HANDBOOK NO. 1

# THE NATIONAL BUILDING CODE, 2024

# INTERNAL AND EXTERNAL SERVICE SYSTEMS OF A BUILDING

NCA
NATIONAL CONSTRUCTION AUTHORITY

## 1.0 Overview

This handbook covers the following parts of the National Building Code.

Part XIV- Water Services, Drainage, Waste Disposal and Storm Water Drainage
Part XV- Electrical Installations
Part XVI- Landscaping
Part XVII- Non-Water Borne Waste Disposal
Part XIX- Refuse Disposal
Part XXIV- Access Roads, Cul-De-Sacs and Other Private Roads

## 2.0 PART XIV- WATER SERVICES, DRAINAGE, WASTE DISPOSAL AND STORM WATER DRAINAGE

This part is covered in paragraphs 244 - 311 of the Code.

The provisions outlined provide standards for design, building materials, products and systems for water services, drainage and waste disposal.

### 2.1 Key Points

#### 1. General

*a. Design Standards*

All installations must adhere to recognized standards using reliable design methods and materials.

*b. Preparation of designs and supervision of works*

Preparation of designs including supervision of works during the building construction phase shall be carried out by a registered licensed professional (mechanical engineer) as per provisions of paragraph 6 of the Code.

#### 2. Compulsory drainage requirements

245. (1) An owner shall ensure that a suitable means of disposal of water borne sew age is available and shall provide a drainage installation.

#### 3. Control of objectionable discharge

247. (1) A person shall not cause or permit sewage discharged from a sanitary fixture to enter—

(a) a storm-water drain, storm-water sewer, an excavated or constructed watercourse;
(b) a river, stream or natural watercourse, whether ordinarily dry or otherwise; or
(c) a road or another construction site.

(2) A person shall not cause or permit storm-water to enter a sewer installation.

**4. Conservancy tank, septic tank, French drain and soak pit**

258 (2) A conservancy tank, septic tank or biodigester, to be used on a construction site for the reception of sewage shall be—

(a) designed and constructed in such a manner that it will be impervious to liquid;

(b) sited—

(i) at a distance of between 4m and 10m from the building which is served by the conservancy tank, septic tank or biodigester;

(ii) in such a manner that there will be a ready means for the clearing of the tank;

(iii) so as not to endanger the structure of a building or service on the construction site or neighbouring parcel of land; and

(iv) within the boundary.

**5. Discharge from washing space**

259. (1) A building used as a stable, garage, cowshed, dairy, kennel, butchery, abattoir, a vehicle washing space, or other similar space that requires regular cleaning, which produces waste water or soil water shall be con nected to a drain which shall serve the building or space.

(2) The space referred to in sub-paragraph (1) shall be—

(a) paved with approved impervious material;

(b) graded to a gully which shall be fitted with a removable grating;

(c) connected to at least two approved silt traps, grease traps, petrol or oil interceptors;

(d) roofed over; and

(e) surrounded by a kerb that is at least 100mm high, or elevated above the immediately surrounding ground level by at least 100mm.

**6. Ducts for discharge pipe**

268. (2) Where a discharge pipe is located within a building and it is desired that the pipe be enclosed, it shall be enclosed within a duct.

(3) Despite sub-paragraph (2), a part of a pipe may be built into brickwork or concrete, where the interior of the part is rendered readily accessible for cleaning.

**7. Access to drainage installation**

269. (1) A drainage installation shall be designed and constructed in a manner that permits access to the interior of a pipe in the installation, for the purposes of inspection, testing and internal cleaning.

**8. Tests for discharge pipe**

274. (1) After a drainage installation has been completed and partially back-filled, the drain shall—

(a) be tested with an air test conducted by pumping air into the drain un der a pressure of at least 0.35 kPa (35 mm head of water); and
(b) be deemed to have passed the test if the pressure after three minutes is at least 0.25 kPa (25 mm head of water).

(2) A discharge pipe or ventilating pipe shall be tested as follows, after a drainage installation has been completed—

(a) all traps shall be filled with water;
(b) the outlets of all ventilating pipes shall be plugged; and
(c) the air test specified in sub-paragraph (1) shall be applied.

**9. Effluent entering the environment or public sewer**

303. All effluent which on disposal is discharged into the environment or a public sewer shall be compliant with the Environment Management and Coordination Act, 1999.

304. Trade effluent, including manufacturing liquid waste, or other effluent shall not be discharged into a sewer, unless it has been treated in an approved manner.

305. (1) The occupier of premises from which trade effluent is discharged into a sewer shall construct, on the premises, a manhole connected to the pipe or channel conveying the effluent.

(2) An officer authorised by the approving authority shall have access to the manhole referred to in sub-paragraph (1) and may examine the trade effluent.

(3) A provision shall be made in a manufacturing plant to stabilize trade effluent before the trade effluent is discharged into a public sewer.

## PART XV- ELECTRICAL INSTALLATIONS

This part comprises of paragraphs 312 - 328 of the Code.

The provisions outlined in this part detail electrical installation work shall include electrical engineering services that shall be installed in a building to make it habitable. The work involves analysing, planning, and detailing the electrical engineering services of buildings to ensure quality, safety, and reliability of the installation while meeting regulatory standards and guidelines.

### 3.1 Key Points

**1.General**

*(a) Design Standards*

All installations must adhere to recognized electrical engineering standards using reliable design methods and materials.

*(b) Preparation of designs and supervision of works*

Preparation of designs including supervision of the electrical installation works during the building construction phase shall be carried out by a registered licensed professional (electrical engineer) as per provisions of paragraph 6 of the Code.

*(c)Testing of