards and Guidelines
		• Prohibit the construction of sea walls along the shoreline and demolish the ones already constructed. • Designate space for search and rescue facilities.
Areas of significant bio-diversity		• Provide a 50 m buffer zone around national parks. • Protect animal sanctuaries and wildlife breeding grounds from encroachment.
	Wildlife Corridors	• Provide a wildlife corridor of 5 km. • Maintain as much natural open space as possible next to any culverts to encourage the use of the culverts. • Designate land uses that have minimal impacts around wildlife corridors and game reserves.
	Agro-tourism: forest	• Provide a 50m buffer zone for forest reserves. • Permit only environmentally friendly uses.
	Hilltops, Mountains, Hillsides	• Protect hills, mountains and forests through identification, mapping, easement and gazettement • Plant appropriate species of trees. • Zone and protect water catchment areas in hilltops, hillsides, mountains and forests. • Conduct EIA and EA on projects conducted on hilltops, hillsides, mountains and forests. • Protect indigenous forests on hilltops, hillsides, and mountains. • Establish disaster preparedness in forest fires and landslides, mudflows, rock falls, flush floods, volcanic activities, diseases and pests among others.
	Historic and cultural tourism	• Determine appropriate preservation methods. • Provide access to historic and cultural sites.
	Waterfronts	• Plant appropriate trees • Prohibit the following activities: sand mining, animal husbandry, garages/ fitting/ mechanical workshops, large-scale commercial activities/markets, raw solid and liquid waste disposal, cemeteries/crematorium; any heavy or large-scale industry, shipbuilding, coal or oil-fired power stations, or large-scale commercial or military harbors or docks.
	Tourism Potential Areas	• Provide a buffer zone of 3km. • Provide outdoor furniture, solid waste management and sanitation within these sites. • Provide roads for access to these tourist sites.

Types of tourist attraction sites	Zones	Standards and Guidelines
		• Designate land for ancillary uses such as hotels and lodges. • Conduct an EIA for tourism sites. • Provide recommended buffers for lake, river, swamp and parks buffers and roads in line with the provisions of this handbook. • A minimum hotel density of 100 hotel rooms per hectare is recommended • Provide adequate parking in line with the standards and guidelines in this handbook

Source: Physical planning team; 2022

Disaster Risk Management and Climate Change Adaptation

Table 52: Disaster Risk Management and Climate Change Adaptation for Tourism and Wildlife

Risk	Mitigation
Accidents e.g. drowning, fires, injuries	• Map out accident-prone areas. • Designate sites for facilities such as hospitals, firefighting stations, search and rescue facilities within and around tourist sites • Encourage sensitization to advise residents, tourism operators, business owners and visitors about hazards, hazardous areas and risk reduction measures.
Crime	• Designate sites for security installations and institutions en route and around tourist sites.
Extreme weather conditions e.g. drought, floods	• Preserve and restore environmentally sensitive areas e.g. flood plains, wetlands, and coastal dunes. • Encourage the use of climate-proofed structures to better withstand hazard events.
Loss of biodiversity	• Require EIA and EA on proposed and existing projects. • Identify, map and protect indigenous forests on hilltops, hillsides, and mountains. • Integrate ecosystem management planning in preparation of local physical and land use plans. • Encourage the implementation of the Oil Spill Contingency Plan. • Encourage the development and implementation of early warning systems for disaster management (e.g., for tsunami phenomenon) and sensitize the local communities on disaster preparedness and response. • Encourage mangrove planting for rehabilitation of degraded coastal areas and afforestation for the benefit of the community.
Pollution	• Encourage enforcement of the polluter pays principle. • Promote sound waste management practices

Source: Physical planning team; 2022

5.29 Human Settlements

A human settlement is the totality of the human community - whether city, town or village - with all the social, material, organizational, spiritual, cultural and physical elements that sustain it. They are categorized as urban and rural.

Standards and Guidelines

- Develop and enforce county physical and land use plans
- Provide:
    - Designated locations for establishment of public utilities and social amenities taking into consideration the interrelationships between various land use types.
    - A minimum 9m access road to every residential plot
    - Access to emergency services and public transport within 500M from every plot.
- Encourage;
    - NMT oriented settlements
    - Promotion of urban-rural linkages
    - Balanced development through relocation of administrative services from major urban centres and the dispersal of urban centres in remote areas
- Promote adequate and functional open spaces in settlements to enhance circulation, liveability and aesthetics.
- Prohibit settlements and development in protected areas, reserves and way leaves.

5.29.1 Urban Settlements

Classification of urban settlements has been done according to population and facilities provided as shown in Table 53 below:

Table 53: Classification of urban areas based on resident population and recommended services

CITY	MUNICIPALITY	TOWN	MARKET CENTRE
Population; at least 250,000	**Population; at least 50,000**	**Population; at least 10,000**	**Population; at least 2,000**
• Street Lighting • Heath Facilities including Level 6l • Sports and Cultural Activities (Stadia, Theatre, Museums, Cultural Centers)	• Street Lighting • Heath Facilities including Level 5 hospital • Sports and Cultural Activities (Stadium, Theatre, Museums, cultural centers)	• Street Lighting • Health Facilities • Sports and Cultural centres (Stadium) • Community Centres • Abattoirs • Piped water and sewerage,	• Street Lighting • Health Facilities • Sports and Cultural centres/facilities (Playgrounds) • Community Centres • Abattoirs/Slaughterhouse

CITY	MUNICIPALITY	TOWN	MARKET CENTRE
• Community Centres • Abattoirs • Piped water, sewerage, sewerage treatment plant • Storm Drainage • Solid waste management • Child Care Facilities • Pre-Primary Education • University, polytechnics, national school • Public Transport • Local Distributor Roads • Recreational parks and theme parks • Markets • Administrative units • Cemeteries and Crematoria • Funeral parlour • Library services • Pollution (Air, water, soil) control • Information, Communication and Technology services • Planning and Development control • Traffic Control and Parking • Outdoor Advertising • Ambulance Services	• Community Centres • Abattoirs • Piped water, sewerage, sewerage treatment plant • Storm Drainage • Solid waste management • Child Care Facilities • Pre-Primary Education • Constituent University Campuses, Polytechnic County schools • Public Transport • Local Distributor Roads • Recreational parks • Markets • Administrative units • Cemeteries and Crematoria • Funeral parlour • Libraries • Pollution (Air, water, soil) control • Information, Communication and Technology services • Planning and Development Control • Traffic Control and Parking • Water and Sanitation • Storm Drainage • Outdoor Advertising • Ambulance Services • Fire Fighting and Disaster Management • Electricity and Energy provision • Airstrip	Decentralized Transfer Facility(DTF) • Storm Drainage • Solid waste management • Child Care Facilities • High school, Primary Schools and Pre-primary • Vocational Institution • Bus Park • Road networks, streets, walkways, sideways and cycleways • Recreational park • Markets • Administrative units • Cemeteries and Crematoria • Funeral parlour • Library Services • Pollution control • Telecommunication services •	• Community water points, septic tanks and VIP toilets • Storm drainage • Refuse Collection Points • Solid waste management • Child Care Facilities • Primary and pre-primary schools • Vocational Institution • Bus Park • Road network/streets/ • Walkways/sideways/cycleways • Recreational parks • Markets • Administrative units • Animal control and welfare

CITY	MUNICIPALITY	TOWN	MARKET CENTRE
• Fire Fighting and Disaster Management • Electricity and energy provision • Airport and airstrip			

Source: Urban Areas and Cities (Amendment) Act, 2019

Standards and Guidelines

- Locate urban centres in areas with low agricultural potential. Observe the following standards when allocating land use;

Table 54: Land use allocation within a market centre

N0.	USER	LAND ALLOCATION %
1	Commercial	5-10
2	Residential	35-50
3	Industrial	7-10
4	Recreational/Open spaces	4-8
5	Agriculture	NB
6	Institutional (Education)	3-6
7	Infrastructure	10-20

Source: Physical planning team; 2022

NOTE. *Reasonable variations may be permitted depending on local conditions*

- Encourage vertical developments in urban settlements as opposed to horizontal to optimize on space.
- Provide affordable housing and social housing to minimize the proliferation of informal settlements.
- Provide purpose-built housing for groups with special needs, such as the elderly and the disabled.

- Provide buffer zones between residential and non-compatible land uses such as industries
- Encourage attractive urban design, landscaping, and tree planting to enhance the aesthetics of urban areas

Informal Settlements

An unplanned residential area where a group of housing units have been constructed on land to which the occupants often have no legal claim.

Standards and Guidelines

- Create an inventory of all existing informal settlements and undertake detailed mapping and planning of to facilitate gradual improvement.
- Provide a 6M footpath to every plot
- Provide secondary and local distributor roads, and access roads within 500 m.
- Provide adequate support infrastructure such as roads, water, sewerage system, and stormwater drainage, among others.
- Designate and develop 2m firebreaks after every 100m.
- Provide urban open spaces (parks, playgrounds or natural open spaces)
- Provide potable water points at a distance of 250 m for a population of 2000 inhabitants.
- Provide ablution blocks(toilets and bathrooms) at designated areas
- Restrict open wiring and encourage underground placement of cables for purposes of safety.
- Provide closed sewers for safety purposes
- Construct integrated solid waste facilities to enable collection, treatment and disposal of solid waste
- Encouraging mixed development to alleviate the wastage of land in informal settlements
- Encouraging the pooling of land and redevelopment into high-rise houses
- Encourage the provision of incentives to squatters to buy the land they occupy at subsidized rates (land regularization)

Urban Renewal/ Regeneration

Urban renewal is the process of upgrading and redeveloping decayed areas in cities.

Standards and Guidelines

- Rationalize land uses within the concerned urban areas
- Prepare urban renewal and redevelopment plans for degraded urban areas.

- Preserve as far as practicable local characteristics and the social networks of the local community.
- Preserve buildings, sites and structures of historical, cultural or architectural value
- Provide open spaces and community centres.
- Undertake road widening/redesigning programs to ease and discourage traffic congestion and encourage pedestrian and non-motorized transport.
- Redevelop dilapidated buildings into modern high-rise buildings and environmentally friendly design to save on available space.
- Locate medium to high levels of densification near places of employment, social services and community facilities.
- Encourage the use of efficient management systems in redeveloped buildings to enhance efficiency.
- Upgrade existing infrastructure such as water and sanitation among others.

5.29.2 Rural Settlements

A group of houses in the countryside, which can take the form of a dispersed settlement, a hamlet, or a village

Standards and Guidelines

- Encourage planning for public settlement schemes and communal land to ensure adequate provision of services.
- Restrict homesteads to 25% of the total land size of the individual parcel
- Provide infrastructure such as community centres, a common burial site, water, and electricity among others.
- Promote rural character by restricting buildings to 1-2 stories
- Observe a minimum building line of 10 meters
- Provide at least 10% of the land for agroforestry
- Promote compact development to enable the sharing of social amenities and the release of land for agricultural development
- Provide an efficient, reliable and effective transport system by ensuring adequate and quality road networks that integrate Non-Motorized Transport (NMT)
- Provide buffer zones between game parks and settlement zones.

5.29.3 Resettlement

Resettlement is the process of moving displaced people to a different place.

Standards and Guidelines

- Prepare a resettlement policy framework and a resettlement action plan.
- Prepare an environmental and social impact assessment.

- Prepare a livelihood restoration plan.
- Liaise with the National Land Commission in instances of compulsory land acquisition.

5.30 Housing

Housing is the construction and assigned usage of buildings individually or collectively, for shelter. It also includes the development of supporting infrastructure like roads, water, sanitation, and power among others. In planning, housing is defined as a residential user. This section provides guidelines on the development of residential areas. Categorization of the residential areas should be based on development density and level of services (to avoid segregation of people). Residential areas can be categorized into low, medium, high and mixed density.

Planning for residential land use

General Standards and Guidelines

- Prepare physical and land use development plans for all areas to be used for residential use
- Segregate residential zones using roads
- Ensure planned residential plots are rectangular, or close to rectangular, depending on the topography
- Observe the number of floor levels depending on the approved plot ratio of the areas
- Site considerations shall include site layout, topography, open space, location of buildings and access
- Provide;
    - Basic supporting facilities such as corner shops, shopping centre, parking spaces, health facilities, public open spaces, sanitary areas, basic educational facilities, ample supply of water, sewer network, electricity, roads
    - Fire exits, fire extinguishers in buildings and a hydrant within a 90m radius.
    - Underground rainwater harvesting tank for collection of rainwater from the roof
    - Setback lines to ensure the provision of open areas around structures for: visibility and traffic safety, access to and around structures, natural light, ventilation, and space for landscaping
    - Minimum setbacks of 3m for guardhouses, waste storage areas, and all service buildings from the fence line.
- Ensure that all setback areas are open and unobstructed from the ground upward
- Observe civil aviation protection distances for all buildings if the subject site is adjacent to the airstrip

- Ensure fencing does not exceed 2.1M in height to ensure proper circulation of air and aesthetics as per the National Building Code, 2022
- Preserve the natural vegetation and topography to enhance attractiveness and compatibility within the neighbourhood
- Observe development densities as shown in Table 55 below;

Table 55: Standards for Various Housing Densities

Development density	**Typology**	**Minimum plot size (Ha)**	**Maximum Plot coverage**	**Plot ratios**
Low density	Bungalow	0.20	30%	-
	Maisonette			1:3
Medium density	Detached and Semi-detached Bungalow	0.10	50%	-
	Detached and Semi-detached Maisonette			1:3
	Multi-family dwelling			1:4 – 1:6
High density	Multi storey; Flats/Apartment	0.045	70%	1:5-1:8
Mixed density (for comprehensive development)	Multi storey; Flats/Apartment,	0.045	70%	1:5-1:8
	Detached and Semi-detached Bungalow	0.10	50%	-
	Detached and Semi-detached Maisonette	0.10	50%	1:3
	Multi-family dwelling	0.10	50%	1:4 – 1:6

Source: Physical planning team; 2022

Building lines and Setbacks

A building line means a limit beyond which a house must not extend to a street while a setback means the distance between the building and the property boundary. Setbacks in buildings are important for reasons of privacy, amenity, health and safety. They are illustrated in Table 56, Figures 28 and 29 respectively.

Table 56: Minimum setbacks

	Low Density(m)	Medium Density(m)	High Density(m)
Front	6	6	3
Side	3	2	2
Rear	6	4	2

Source: Physical planning team; 2022

- Ensure that the walls of the building are on or behind the specified building lines.

- In high density areas, one of the side building lines of the plot may be reduced to 1m provided there are no main windows on that side
- The minimum building lines may be determined by the road fronting that plot

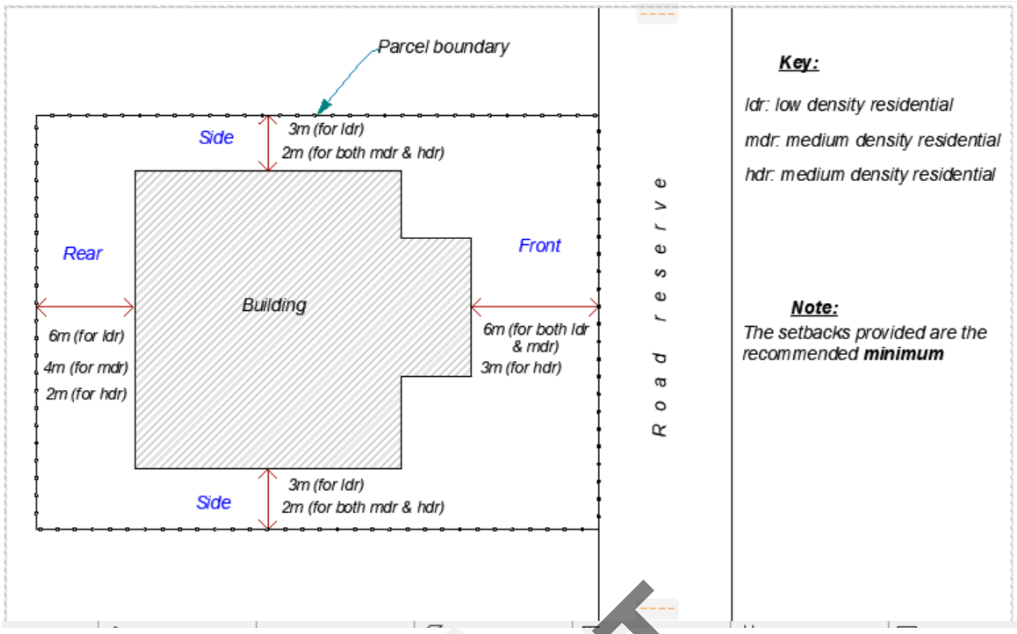

Figure 28: Setbacks for residential developments
Source: Physical Planning team, 2022

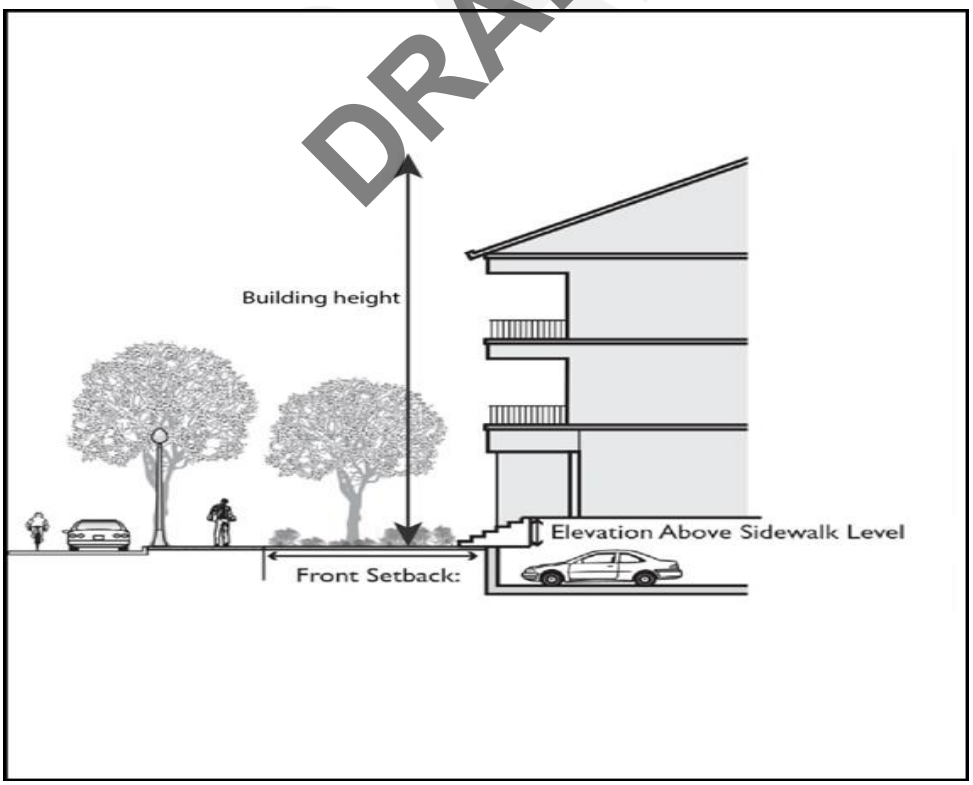

Figure 29: Illustration of a building height
Source: Physical planning team; 2022

Plot access within residential neighbourhoods

- Maintain a road hierarchy by providing adequate access and connectivity through 15M major distributor roads, 12M secondary roads and 9M access roads
- Observe a minimum road size of 12M within high and mixed density.
- Provide NMT lanes on all roads.
- Ensure the length of any cul-de-sac does not exceed 60M
- Provide breaks after every 100m in medium, high and mixed density.
- Every plot must have direct vehicular access to a road

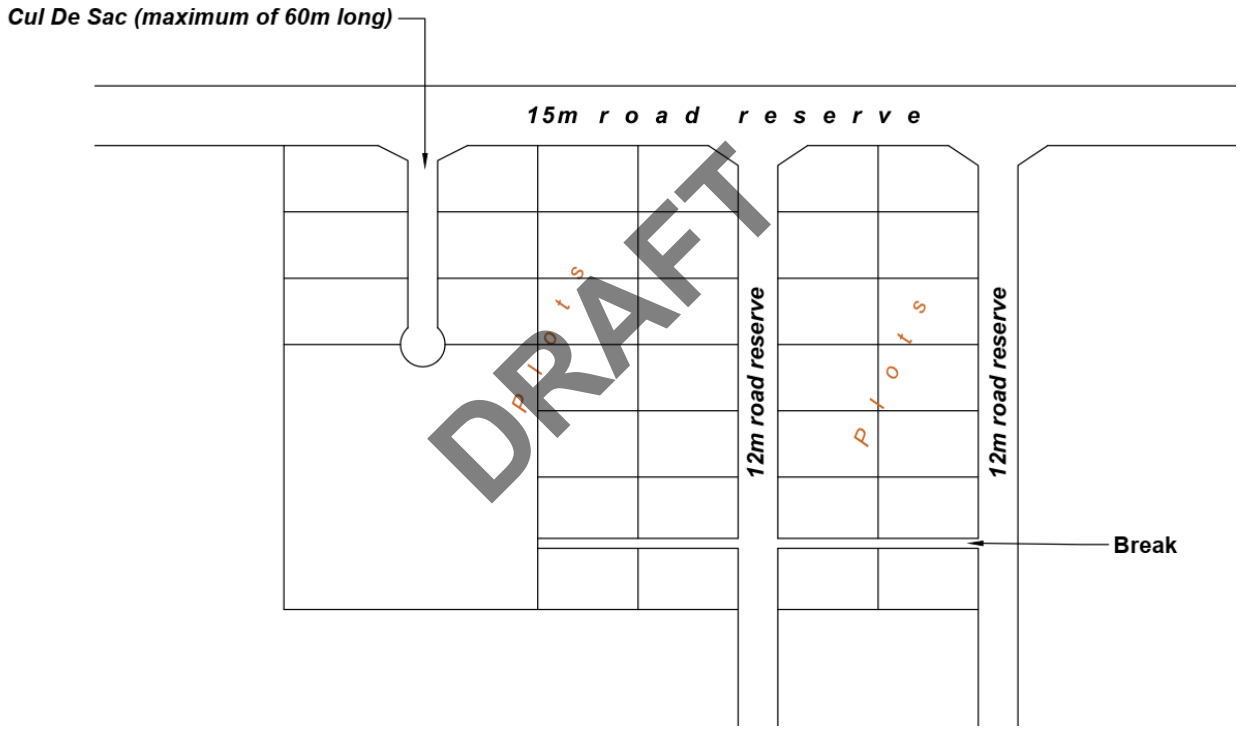

Figure 30: Plot Access in Residential Areas
Source: Physical planning team; 2022

Building Design

- Ensure that all residential developments in urban areas are built with permanent materials to resist penetration of rain and passage of moisture from the ground to the inner surface
- Ensure that all residential buildings, intended to be separately let for dwelling purposes, shall have a kitchen.

- Ensure that the foundation of all buildings shall have depth that safeguards the building against damage by swelling, shrinking or erosion of the subsoil as per the National Building Code, 2022.

Residential Plot Layout

- Orient structures in relation to the sun and prevailing winds.
- Ensure that plot layouts respect the physical configuration of the site, and placement of houses follows natural contours.
- Locate service areas including waste collection points and storage away from public view, through planting hedges.
- Position and design detached developments like servants' quarters and guesthouses in a manner that ensures privacy to the main house occupants.

Parking

- Provide adequate parking on all residential plots
- Observe minimum parking requirements as follows;
    - Low density- 2 parking spaces
    - Medium density – 1 Parking space
    - High density – Ratio of parking spaces to housing units (1:3)
- Provide a 3-meter private driveway leading to the house in low and medium-density residential developments
- Encourage public car parks within residential neighbourhoods

Utilities

- Provide
    - adequate water supply and drainage channels for surface water runoff,
    - waste collection points equipped with containers within neighbourhoods.
    - adequate septic tanks and ventilated improved pit latrines (VIP) in areas not connected to trunk sewer
    - electricity supply and internet in all habitable buildings
- Permit the use of generators, solar and wind systems in residences
- Enclose plots with live fences (hedges), wire fences and perimeter walls.

5.30.1 Gated Communities

A gated community is a residential neighbourhood with controlled access using one or more gates.

Standards and Guidelines

- Prepare a comprehensive local physical and land use development plan for the gated neighbourhood
- The minimum land requirements for gated communities shall be as follows;

Table 57: Minimum Land Requirements for Gated Communities

Building type	**Max Ground Coverage**	**Height (No. of storey)**	**Density (Dwelling units/ hectare)**
Single dweller (Low Density)	40%	G+1	30
Row Housing (Medium Density)	50%	G+4	60
Multiple building lots (high density)	60%	Max: G +5 Min: G+3	200

Source: Physical planning team; 2022

NOTE: The no of storeys is subject to prevailing zoning regulations for the area

- Observe a minimum separation distance of 10M wide between buildings to enhance movement, lighting, ventilation etc
- Allow an outbuilding no larger than 6% of the plot's area for single-dweller residential units
- Ensure that dead-end streets do not exceed 90M in length and have a turning radius of at least 15M hammerhead.
- Discourage cul-de-sacs in slopes of more than 10 degrees to avoid drainage challenges
- Separate any two adjacent driveways on neighbouring plots by at least 1.5m of soft landscaping
- Allow support facilities of a scale that does not attract the general public

5.30.2 Mixed Housing

Mixed housing is a residential development containing tenants of different incomes such as low, middle and high income. Mixed housing aims to reduce social segregation in residential neighbourhoods.

Standards and Guidelines

- Prepare Local Physical Development Plans with standard plot sizes to accommodate low, medium and high-density buildings within blocks
- Prepare Action Plans to guide development for properties larger than one hectare

- Observe flexibility by promoting various housing typologies; single units, semi-detached, row houses, and apartment

5.30.3 Sectional Properties

Sectional properties are spaces divided into individual units to be owned by individual proprietors and the common property owned by the proprietors of the units as tenants in common.

Standards and Guidelines

- Observe a minimum plot size of 0.4 ha inclusive of parking, access, solid waste collection cubicles, and playground.
- Ensure plot coverage conforms to zoning regulations requirements for the area.
- Observe a minimum separation distance of 10M wide between buildings to enhance movement, lighting, ventilation, etc.
- Ensure developments of more than one building are complementary to each other in terms of form and scale.
- Provide ;
    - adequate spaces for circulation within buildings.
    - leisure facilities for the members e.g. clubhouses, gym etc.
    - adequate parking
    - a lift on the property as per the Building Code 2022
- Promote the use of varied building heights, building articulation, landscaping, walls and fences, to reduce building mass impacts.
- Consider circulation, colours, building materials, lighting and signage to enhance a desirable environment, in compatibility with adjacent surrounding uses
- Establish safe, direct and convenient access to common amenity areas e.g. playgrounds.

Disaster Risk Management and Climate Change Adaptation

Table 58: Disaster Risk Management and Climate Change Adaptation for Human Settlements

Disaster Risk	Mitigation
Fire	• Prepare detailed site plans for the buildings and mount them on strategic locations. • Designate and develop fire breaks in neighbourhoods • Provide adequate access roads for the movement of fire engines • Designate sites for the erection of fire stations and fire hydrants in all urban areas • Encourage automatic smoke sensors in high-capacity buildings

Disaster Risk	Mitigation
	● Maintain separation distances between buildings to allow evacuation in case of fire ● Provide well-accessible fire hydrants and firefighting equipment in buildings ● Ensure clear labeling and operational emergency exit routes in buildings. ● Encourage regular inspections of the buildings to confirm fire safety preparedness
Flooding	● Identify, map, and discourage human settlement in flood-prone areas. ● Create a buffer zone between the floodplain and human settlement ● Undertake an Environment Impact Assessment (EIA) for all proposed developments ● Encourage terraced levels for buildings along the slopes in response to the topography
Landslides	● Identify, map and discourage human settlement in landslide-prone areas ● Encourage intensive soil and water conservation measures in already-settled landslide-prone areas ● Consider slope, soil characteristics and vegetation cover when siting infrastructure in landslide-prone areas
Earthquakes and geologically active areas	● Identify, map and discourage settlements in prone areas ● Discourage development in areas of more than 20% slope ● Encourage use of appropriate designs of houses in earthquake-prone areas ● Require EIA for proposed developments
Noise	● Prohibit the location of residential areas in noise-prone zones ● Create buffers to separate incompatible users ● Ensure adherence to the provisions of the Noise and Excessive Vibrations in EMCA 2009 Regulations.
Insecurity	● Designate sites for the erection of administrative structures ● Avoid invisible corners such as 90 degrees corners in designing plot boundaries along roads ● Expand narrow roads and prohibit illegal erections on road reserves ● Adopt neighbourhood design to create defensible spaces ● Encourage the provision of street lights along primary and secondary distributor roads ● Encourage street maintenance such as clearing bushes along road reserves
Collapse of buildings	● Require submission of building plans to relevant authorities for approval ● Ensure adherence to the provisions of the National Building Code, 2022

Disaster Risk	Mitigation
	• Encourage adequate suitability analysis before development e.g. geology and soil analysis
Displacement of people	• Designate, accessible and serviced areas for resettlement. • Prepare and implement resettlement action plans. • Require an Environmental Social and Economic Assessment
Pandemics	• Plan all human settlements • Designate green spaces within the plan • Ensure provision of adequate physical infrastructure in settlements (water and sanitation, refuse collection, health etc.) • Identify and provide sites for emergency response
Urban sprawl	• Define urban growth limits and create buffers within those areas • Plan for towns in strategic locations to achieve balanced regional development • Promote compact development • Ensure adherence to zoning regulations

Source: Physical planning team; 2022

5.31 Commercial Developments

General Standards and Guidelines

- Allocate 5-10% of the total urban area to commercial use
- Observe a minimum plot size of 0.045 Ha
- Observe a maximum plot coverage of 80% to allow for verandas and pedestrian walkways.
- Locate in the CBD and the commercial nodes designated as commercial user
- Locate the tall buildings either at the center or around an open space in the center of the CBD
- Integrate the commercial developments with open squares at designated places throughout the area, interconnected with walkways to act as recreation and carbon sinks
- Observe a minimum street width of 15m to cater for vehicular and pedestrian traffic and laying out of other infrastructure, such as water, sewer, stormwater drains, electricity, fibre optic cables among others.
- Observe building lines of 6m where roads range between 9-18 meters wide and 18 m for any roads above 18m.
- Ensure that all infrastructure facilities and services are laid underground to optimize the use of space
- Provide 18-25m local roads to link the minor distributors
- Prohibit direct access to buildings/plots within the CBD by loop streets and service lanes.

- Discourage cul-de-sacs within commercial areas
- Provide a 6m service lane for all commercial plots
- Provide a minimum of 3m wide cycle lanes and 2m wide pedestrian footpaths
- Provide a minimum of 5% green cover
- Provide on-site parking
- Provide one parking space for every 40m2 gross floor area. However, observe the following standards;
    - Banks – 1 space per 25 m^2 of gross floor area
    - Shopping centre - 4 spaces per 100 m^2 of gross floor area
    - Roadside stalls – A minimum of 4 spaces
    - Markets – 1 space for every 2 stalls
- Rear yards may be enclosed with walls not exceeding 2.1m in height
- Main access can be on the front while the rear access provides for loading and off-loading.

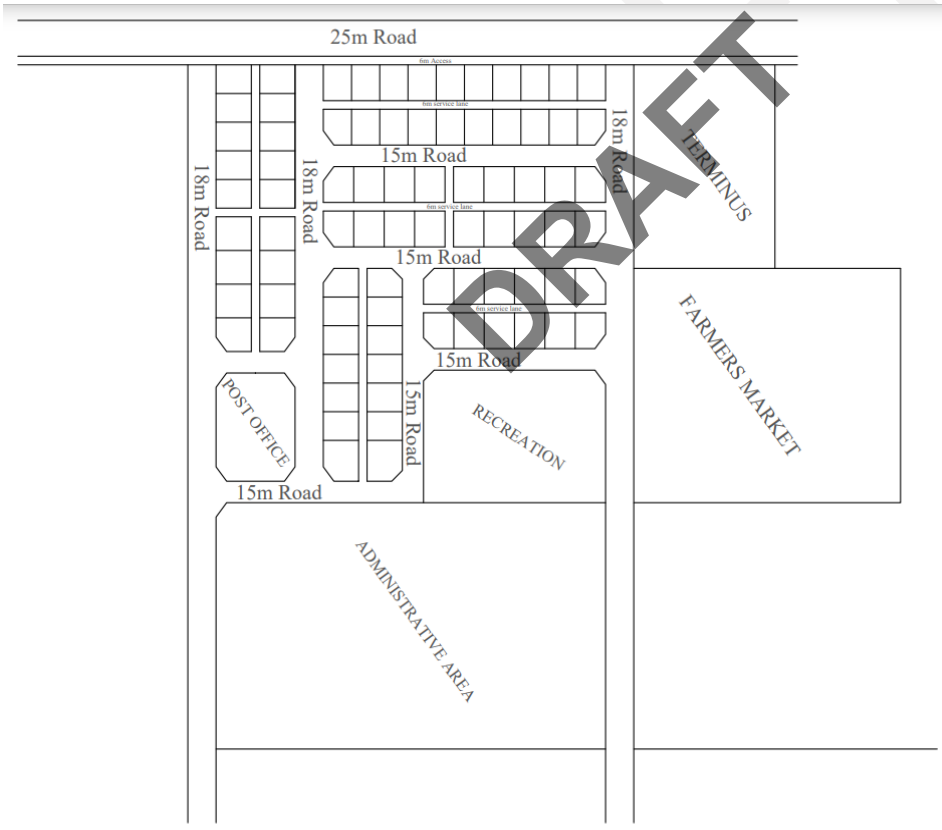

Figure 31: Road Hierarchy in Commercial Areas
Source: Physical planning team; 2022

5.31.1 Cities, municipalities and towns

- Locate the tall buildings either at the center or around an open space in the center of the CBD at a plot ratio of 600% which could vary within the CBD depending on the designated blocks. As you proceed from the center the plot ratio can decrease by intervals of 150% from 600% to 450%, 300% and 150% depending on the desired townscape.
- Channel all external through traffic to and from the CBD to a 60m wide bypass.
- Provide setbacks and building lines based on the size of the fronting road

5.31.2 Market Centre

Market centres provide lower-order goods for the surrounding population. These centres are complementary to the major towns and do not undermine the higher-order functions of those towns

5.31.3 Neighbourhood Shopping Centre

Neighbourhood centres satisfy the daily needs and conveniences of the surrounding population. These centres are complementary to the market centers.

Standards and Guidelines

- Catchment population of up to 15,000 persons
- Locate in close proximity to other neighbourhood facilities such as health facilities
- Observe a minimum plot size of 3 ha
- Provide;
    - 15m access road and encourage Non-Motorized Transport
    - Vertical separation of vehicles and pedestrians by constructing pedestrian walkways at different levels
    - 0.2 ha for parking
    - Basic facilities including electricity, water, sanitary area and refuse disposal site

5.31.4 Local shops

A local shop is a commercial building selling convenience goods in retail and operates beyond normal trading hours. It serves a few households.

Standards and Guidelines

- Catchment population of up to 100 persons
- Observe a minimum plot size of 0.045ha
- Locate along major pedestrian routes
- Ensure it does not obstruct the free flow of vehicular and pedestrian traffic
- Provide adequate access and other support amenities such as water and electricity.

5.31.5 Markets

A market is a place where the exchange of goods and services takes place. They can either be open-air or closed and can be regular or periodic.

Standards and Guidelines

The following table provides the categorization of markets and their respective standards.

Table 59: Standards and Guidelines for Markets

Market Category	Characteristics	Standards
A- Local	• Limited to the local region or area • Targets low-income groups in suburban areas • Usually sell perishable goods for daily use • Hours of operation are limited	• Provide a land size of 0.1-0.2 ha • Provide central waste collection points, central water points and ablution blocks • Provide fixed stalls and hard-standing surfaces
B- Open-air market	• An outdoor market where local traders sell their merchandise e.g Kibuye Market in Kisumu • Operation of the market can be periodic or daily. • They have designated areas for the sale of specific goods	• Observe a minimum land size of 0.3 ha • Provide central waste collection points, central water points, ablution blocks and public bathrooms • Provide adequate pedestrian access • Provide fixed stalls and hard-standing surfaces • Designate common entry/exit points • Provide parking as provided in Table 19 • Designate a fire assembly point
C- Covered markets	• Characterized by permanent stalls and shops in a built structure. E.g Economic stimulus markets • They have designated areas for the sale of specific goods	• Observe a minimum land size of 0.3 ha • Provide central waste collection points, central water points, ablution blocks and public bathrooms • Provide adequate pedestrian access • Provide fixed stalls and hard-standing surfaces • Designate common entry/exit points • Encourage vertical development • Provide parking as provided in Table 19 • Provide fire assembly points

Source: Physical planning team; 2022

5.31.6 Shopping Malls

A large retail complex containing a variety of stores, restaurants and other business establishments. These may be housed in a series of connected or adjacent buildings or in a single large building.

Standards and Guidelines

Land Requirements

- Observe a minimum plot size of 2 ha
- Maintain a plot ratio of 1:3

Location

- Locate in;
    - Areas with a minimum access road of 15m to major roads
    - Proximity to public transport
    - Proximity to residential areas.

Site design, access and connectivity

- Promote an integrated theme that ties the entire development as a unified whole.
- Cluster buildings in relation to the interconnecting quality of landscaping, open space and pedestrian areas
- Provide;
    - On-site vehicular and pedestrian circulation routes including accelerating and decelerating lanes
    - Clearly delineated crosswalks where pedestrian circulation routes cross vehicular traffic aisles and driveways
    - Site entrance and exit that are designed to ensure safety, efficiency, and functionality while providing a quality user experience
    - Adequate public restrooms, lactation and baby changing rooms and steps and ramps across retaining walls and slopes
- Integrate drive-thru lanes with the overall site layout to provide safe, efficient and integrated vehicular/ pedestrian circulation
- Coordinate on-site transit routes with public transit facilities
- Integrated drop-off zones into the design with attractive paving, adequate separation of vehicles and pedestrians, and convenient location near building entrances.
- Integrate separate freestanding sites (pad developments) in parking lot layouts
- Locate seating areas and benches in shaded areas that are close to site facilities but will not otherwise block or cause congestion along circulation routes
- Designate emergency exits, fire assembly points
- Observe ten (10)percent greening
- Ensure compatibility with the surrounding areas in terms of materials, colours and design details

Parking

- Encourage storeyed parking buildings
- Locate parking close to building entrances, ensure that it is easily identifiable and separate from pedestrian circulation areas
- Provide on-site directional signs to direct motorized vehicles to appropriate parking
- Encourage covered areas that provide shade and protection from extreme weather conditions

Traffic Calming

- Integrate traffic calming measures into the transportation and site layout strategy.
- Encourage the use of traffic calming techniques such as wide speed humps, raised crosswalks and raised intersections to enhance safety.

Lighting

- Encourage a combination of attractively designed and located lighting fixtures, including low pole lights, ground-mounted fixtures, light bollards and architectural lighting to provide interesting compositions, as well as a safe, secure environment.

Public Open Spaces

- Locate in proximity to areas of activity, such as primary circulation routes and building entrances.
- Encourage courtyards to provide effective intermediary gathering points and serve as an organizing element for multiple pedestrian circulation routes

5.31.7 Disaster Risk Management and Climate Change Adaptation

Table 60: Disaster Risk Management and Climate Change Adaptation for Commercial Developments

Disaster Risk	Mitigation
Terrorism	• Provision of emergency exit routes • Require submission of architectural drawings to the ministry responsible for disaster risk management. • Encourage the provision of alarms and visual detection systems e.g. CCTV cameras • Encourage terrorism preparedness drills
Fire outbreaks	• Designate spaces for a firefighting training college • Provision of fire hydrants and fire sensors, fire assembly points and fire breaks at strategic locations • Provide adequate road widths for ease of access by fire tenders • Encourage regular fire inspections and drills • Observe siting building spaces as per the national building code

Disaster Risk	Mitigation
Flooding	• Map flood-prone areas • Align development with natural terrain and contours • Protect by prohibiting the location of commercial developments in environmentally sensitive areas • Require Environmental Impact Assessments. • Provide: o buffers between floodplains and commercial establishments o adequate and functional stormwater draining o green spaces and greening o sustainable urban drainage systems such as green roofs, water storage tanks, soakaways, attenuation tanks, green spaces, permeable paving, among others • Encourage: o green building by integrating roof water harvesting, and solar heating among others in the design o regular drainage maintenance, conducting community sensitizations and environmental cleaning day o use of closed stormwater drains
Pandemics	• Designate control zones and routes for rapid emergency response and containment • Provide NMT and greening along all roads • Integrate building with open spaces (pandemic breaks) • Observe the provisions of OSHA and the National Building Code on circulation spaces
Structural failures	• Observe the provisions of the National Building Code • Require EIA and EA of buildings • Encourage regular structural integrity inspections and tests
Pollution (noise, air, water, land)	• Forward planning of up to 50 years for urban settlements • Prepare urban sustainable mobility plans (mass transit, NMT, BRT) and integrate with vehicle-free days • Adherence to zoning regulations • Observe NEMA regulations on pollution • Encourage the preparation of waste management plans • Encourage incentives such as carbon credit, REDD+, and Payment for Ecosystem Service (PES)
Road accidents	• Provide at-grade crossings and integrate them with traffic calming measures (bumps, bollards, traffic lights among others) • Provide designated drop-off and pick-up points • Prohibit pedestrian access to major roads and highways • Provide complete NMT routes • Encourage regular risk assessments and mapping of accident-prone areas • Encourage compliance with traffic limits • Encourage sensitization on road safety awareness
Urban Heat Island	• Designate sites for green open spaces

Disaster Risk	Mitigation
	• Observe a minimum road size of 15m • Provide for Non-Motorized infrastructure • Encourage form-based zoning (anticipated zones for the development of green buildings) • Encourage green buildings such as rooftop gardens, and vertical green walls among others • Encourage tree planting along transport corridors

Source: Physical planning team; 2022

5.32 New Paradigms in Urban Development

New paradigms in urban development such as Techno, Smart, Metropolis and Megacities and Resort cities have emerged. These new approaches are unique in design, function, efficiency and sustainability. These cities are a response to the evolving economic, social and environmental needs and as such, they require innovative standards and approaches to their planning and management.

5.32.1 Smart Cities

Smart can be defined as a sustainable city where various city services are provided based on city infrastructure constructed by converging and integrating construction technologies, ICT, etc. to enhance its competitiveness and liveability.

Components of smart cities

A smart city is determined using a set of characteristics, including:

- An infrastructure based on technology
- Environmental protection initiatives
- Effective and highly functional public transportation
- Progressive physical and land use development plans
- People can live and work within the city, using its resources
- Collaborative planning and citizen participation.

Resilient city

The ability of the urban system and its inhabitants to maintain continuity through all shocks and stresses while positively adapting and transforming towards sustainability or as the capacity of the individuals, communities, institutions, businesses and systems within a city to survive, adapt, grow no matter what chronic stress or acute shock it experiences.

Standards and Guidelines

- Prepare bold, confident and progressive city plans.
- Delineate a 10km buffer zone plan around the city to protect its integrity.
- Promote mixed land use, containing a range of compatible activities close to one another to make land use more efficient.
- Incorporate a variety of housing ranges to provide opportunities for all i.e., Housing and inclusiveness
- Plan for a variety of transport options such as Transit Oriented Development (TOD) to ensure there is effective and highly functional public transportation.
- Prepare and incorporate climate resilience, adaptability and responsive measures and mechanisms in plans
- Create walkable localities to; reduce congestion, air pollution and resource depletion, boost the local economy, promote interactions and ensure security.
- Preserve existing and incorporate areas for developing open spaces (such as parks, playgrounds and recreational spaces) to enhance the quality of life of citizens and reduce the urban heat effects
- Propose an institutional framework to spearhead the management and development of the city.
- Ensure self-sufficient cities whose people can live and work within, using its resources.
- Ensure infrastructure development is based on technology.
- Encourage tech-driven innovations in a large scope of applications from mobility to waste management, healthcare, education, and citizen protection among others.
- Ensure optimized energy consumption
- Encourage the provision of secure and transparent infrastructure
- For existing cities, consider city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) plus a Pan-city initiative when upgrading to Smart Cities.

Figure 32 below illustrates various aspects and factors to consider when planning a smart city.

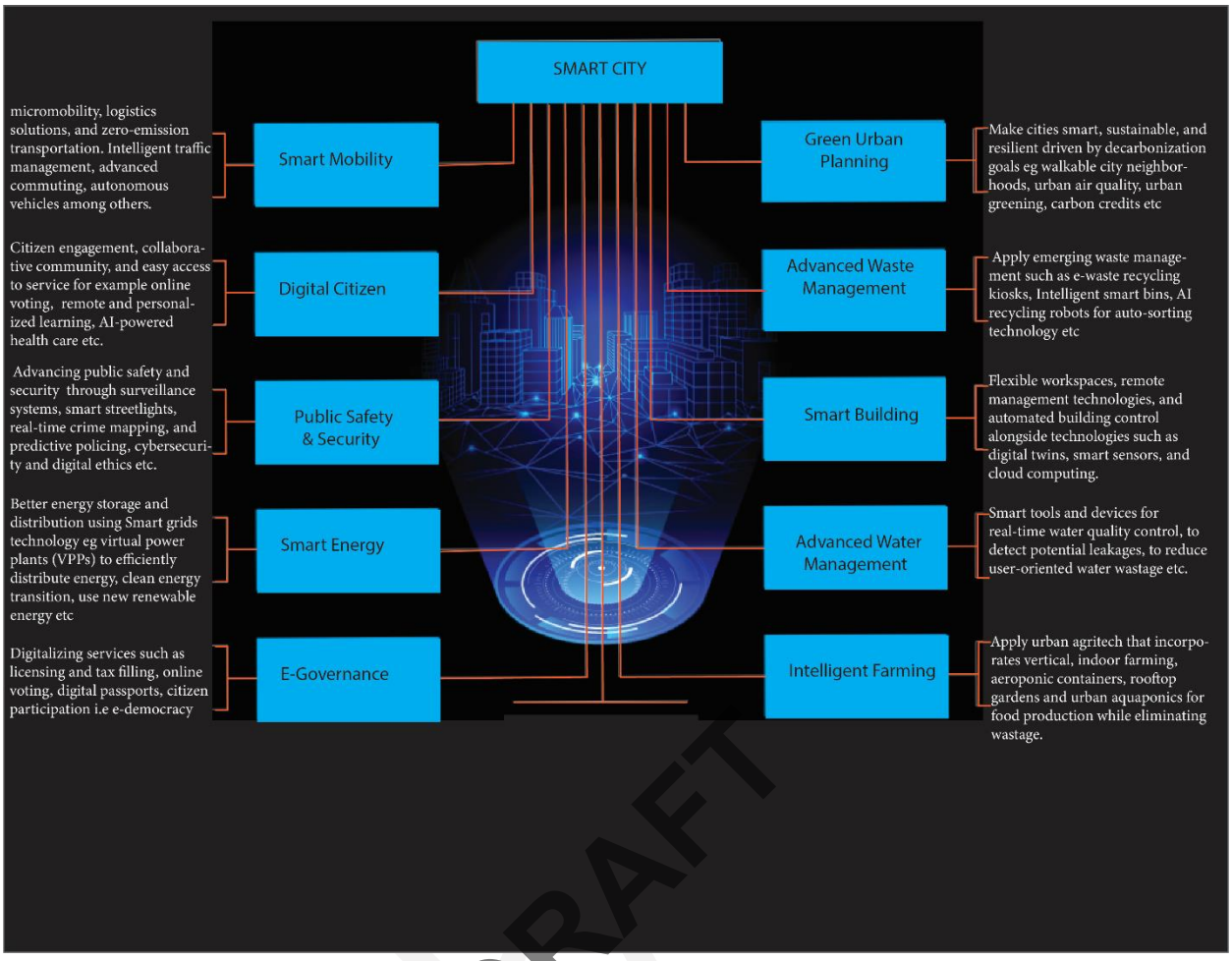

Figure 32: Characteristics of a smart city
Source: Physical planning team; 2022

5.32.2 Techno City (Technopolis) Planning

A Techno city or technopolis is a sustainable, world-class technology hub that connects human capital, social capital and ICT infrastructure in order to address public issues, achieve sustainable development and increase the quality of life of its citizens.

Standards and Guidelines

- Maintain a minimum land size of 5000 acres
- Provide:
    - 10km minimum buffer around the city.
    - Robust ICT Infrastructure, Power supply, Water Supply, Water Treatment Plant (WTP) and Water Reclamation Facility (WRF)
    - Open and Green Spaces
- Encourage phased development

Note: Smart city guidelines apply in addition to the above.

5.32.3 Resort Cities Planning

A resort city is an urban area where tourism or vacationing is the primary component of local culture and economy.

Standards and Guidelines

- Locate these centres as guided by tourist attractions
- Integrate tourism zones with major communication and transportation networks and economic resources.
- Preserve the ecosystem and the primary attraction
- Cluster and integrate related secondary attractions
- Encourage mixed-use and compact pattern designs
- Discourage developments along major wildlife corridors, environmentally sensitive areas and environmentally fragile ecosystems.
- Plan for the location of basic support services such as electricity sub-stations, water reticulation systems and waste disposal sites
- Prepare a buffer plan establishing growth limits of the city and directing urban growth away from environmental assets and rich agricultural land.
- Require Environmental and Social Impact Assessments and Environmental Audits
- Regulate development in scenic and sensitive landscapes to minimize impact on the surrounding natural environment.

5.32.4 Metropolis and Megacities

Metropolitan area(s) are urban agglomerations or systems of cities (including urban, peri-urban and surrounding rural areas) that consist of more than one municipality.

A megacity is a very large urban centre with a population of more than 10 million people that is often made of two or more urban areas that have grown so much that they are connected.

Standards and guidelines

- Prepare physical, land use development plans for metropolitans and megacities, and integrate with existing Plans.
- Prepare sustainable mobility plans
- Plan and develop sustainable regional infrastructure projects eg roads, water, sanitation markets and collection centres etc. to stimulate sustainable economic productivity and strengthen urban-rural linkages
- Propose the establishment of a body to oversee the planning and management of the metropolis /megacity.

Disaster and Risk Management and Climate Change Adaptation

Table 61: Disaster and Risk Management and Climate Change Adaptation in planning for new cities

Disaster Risk	Mitigation
Urban Sprawl and Informal settlements	• Define urban growth limits and delineate buffer zones • Prepare Physical and Land Use Development Plans and resettlement Action Plans for affected populations • Encourage implementation of plans • Adherence to, PLUPA regulations, zoning policies, and building codes among others • Provide infrastructure and services, such as green spaces, sanitation, drainage, waste collection, health care and emergency response services
Climate change and degradation of biodiversity features	• Promote walking and cycling • Create artificial floodplains in cities – these are green areas that absorb the water that would otherwise flood the urban area • Require Environmental and Social Impact Assessments and Environmental Audits for development activities • Encourage the preparation of Environmental Management Plans • Encourage the use of energy-efficient systems and smart waste management systems • Encourage periodic risk assessments, monitoring and early warning approaches
Natural and manmade hazards, including; urban heat islands, droughts, floods, earthquakes, storms, volcanic eruptions, epidemics, technological and industrial accidents, infrastructure failures, chemical spills, explosions and fires	• Identify and plan vulnerable, hazard-prone and environmentally sensitive areas. • Identify and integrate evacuation sites in plans. • Provide green spaces and urban forest belts • Provide for emergency operation centres within cities • Observe specific zoning restrictions such as setbacks, buffer zones, etc for high-risk areas. • Restrict or limit development in hazard-prone areas • Encourage integrating developments with disaster-resilient urban design and technology • Encourage preparation of disaster management plans for cities • Encourage periodic assessment of critical infrastructure such as schools and hospitals

Source: Physical planning team; 2022

5.33 Industries

Industries are a group of productive enterprises or organizations that produce or supply goods, and services. They are generally classified as primary, secondary, tertiary, and quaternary. Secondary industries produce finished goods or are engaged in construction,

consume large quantities of energy and use machinery. For this reason, they are further classified as heavy and light depending on the quantities used.

Planning Principles

- Industrial symbiosis
- Inclusivity
- Ecological vitality
- Value chain system

General Guidelines Standards

- Observe plot coverage of not more than 75%.
- Create suitably sized plots that are functional, and accessible, to accommodate future expansion and enhance the local character
- Observe building lines as follows;
    - Major Communication routes (Highways) - 25m to 30m
    - Spine Roads (Major roads)-18m to 25m
    - Collector roads -15m to 18m
    - Access streets-12m to 15m
- Observe minimum road reserves as follows:
    - Major Communication routes - 60m
    - Spine roads (Major roads) - 40m
    - Collector Roads - 30m
    - Access streets - 25m
    - Service lanes - 15m
- Ensure the road reserves take account of the following provisions;
    - Stormwater drainage
    - Conveyance of industrial effluents
    - Water reticulation mains
    - Curb parking
    - Communication cables-fibre optic cables
    - Non-motorized infrastructures (Walk ways, Cycling lanes, Designated footpaths)
- Reserve a minimum of 10% of plot coverage for planting trees.
- Provide national/ international communication network;
- Co-locate industries in close proximity with related firms.

- Locate the industries in proximity to labour, communication routes, power, water and sewerage disposal facilities.
- Set aside about 8% of the total planned urban area for industrial use for the provision of various fundamental facilities as outlined below:

Table 62: Percentage Allocation of Land in an Industrial Area

Land use	**Allocation (%)**
Industrial buildings	55
Green spaces (parks, open spaces, squares etc.)	10
Utilities, services of facilities	20
Roads, parking lots	15

Source: Physical planning team; 2022

- Require EIA and EA for proposed and ongoing industrial developments as guided by EMCA.
- Require health and safety management plan for all industries
- Protect and enhance environmental and landscape features

Parking in Industrial areas

- Provide
    - two parking spaces plus 1 parking space for every 2 employees of the largest work shift for every 100 m^2 of gross floor space.
    - 0.5 spaces per 100sq.m of total gross floor area (GFA) or 1.8 spaces per 100sq.m gross leasable office/showroom area plus 1.2 spaces per 100sq.m of gross leasable factory/warehouse area, for Business parks
    - a minimum of 6 spaces per service bay plus 5 spaces per 100m^2 of gross floor area for the convenience store, fuel service stations and convenience stores.
    - 15 spaces per 100m^2 or 1 space per 3 seats, if there is a restaurant at the station.
    - One parking space per 30m^2 of gross floor space plus 1 space for every 2 employees on the largest work shift for warehouses
    - adequate dedicated parking bay for bicycles and motorcycles
    - pickup cum drop-off point for buses when picking and dropping employees

5.33.1 Heavy Industrial Areas

Heavy industrial areas are zones designated for the manufacturing of large, heavy items involving complex or numerous processes. They may produce heat waste that can cause pollution and pose a risk to the environment.

Standards and Guidelines

- The catchment population shall be 200,000-5,000,000 for heavy industries.
- The recommended land size shall be 200-500ha for a town with a population of 200,000 and 5,000,000 to provide between 20,000 and 50,000 jobs, based on an average industrial density of 40 workers per acre.
- Bus rapid transit systems and rail systems should be incorporated in industrial areas and integrated with other transportation systems to enhance efficient mobility.
- Provide buffer zones of not less than 500m between the industrial zones and residential areas. For noxious and hazardous industries, the distance should not be less than 1km.
- Provide plot sizes in industrial areas depending on the type of industry to be built, number of personnel, densities and plot coverages.
- Require EIA and EA assessments for all proposed and ongoing noxious and hazardous industries
- Consider wind direction in the location of industries to control air pollution
- Permit and prohibit uses in a heavy industrial zone as provided in Table 63.

Table 63: Permitted and Prohibited Uses in Heavy Industrial Zone

Permitted Uses	**Prohibited Uses**
• Noxious, offensive or hazardous industry • Vehicle repair and transport yard • General industries • Auxiliary uses to the industry • green spaces • Emergency services • Car Park and lorry parking area • Warehousing of not above 50% of the gross floor area	• Residential development • Major commercial centres • Hotels • Educational facilities • Child Care Centres • Major Transportation uses • Animal husbandry

Source: Physical planning team; 2022

5.33.2 Light Industrial Areas

Light industrial areas are designated zones or estates for manufacturing that use less capital-intensive machinery or production equipment.

Standards and Guidelines

- Distribute these estates throughout residential areas, at approximately one estate per catchment population of 30,000.
- Provide land sizes ranging from 20-50 ha, to cater for 1500-7500 workers at a density of 60 workers per acre.

- Locate on the major internal routes of the township with separated access from residential feeder roads.
- Protect the surrounding areas from any adverse effects of light industries.
- Provide buffers such as green spaces and a boundary wall between these zones and major internal roads, shopping and commercial centres, community buildings and schools.
- Provide basic site facilities/utilities for industrial areas such as piped water, waste management, electricity supply and firefighting.
- Integrate Bus Rapid Transit (BRT) and rail with other transportation modes to enhance efficient mobility.
- Provide loading and offloading zones depending on the size and operations of the industries.
- Provide spaces for ancillary uses such as:
    - Residential quarters
    - Operation and logistics Offices
    - Guard-house
    - Open storage
    - Retailing/exhibition spaces
- Provide a minimum of 1ha for the Juakali zone within the light industrial area.

Jua Kali/Workshop Areas

Jua Kali workshops are areas designated for small-scale traders and artisans under temporary or permanent shelters.

Standards and Guidelines

- Observe a minimum plot size of 0.25ha.
- Provide sheds with separate entry and exit points
- Provide common sanitation blocks, power supply, waste collection points and exhibition spaces.
- Provide fire assembly points, fire hydrants and fire extinguishers at strategic locations.
- Locate industries dealing with hazardous and flammable materials away from petrol stations.
- Permit and prohibit uses in the light industrial zones as provided in Table 64.

Table 64: Permitted and Prohibited Uses in Light Industrial Zones

Permitted Uses	Prohibited Uses
● Health facility ● Ancillary shop or office to service industry provided it does not exceed 500 m2 or 70% of built floor area, whichever is smaller ● Childcare centre ● Commercial outlets and markets ● Recreation areas ● Emergency service centres ● Service industry, Service station, Motor trading, Vehicle repair and transport yard ● Warehousing if not above 50% of the gross floor area	● Animal Husbandry ● Noxious industries

Source: Physical planning team; 2022

5.33.3 Industrial Parks

Industrial parks (IPs) are an agglomeration of both light and heavy industries within a geographical area.

Standards and Guidelines

- Consider the following when siting IPs:
    - Land availability and suitability
    - Proximity to rail lines, highways, airports, communication networks, dry ports, and/or sea or river ports, service providers and commercial activities
    - Compatibility to abutting land uses
    - Availability of raw materials, labour and ready market
- Provide for a diversity of plot sizes depending on the type of industry.
- Provide for phasing of the development
- Allocate special infrastructure zones for certification laboratories, quarantine services, and market intelligence units, where required.
- Allocate logistics zones including loading and unloading yards, parking lots, packaging facilities, transportation hubs, cargo-handling centres, raw material collection and storage depots, goods storage warehouses, etc.
- Provide for utility zones such as solid waste collection centres, power sub-stations etc.
- Provide residential zones that cover employee housing, guesthouses and hotels.
- Allocate space for green zones such as green belts and buffer zones along the park's boundaries, lawns, parks and water features, internal walkways between zones, etc.
- Provide support infrastructure as recommended below:

Table 65: Recommended Infrastructure within Industrial Parks

Infrastructure	Description
Internal roads	● Arterial and access/distribution roads network, with pedestrian walkways, in order to provide access to the entire park, as well as to the main highways nearby. ● Bicycle lanes and/or electric light-rail networks, as well as bicycle and/or electric golf-cart sharing systems, in order to reduce combustion engine-based vehicle dependency for short-distance commuting
Surface drainage	● Drainage on all roadways ● Gravity-based rainwater harvesting and rainwater storage tanks
Water supply	● Sufficient drinking and non-potable water, with separate distribution networks ● Wells, boreholes and reservoirs ● Water pumping station, water treatment plant and smart water metering
Sewerage	● Sewage and effluent collection and storage systems (separate for industrial and household needs) ● Systems for removal of contaminants from wastewater, storm run-off, and domestic sewage, through primary treatment of effluents ● Smart sewage metering
Solid waste management	● Segregation of wastes into different categories and colour-coded bins and containers (industrial non-hazardous waste, industrial hazardous waste, biodegradable waste, non-biodegradable waste, e-waste, construction waste, hospital and bio-medical waste, etc.)
Power supply	● Distribution substations at strategic locations, with a network of underground cables or overhead lines ● On-site renewable energy (rooftop solar PV panels or solar farm to serve the park) ● Smart energy metering
Street lighting	● Conventional or solar street lighting ● Smart energy-efficient lighting
IT connectivity, telecommunication, and ICT-enabled resident services	● High-speed Wi-Fi and internet services ● Robust data infrastructure system
Landscaping, public open spaces and green cover or vegetation	● Trees along the boundary and roads ● Open spaces of various types - natural, plazas, parks, or recreation areas (international planning norms require at least 10 % green space) ● Green buffers between zones ● Bio-diversity and planned planting of native flora
Specialized industrial support infrastructure	● Standard factory shells and warehouses with smart, sustainable building design ● Public depot warehousing and cold storage facilities ● Quality assurance services and quality control laboratory ● Truck parking and weighing station ● Fuel pumping station ● Administrative building, operation centre, exhibition centre and showrooms ● Banks, post offices, customs office ● research and development, incubation, training, innovation centre and knowledge hub

Infrastructure	Description
	● Market intelligence centre, one-stop shop, logistics and parking centres
Safety and Security	● Public safety infrastructure, including lighting and CCTV surveillance systems ● Emergency response centre/s (accidents and first aid, fire and chemical hazards, security incidents, natural disasters and crises, etc.) ● Healthcare centre, medical facilities ● Live air quality monitoring through a smart environment monitoring system ● Licence plate monitoring and speed control
A social and commercial centre	● Buildings for shopping and culture (restaurants, supermarkets, barber shops, swimming pools and sports facilities, etc.) ● Environment-friendly apartment complexes ● On-site daycare ● Auditorium and meeting rooms suitable for educational/training activities, business meetings, conferences, and community meetings ● Off-site infrastructure

Source: Physical planning team; 2022

Disaster Risk Management and Climate Change Adaptation

Table 66: Disaster Risk Management and Climate Change Adaptation for Industries

Disaster Risk	Mitigation measures
Climate-related hazards: Flooding Heat Storms(wind, sand)	● Identify and map sand and wind storm areas prone to climate-related disasters ● Plant trees to act as windbreaks ● Encourage structurally designed industrial buildings that can withstand wind storms ● Encourage preparation of climate adaptation and mitigation plans for industrial areas ● Encourage investment in climate-resilient industries
Pollution (water, land and air)	● Observe guidelines on the riparian reserves: ● Create green belts to serve as buffer zones ● Encourage o Installation of exhaust air scrubbers to filter the noxious gases o use of cleaner fuels (ultra-low sulfur) o Monitoring of air quality o Preparation of a waste management plan o Adherence to the provisions of the Noise and Excessive Vibrations in EMCA 2009 Regulations o Provision of acoustic insulation ● Observe at least 5% green spaces within industrial areas
Fire outbreaks	● Provide fire assembly points, fire hydrants, and fire sensors to be installed at strategic points. ● Encourage regular drills ● Provide adequate circulation spaces for ease of movement and adequate signage and directional aids to assist in evacuation ● Provide for adequate open spaces within industrial areas

Disaster Risk	Mitigation measures

Greenhouse effects	• Tree planting and greenery within the industrial areas
	• Encourage
	  ○ Use of appropriate technologies to reduce emissions
	  ○ Use of renewable energy such as solar and wind energy
	  ○ Preparation and implementation of waste management plans

Source: Physical planning team; 2022

5.34 Mining

Mining is the extraction of valuable geological materials such as precious stones and minerals, from the Earth. The extraction of minerals on the earth's surface, underground or underwater involves dredging, blasting and release of metals from mining sites through acid mine drainage and erosion of waste dumps. These can have consequences on the environment.

General Standards and Guidelines

- Prepare an action plan for quarry sites providing; Access roads, water, sanitation facilities, dispensary, staff quarters, well-dimensioned schematic diagram of the excavation, tunneling, decommissioning and rehabilitation plan among others.
- Require change-of-user to be done before the establishment of a new quarry site.
- Undertake an EIA before quarrying starts.
- Prohibit exploitation in ecologically sensitive areas
- Prohibit vertical faces exceeding 2.5 m when quarrying on soil, sand, gravel, soft rock or debris – these shall be worked in terraces/ benches or at a safe angle of slope.
- Require all quarry faces/cliffs to be securely fenced at least 3m from the edge of the cliff and at least 1.5 m high.
- For quarrying operations, the following safety distances as shown in Table 67 should be maintained:

Table 67: Safe distances for quarrying operations

Land use	Safe distances without blasting	Safe distances with blasting
Aerodromes/landing ground	To be determined by Kenya Civil Authority and Kenya Airport Authority	As determined by relevant authorities
Shopping centre, school and hospital	100m	
Individual house	50m	
Road/rail reserve	40m	

River/wetland/water catchment riparian areas	10m if the riparian reserve is 30m, a 40m buffer shall be provided (see Figure 33)	

Source: Physical planning team; 2022

- Discourage undercutting and tunneling in quarries and sand harvesting near built-up areas to avoid damage to property, injury or loss of life.
- Prohibit loose hanging rocks/material near or on the face of excavation/quarry.
- Encourage
    - Erection of barriers to check material rolling down the slope.
    - Erection of warning signs in appropriate font size and in local language, Swahili and English e.g., Danger Quarry Deep Pit' or Caution Flying Stone and Debris'.
    - Preparation of a decommissioning plan identifying suitable alternatives such as; Land restoration for agriculture, recreation, forestry and apiary (beekeeping), and water reservoir among others.

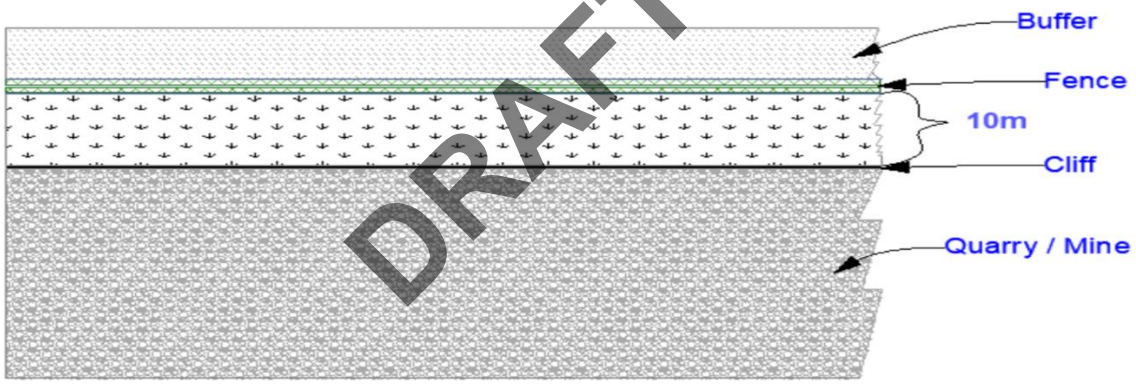

Figure 33: Illustration of a Quarry Site
Source: Physical planning team; 2022

- Establish the capacity of the County Disaster Preparedness Committees and local quarry operators on disaster preparedness and response through training and provision of appropriate equipment

5.34.1 Exploration of minerals

Standards and Guidelines

- Ensure the maximum area of exploration does not exceed what is recommended in the mining law

- Require that rehabilitation is done as per the EIA/EA Action Plan, in case of trenching and pitting.

5.34.2 Exploitation of minerals

Standards and Guidelines

- Prepare and implement resettlement action plans before the commencement of mining activities in case of displacement of people.
- Encourage benefit sharing with the communities.

5.34.3 Artisanal (small-scale) Mining

Standards and Guidelines

- Ensure that mining is restricted within designated mineral areas.
- Undertake change of user before the commencement of mining works
- Require an EIA in the designated areas and provide disaster vulnerability profiles for mining sites

5.34.4 Clay Harvesting for Brick Making

Standards and Guidelines

- Undertake an EIA and EA for large-scale brick-making.
- Prohibit clay harvesting within road reserves, near dwelling places, and other environmentally sensitive areas.
- The depth of clay harvesting pits should be determined by the underlying geology, existing land uses and ecological conditions.
- Clay sites should be divided into blocks so that rehabilitation can be done after harvesting each block.

5.34.5 Sand harvesting

Standards and Guidelines

- Prohibit sand harvesting;
    - within 100m of either side of any physical infrastructure including bridges, roads, railway lines, dykes, among others
    - areas of bio-diversity
    - beyond 1.8m in depth in lake shores and sea shores

- Encourage the designation of sand harvesting sites.
- Require an EIA and EA for sand harvesting sites
- Sand harvesting from any riverbed shall be undertaken in a way that ensures an adequate reserve of sand is retained to ensure water retention.
- Loading of sand will be done in the designated harvesting sites through controlled access points.

5.34.6 Red Soil Harvesting

Standards and Guidelines

- Undertake an EIA and EA for large-scale brick-making.
- Prohibit red soil harvesting within road reserves, near dwelling places, and other environmentally sensitive areas.
- The depth of red soil harvesting pits should be determined by the underlying geology, existing land uses and ecological conditions.
- Soil harvesting sites should be divided into blocks so that rehabilitation can be done after harvesting each block.

Disaster Risk Management and Climate Change Adaptation

Table 68: Disaster Risk Management and Climate Change Adaptation for Mining

Disaster Risk	Mitigation
Climate-related hazards: water level rise flooding Landslides	• Identify and plan mining areas • Encourage preparation of a climate adaptation plan for mining areas identified as being at high risk of climate disasters • Encourage investment in climate-resilient mining systems
Collapse of mines	• Conduct feasibility studies • Quarry sites should be mapped and planned • Encourage the use of appropriate technologies • Prohibit illegal mining in unauthorized areas • Require preparation and Implementation of an Environmental Management Plan (EMP)
Accidents in open-air mines and quarries	• Plan for utilization of decommissioned mines for recreational and conservation purposes • Provide emergency response infrastructure in mining areas (first aid clinics, emergency landing sites) • Fence excavated areas • Warning signs of appropriate font size should be provided • Sloping of edges should not exceed 45^0

Disaster Risk	Mitigation
Landslides in mining areas	• Rehabilitate exhausted mines • Encourage the building of gabions
Over-extraction (sand, stones, soil, coal)	• Prepare land use plans for mining areas • Demarcate areas permitted for mining • Restrict uncontrolled mining in areas of conservation and farmlands • Adhere to EMCA regulations on sand harvesting and red soils • Require an Environmental Impact Assessment and routine environmental audits
Emission of hazardous gas	• Conduct feasibility studies of the sites before mining to assess the composition of the mineral reserves • Encourage adequate training of personnel on new technologies and machinery

Source: Physical planning team; 2022

5.35 Drilling, Boring, Shafting and Tunneling

Drilling, boring, shafting and tunneling are all construction methods that involve digging a tube-like passage through the earth. The basic types of tunnel construction include cut-and-cover tunnels, constructed in a shallow trench and then covered over; bored tunnels, constructed in situ, without removing the ground above, immersed tunnel tube which is a tubes sunk into a body of water, conveyance tunnels and traffic tunnels.

Standards and Guidelines

- Undertake forward planning to secure land banks on underground real estate for future groundworks such as sewer, subways, and water conveyance among others
- Require EIA, EA and geological reports and studies
- Institute public safety measures (possible air, groundwater, or noise pollution, traffic problems, earthquake, land sliding possibility as well as evacuation and emergency response) before any work begins.
- Ensure proper marking with clear labels are erected on sites where work is in progress
- Encourage;
    - Regular communication and notifications regarding progress and any concerns as and when they occur on underground works.
    - Regular EIA's and EA's even after completion of work
    - Regular maintenance
    - Restoration or restriction of access from sites after de-commissioning of tunnels.

- Worker safety on-site (as per NCA guidelines)

5.36 Energy

Energy is the quantitative property that is transferred to a body or a physical system that can be recognized in the performance of work and in the form of heat and light (Wikipedia, 2023).

5.36.1 Electric Power Generating Plants/Sub-Stations

Standards and Guidelines

- Provide a buffer of 2 km for electric power-generating plants
- Provide a power wayleave of 30m on both sides of the National Grid
- Reserve a minimum of 5% of the exterior spaces in the Main receiving sub-stations for landscaping
- Locate main receiving sub-stations (275KV) away from residential areas, recreational open spaces and public facilities
- Provide a buffer zone of 50m between sub-stations and other land uses
- Provide a perimeter fence

Table 69: Land Requirements for Electricity Sub-Stations

Sub-stations	**Land size(m^2)**
Main receiving sub-station	16000
Main distribution sub-stations	2025
Electricity sub-stations	222.75
Single chamber	222.75
Double chamber	229.6

Source: Kenya Power and Lighting Company, 2022

5.36.2 Oil and gas infrastructure

Oil Tanks

Standards and Guidelines

- Locate proposed oil tanks 50 m away from any settlements
- Oil pump stations (pipeline) should be at least 2ha
- Observe a minimum of 10m away from any building or boundary while burying oil tanks.

- Prohibit parking of oil tanks in residential areas
- Require an EIA and EA.
- Ensure that the minimum length of the vent pipes is 4m above ground level, a minimum of 4m away from any dwelling place as well as a minimum of 10m away from a loading/discharge point or naked fire.
- Oil depots are classified as heavy industries and should follow the standards and guidelines set in this handbook

Liquefied Petroleum Gas (LPG)

Standards and Guidelines

- Locate away from any high-tension pylons or cables at a minimum distance of 15m.
- Prohibit all aerial obstructions at the site minimum distance for such obstructions shall be 10m.
- Require an EIA and EA.
- Locate 10m away from hazardous areas and sources of ignition e.g. welding, cutting, grinding, use of impact tools, electrical arcs, hot surfaces, and open flames areas.
- Ensure that the plant is fenced at a height 2m and has entrance and exit ways.
- Ensure that the facility is free from weeds, open drains; depressions, etc. and avoid the use of weed killers, which constitute a fire hazard.

Storage of LPG Tanks;

- Observe a minimum of 0.2ha for commercial liquefied petroleum gas storage
- Design and locate Bulk storage tanks and cylinders in accordance with industry guidelines.
- Observe a safe distance of 15m from the building, boundary or fixed source of ignition while installing storage tanks at filling plants for both car cylinders and domestic cylinders.
- Observe the following distances between storage tanks:
    - Storage tanks up to 20 tonnes – 5m
    - Storage tanks 20 to 40 tonnes – 7.5m
    - Storage tanks 40 to 60 tonnes – 10m
    - Storage tanks over 60 tonnes – 15m

5.36.3 Petrol Service Stations

Standards and Guidelines

- Observe a minimum size of 0.1ha
- Maintain a minimum frontage of 20m on the primary road
- The shape of the plot for the station is to be designed in a way that it suitably accommodates fuel pumps, offices, stores, compressor rooms, air pumps and convenience stores.
- Require an EIA and EA.
- Observe minimum distance of:
    - 500m between petrol stations
    - 150m for acceleration and deceleration lane
    - 15m from the edge of the road to the nearest pump
- Locate at a minimum of 100m from any public institution and semi-public buildings such as schools, churches, public libraries, auditoriums, hospitals, clinics, theatres, public playgrounds, etc.
- Observe a radius of 50m away from all built-up areas
- Provide a buffer of 30m from any residential building for petrol pumps.The buffer zone can be devoted to any non-residential land use.
- Ensure provision of a solid wall 3 m in height where the site adjoins the side or rear boundary of a residential plot
- Permit location of a petrol service station only on a site specifically zoned for the purpose or by special consent in areas zoned Special Shopping, General Shopping or for industrial purposes
- Locate within a growth centre or an urban area except in circumstances where it can be shown through appropriate studies that the need exists otherwise.
- Ensure erection on a level rather than sloping site to prevent rolling of discarded materials such as cans, drums, etc.

5.36.4 Solar Energy

Guidelines and Standards

- Designate sites for development of solar energy projects such as solar farms and recycling and disposal of waste.
- Designate wayleaves for access roads and power lines.

- Require an EIA and EA.
- Adhere to the existing zoning regulations

5.36.5 Wind Energy

Standards and Guidelines

- Designate and plan sites for the development of wind power generation facilities
- Consider the following when siting a wind power farm:
    - Wind potential
    - Proximity to Energy Highways
    - Radar interference
    - Site Accessibility
    - Geology, Ground Works and Excavation
    - Ecological interest
    - Historic and tourist interest
    - Wind shadow
- Prohibit the location of wind power generation facilities in areas of scenic beauty, national parks, habitats of bird species
- Locate the wind farms away from flight paths and military aircraft flying areas because of the height of the turbines and electromagnetic fields generated
- Require an EIA and EA
- Designate wayleaves for power line installation connecting to the national grid

5.36.6 Nuclear Energy

Standards and Guidelines

Siting considerations for nuclear energy facility:

Table 70: Siting considerations for nuclear energy facility

Criteria	Desirable Parameters
Population density within a 10 km radius	Less than two-thirds of the population average
Population within Sterilised Zone	Less than 20000
Distance of population centres (> 10,000 person)	More than 10 km
Distance of large population centres (> 100,000 person)	More than 30 km

Terrain	Reasonably flat up to 20 km
Distance from facilities involving storing, handling inflammable, toxic, corrosive material and any mining activities.	More than 5 km.

Source:

- Identify and map potential nuclear energy sites
- Designate sites for cooling and waste management facilities
- Provide adequate wayleave for the transmission of energy generated
- Provide access to production sites
- Require geological analysis for the potential sites
- Require an EIA and EA.
- Encourage Preparation and implementation of appropriate emergency preparedness and response plan
- Encourage greening to act as buffers
- Comply with the nuclear regulatory authority guidelines and standards

5.36.7 Geothermal Energy

Standards and Guidelines

- Prohibit residential development within 5km of the geothermal power stations due to Hydrogen sulphide (H_2S) emissions.
- Map and designate identified strategic areas suitable for geothermal energy production.
- Identify and map the recharge catchment areas for conservation purposes
- Require an ESIA and EA.
- Consider the area's topography when selecting a location for the power plant and determining routes for the gathering/injection system.
- Require topographical surveys in hilly or mountainous terrain before plant siting, if such data does not already exist.
- The power plant should be located with respect to well pads, to minimize overall facility costs by considering the following:
    - Power plant excavation requirements and soil characteristics
    - Equipment orientation

- Utility supply (including access to water)
- New access roads
- Existing infrastructure

- Restrict access to the geothermal area

Disaster Risk Management and Climate Change Adaptation

Table 71: Disaster Risk Management and Climate Change Adaptation for Energy Sources

Type	Disaster Risk	Mitigation
All	Climate-related hazards: Drought Cyclones flooding	● Identify and map energy systems prone to climate-related disasters ● Encourage preparation of a climate adaptation plan for energy systems in high-risk areas ● Encourage investment in climate-resilient energy systems ● Encourage the promotion of carbon sequestration through energy programmes
Hydro energy	Flooding	● Locate the plant in hilly areas with clear overflow ● Encourage the preparation of a flood risk management plan ● Encourage a hydrology feasibility study before the establishment
	Land use	● Locate hydro plants in hilly areas to save on the extent of land required
	Dams burst and collapse	● Designate sites for staff quarters, evacuation points, storage and maintenance bays upstream opposite the dam ● Plan for cluster settlements in low-lying areas away from the projected path of water in the event of dam burst/collapse ● Observe riparian reserve ● Prohibit human settlement on land around the dam. Allow forestry and farming ● Require EIA, EA and engineering audits for dams annually to ensure safety and structural integrity ● Encourage the installation of water level monitors

Type	Disaster Risk	Mitigation
		• Encourage provision of drains in anticipation of dam breakouts to guide flow with minimal disruptions
	Disruption of aquatic systems	• Encourage the provision of aquatic management plans to minimize the impact
Oil and Gas	Oil/gas spills	• Encourage preparation and implementation of shipboard oil pollution emergency plan and training manual • Encourage preparation of vessel-specific oil spillage prevention and response plans for refueling operations, waste management Plans
	Fire outbreaks	• Designate sites for fire assembly points • Encourage the preparation of a detailed fire control plan •
Solar and Nuclear Energy	Fire outbreaks	• Encourage the provision of firefighting equipment and training of operating technicians • Encourage the installation of fire hydrants and fire sensors strategically within the plant • Encourage storage of flammable materials separately from the plant
	Environmental pollution	• Designate sites for recycling and disposal of solar energy waste
	Environmental degradation	• Encourage the preparation of an environmental management plan
	Electrical accidents	• Encourage inspection of equipment to ensure they are in safe working condition. • Encourage the wearing of appropriate PPE for electrical safety
	Earthquakes/Tsunami	• Require seismicity analysis and fault assessment before establishment • Encourage the installation of backup systems that are supposed to stabilize the reactor after the earthquake • Require ESIA • Encourage the collection of early warning data on earthquakes for early action

Type	Disaster Risk	Mitigation
	Fire outbreaks	• Provide a buffer around the nuclear plants • Locate facilities involving storing and handling inflammable, toxic, corrosive material and any mining activities far away from the plant • Encourage the installation of fire hydrants and fire sensors Strategically within the plant
	Exposure to radioactivity	• Locate plants 10km away from human settlements • Encourage designing and development of the plant to reduce radioactivity exposure • Encourage the provision of employees with the product Material Safety Data Sheet (MSDS), personal protective equipment (PPE) and training to effectively utilize the MSDS and on machinery and reactor operations • Encourage the preparation of an emergency response plan

Source: Physical planning team; 2022

5.37 Green Spaces

These are areas or landscapes that are undeveloped (do not have buildings or other built structures) and are partly or completely covered with grass, flowers, trees, shrubs, or other vegetation. They include playgrounds, gardens, parks, forests, natural water bodies, etc. set aside for ecosystem sustainability, recreational and aesthetic purposes.

Standards and Guidelines

- Map and prepare an inventory of all existing green spaces
- Adopt of hierarchy in the allocation of land for green spaces as follows:
    - County and sub-county - 2ha provided at prominent locations in the urban areas, at the urban fringe areas or in proximity to major transport interchanges.
    - Urban green spaces - 1 ha, providing facilities for recreational activities of an urban population.
    - Local green spaces - 0.15ha, providing sitting-out areas and children's playgrounds to serve the neighbourhood population.

- Designate areas for green spaces within residential, commercial, industrial and educational areas among others.
- Consider age group, population density and income levels when determining the type of green space.
- Prepare detailed site plans for parks to enable sustainable use.
- Provide public access with a minimum of 12m
- Locate close to
    - Neighbourhoods to ensure minimum time spent accessing green spaces.
    - Car or bus dropping-off points
    - Amenities and facilities such as community centres and social halls, health centres, local shops, police stations, primary and secondary schools to enhance safety.
- Integrate with other green spaces through walkways, cycling trails and greenways.
- Encourage the planting of trees and other vegetation to enhance the aesthetics and break the monotony of concrete
- Provide infrastructure for people living with a disability such as ramps and visual aids to access green spaces. Table 73 provides the planning standards for green spaces using the catchment population

Table 72: Planning standards for green spaces using the catchment population

Type of green space	**Location**	**Minimum land Size**	**Catchment pop**	**Distance to green space**	**Building site coverage**	**Facilities**	**Prohibited uses**
Play ground	• Residential areas • ECDE schools	0.15 Ha	1000	400m 10min walking	≤5%	• Playground equipment, • Restroom • Benches • Water points • Lighting • Litter bins • Bicycle racks	• Car parking & driving • Shops • Dumping
Gardens	• Neighbour hoods	0.1-0.4 Ha	2000-5000	400m-2km 30min walking	≤10%	• Picnic shelters • Benches • Restrooms	• Car parking • Kiosks

Type of green space	Location	Minimum land Size	Catchment pop	Distance to green space	Building site coverage	Facilities	Prohibited uses
	• Major nodal points • Secondary roads • Central business districts • Hospitals • Commercial areas • Government offices					• Drinking water • Lighting • Vegetation • Litter bins • Drainage systems • Handicapped facilities • Children recreation furniture	• Dumpsites • Highrise buildings
Parks	• Neighbourhoods • Towns • Cities • High-density areas • Peri-urban /urban fringe areas • Natural spaces such as rivers, forest	0.4-20 Ha	No limit	• 1.2km-8km-parks within neighbourhood • No limit for large parks within cities and peri-urban areas	• ≤10%-small parks • ≤20% large parks	• Benches and other seating facilities • Restrooms • Picnic shelters • Signage; • -Public lighting, • Drinking fountains • restaurants • Litter bins • -Vehicle barriers • Pedestrian direction signs • Hedge fences and gates • Sculpture and artworks	• Kiosks • Dumpsites • Cultivation • Petrol filling stations • residential houses • Commercial buildings • High rise buildings • Electric power plants

Type of green space	Location	Minimum land Size	Catchment pop	Distance to green space	Building site coverage	Facilities	Prohibited uses
						• Water sports features & equipment	
Urban Nature trails	• Neighbour hoods • Nature Conservation areas such as rivers and forest • Disused railways & quarries	15-30 m wide	No limit		-	• Benches and other seating facilities • lighting • Restrooms • litter bins	No developmen t allowed

Source: Physical planning team; 2022

Table 73: Planning standards for green spaces using circulation space

Type of green space	Location	Circulation space	Building site coverage
Play ground	• Residential areas • ECDE schools	$0.5m^2$	≤5%
Gardens	• Neighbourhoods Major nodal points, • Secondary roads, • Central business districts • Hospitals • Commercial areas • Government offices	$1m^2$	≤10%
Parks	• Neighbourhoods • Towns • Cities • High-density areas • Peri-urban /urban fringe areas • Natural spaces such as rivers, forests	$2m^2$	≤10%- small parks ≤20% large parks
Urban Nature trails	• Neighbourhoods • Nature Conservation areas such as rivers and forest • Disused railways		-

Source: Physical planning team; 2022

5.37.1 Urban Greening Strategy

Urban greening is the process of landscaping and foresting urban areas to create mutually beneficial relationships between city dwellers and their environments thereby contributing to improved quality of life (Ans Global, 2017)

Urban Greenery Strategies include:

i. **Skyrise greening** is a strategy aimed at extending greening skywards in the built environment. It refers to both rooftop and vertical greenery.

ii. **Roof greening-** characterized by planting works on structural slabs with a main focus on the horizontal dimension. Typical examples include roof gardens, and greening on top of noise enclosures.

Figure 34: illustration of Roof Greening

Source:https://www.archdaily.com/976437/how-singapore-is-pioneering-the-way-to-creating-a-greener-urban-environment

iii. **Vertical greening**- refers to greenery on vertical facades/ surfaces. They include planting of climbing and/or weeping plants along the edges of buildings or structures

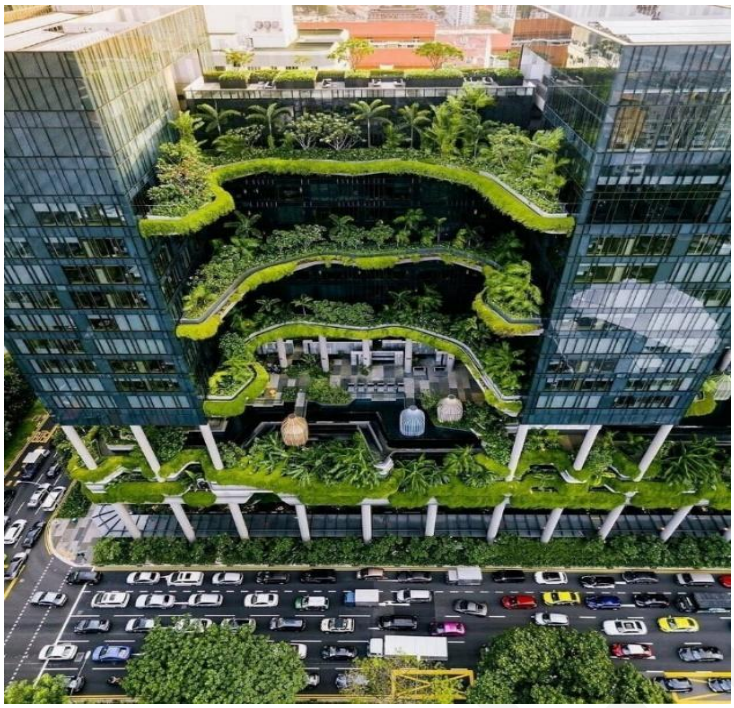

Figure 35: Illustration of Vertical Greening

Source: https://wanderinglilies.com/singapore-green/

General Standards and Guidelines

- Encourage protection of nature-in-city assets, involving spontaneous natural remnants, champion-calibre tree stock, tree preservation in construction sites, salvaging outstanding trees by transplanting, and timely tree care
- Identify and designate tree conservation areas, roads and sites with a significant number of champion trees i.e. the largest known trees of a particular species
- Encourage strengthening of local knowledge and capability of urban greening
- Encourage revitalization of dry and old river courses or canals by cleaning the watercourse in conjunction with the greening of the banks to create blue ways bordered by greenways to serve as linear urban parks.
- Encourage green walls to bring benefits similar to green roofs, plus the more prominent visual amenity to invigorate the cityscape.

Standards and Guidelines

Greening in residential developments

- Maintain a minimum standard of 0.1m^2 per person of local open space in public housing developments and comprehensive residential developments

- Observe a minimum of 10% green coverage.
- Encourage roof greening designs in high-density residential areas
- Encourage green hedges to increase visual amenity.

Greening in industrial developments

- Ensure provision of green spaces in physical and land use development Plans
- Observe a minimum of 10% plot coverage for landscaping use.
- Maintain a minimum standard of 0.05m^2 local open space per worker
- Encourage the provision of communal podium gardens and sky gardens with greenery on industrial buildings
- Rehabilitate disused quarries to alternative uses such as nature trails

Greening in commercial developments

- Observe a minimum of 0.02m^2 local open space per worker for landscaping
- Use setbacks for urban greenery.
- Encourage roof greening in building plans.
- Encourage green hedges to increase visual amenity.

Greening in utilities

- Avoid planting trees or shrubs with penetrating roots within 3m from the centre line of any existing or proposed water mains and 3m from the edge of drainage pipes. Clearance distance can be reduced to 1.5m if the size of the water mains affected is below 600mm.
- Avoid planting trees or shrubs within 1.5m around the covers of manholes, and hydrant valves, or within 1m from hydrant outlet.
- Encourage the use of sky-rise greenery, vertical greening and buffer strips to screen off the utility facilities for aesthetics
- Integrate drainage channels/systems with greenery.

Greening in roads and highways

- Encourage the planting of trees along pavements and road corridors
- Discourage planting of trees and/or shrubs and other under-story plants that obscure visibility

- Locate planter beds and tree pits away from underground utility services and manholes
- Encourage planting of trees and shrubs after road construction to restore the natural environment

Disaster Risk Management and Climate Change Adaptation

Table 74: Disaster Risk Management for Green Spaces

Disaster Risk	**Mitigation**
Insecurity	● Encourage the provision of security personnel and installation. ● Provide for adequate lighting
Stormwater floods	● Encourage preparation of a flood mitigation plan ● Encourage harvesting and reusing stormwater by Installing pipes, reservoirs and other conduits ● Encourage use of contemporary drainage technologies such as bio-retention, vegetated swales ● Prohibit tree cutting
Fires	● Locate fire stations in close proximity ● Designate specific smoking zones. ● Encourage the provision of adequate fire extinguishers and hydrants at strategic points within the green spaces.
Land pollution	● Designate sites for solid waste collection ● Encourage recycling, reusing and reduction of waste in green spaces
Deforestation	● Designate spaces for urban forestry ● Provide space for tree nurseries within the green spaces

Source: Physical planning team; 2022

CHAPTER 6: HUMAN RESOURCE AND OFFICE REQUIREMENTS

6.1 Overview

Human resource and office requirements are key requirements in ensuring that physical and land use planning services are carried out effectively by planning authorities at the national and county levels of government. The chapter provides for the distribution of the physical and land use planning functions, office requirements of a physical and land use planning authority, human resource and for physical and land use planning authorities and firms.

6.2 Distribution of the Physical and Land Use Planning Function

The function of physical and land use planning has been unbundled and distributed between the National Government, County Governments and the National Land Commission as follows:

Table 75: Distribution of the Physical and Land Use Planning Function

National Government	County Government	National Land Commission
1. Formulation of general principles of land planning and coordination of planning by the counties to ensure uniformity and quality in delivery of planning services in all parts of the country	1. Preparation, adoption and implementation of County Physical and Land Use Development Plans	1. Monitor and have oversight responsibilities over land use planning throughout the country
2. Capacity building and technical assistance to counties to ensure adequate and appropriate skills and competencies for the delivery of physical planning services	2. Implementation of National Physical Planning Policies, Strategies and Standard	2. Manage public land on behalf of National and County Governments
3. Coordination of the preparation of inter-county/regional physical and land use development plans	3. Development Control and enforcement of compliance	3. Process applications on subdivision, change of user, extension of user and renewal of leases
4. Coordination of preparation of physical and land use plans for strategic national projects – e.g., Special Economic Zones, Transport Corridors, LAPSSET, Resource management plans, Industrial Parks Technology and Resort Cities	4. Monitoring and evaluation of County Spatial Planning	4. Cause the preparation and approval of development plans for the management and use of reserved public land

National Government	County Government	National Land Commission
5. Formulation and Implementation of National Spatial Plan and Land Use Policy for optimal use of land and natural resources	5. Conflict Resolution on matters arising from County Spatial Planning	
6. Coordinate preparation of Maritime Spatial and of Inter- Coastal Zone Management Plans	6. Advising NLC on land reservation, alienation and acquisition on County specific projects	
7. Formulation of general Physical Planning Policies, standards and guidelines	7. Research on County Spatial Planning matters	
8. Follow up on the implementation and compliance of the Physical planning policies, standards, Regional Plans and the National Spatial Plan	8. Preparation of annual reports on the State of County Spatial Planning	
9. Research and dissemination of information on physical planning matters		
10. Resolution of physical planning conflicts arising from National and Regional planning		

Source: Physical planning team; 2022

6.2.1 Office Requirements of a Physical and Land Use Authority

i. Development control unit

Section 20(h) provides that the County Director of Physical Planning shall issue development permission and other development control instruments with the approval of the county executive committee member.

The Third Schedule of the Physical and Land Use Planning Act, 2019 obligates County Government to consider development applications.

ii. Land information system

Section 20(h) of the Physical and Land Use Planning Act, 2019 mandates the County Director of Physical Planning with the responsibility of maintaining a land information system to guide physical and land use planning.

iii. Funding

Implementation of plans will require appropriate financial resources. A range of funding opportunities exists including National Government Funding Programs, donor funding and public-private partnerships.

iv. Physical Planning Departments

These departments are tasked with the administration and management of physical

and land use planning in Kenya.

v. Constant periodic training of staff

Periodic training improves the knowledge and skills of staff therefore enhancing performance.

vi. Electronic Document Management Systems

The digital system seeks to improve service delivery in land administration and management. It facilitates development control by speeding development application processes and providing timely information to decision-makers.

vii. Geographical Information System Laboratory

This will promote the utilization of the Geographical Information System in capturing, storing and displaying spatial data.

viii. Office equipment (computers, stationery, workstations, cabinets)

Office equipment such as computers, stationery, workstations, and cabinets, among others, are vital for increasing the overall functioning speed of an office and its staff members.

6.2.2 Human Resource Requirements of Physical and Land Use Authorities

For the planning authorities at both levels of government to deliver their mandate, the following staffing levels are required: The recommended planner-to-population ratio is 1:15,000.

National Physical and Land Use Planning Authority

Table 76: Human Resource Requirements of a National Physical and Land Use Authority

NATIONAL LEVEL		
S/NO.	**DESIGNATION**	**REQUIREMENT (PERSONNEL)**
1.	Director General	1
2.	Director (As per the Divisions)	6
3.	Deputy Director	6
4.	Assistant Director	53
5.	Principal Physical Planner	59
6.	Senior Physical Planner	59
7.	Physical Planner	50
8.	Principal Physical Planning Assistant	3
9.	Senior Physical Planning Assistant	6
10.	Physical Planning Assistant I	47
TOTAL		**101**

Source: Physical planning team; 2022

County Physical and Land Use Planning Authority

Table 77: Human Resource Requirements of a County Physical and Land Use Authority

S/NO.	DESIGNATION	MINIMUM REQUIREMENT (PERSONNEL)
1.	County Director for Physical and Land Use Planning	1
2.	Deputy county director of physical and land use planning	2
3.	Assistant county director in charge of Divisions	5
4.	Principal Physical Planner	1 per sub-county
5.	Senior Physical Planners	5 per sub-county
6.	Physical Planners	1 per Ward
7.	Physical Planning Assistants	1 per Sub County

8.	GIS technicians	1 per Sub County
9.	Enforcement officers	4 (per sub-county)
	Building Inspectors	2 (per Ward)
10.	Development Control officers	2 per Ward

Source: Physical planning team; 2022

NOTE: The aforesaid officers will closely work with technical officers from the County Government departments namely: Architects, Civil and Structural engineers, Enforcement Officers, Public Health Officers, Environmentalists
The proposed Five (5) Divisions include; Forward Planning, Research & Policy, Development Control, Enforcement and Compliance, Urban Design and Development.

The urban institutions (City, Municipality and Town Committees) will have their planning departments as provided for under the Urban Areas and Cities Act, 2011.

6.2.3 Human Resource and Office Requirements for Physical and Land Use Firms

The Physical and Land Use Planning Act, 2019 introduces the procurement of planning services. For this to actualize planning firms are expected to have the following requirements:

Human resource requirements include:

- Principal Consultant (Registered, Practising Physical Planner)
- Physical Planners
- Assistant Physical Planners
- Environmentalists
- GIS Experts
- Sociologists
- Land Surveyors
- Urban designers
- Infrastructure Experts
- Planning Interns
- Accountants
- Legal Advisor

- Business sourcing team
- Support staff (Secretary, messenger, cleaner)
- Office space
- Computers, laptops, printers, large format plotters, projectors, furniture, Licensed software, storage cabinets, vehicles
- Legal and statutory requirements
- Company limited by shares or Private Partnerships
- Single business permit
- KRA Personal Identification Number (PIN)

Basic office equipment requirements include**;**

- Work stations (desk, chair, computer)
- File cabinets
- High-speed internet access
- Paper shredder, stapler and paper punch
- Backup drive
- Laptops and computers
- Printer or Multipurpose machine
- Uninterruptible Power Supply (UPS)
- Telephone and/or VoIP
- Surge protector
- Extension cables
- Relevant computer and GIS software
- Network Router
- Adequate storage
- Survey equipment (RTK, GPS)

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APPENDIX

PLANNING TEAM

S/No.	Officer Name	Organization
1.	Augustine K. Masinde	State Department for Physical Planning
2.	Gertrude Rapong'o	State Department for Physical Planning
3.	Miriam Wambugu	State Department for Physical Planning
4.	Elizabeth Nguah	State Department for Physical Planning
5.	Patrick Mutai	State Department for Physical Planning
6.	Veronicah Musee	State Department for Physical Planning
7.	David Wanjala	State Department for Physical Planning
8.	Sammy Muyeyia	State Department for Physical Planning
9.	John Kirwa	State Department for Physical Planning
10.	Dominic Irungu	State Department for Physical Planning
11.	Zudiah Shamir	State Department for Physical Planning
12.	Mercy Ndung'u	State Department for Physical Planning
13.	Mercy Nturibi	State Department for Physical Planning
14.	Susan Kerubo	State Department for Physical Planning
15.	Charles Onditi	State Department for Physical Planning
16.	Collins Korir	State Department for Physical Planning
17.	Mercy Ateka	State Department for Physical Planning
18.	Faith Akinyi	State Department for Physical Planning
19.	Kevin Chesire	State Department for Physical Planning
20.	Irene Mugo	State Department for Physical Planning

21.	Melody Lijoodi	State Department for Physical Planning
22.	Grace Katheu	State Department for Physical Planning
23.	Rose Suyianka	State Department for Physical Planning
24.	Nicholas Kerepei	State Department for Physical Planning
25.	Rose Munene	State Department for Physical Planning
26.	Maureen Njeru	State Department for Physical Planning
27.	Esther Wanjiku	State Department for Physical Planning
28.	Pierre Maggie	State Department for Physical Planning
29.	Danreage Gikunda	State Department for Physical Planning
30.	Samuel Morara	State Department for Physical Planning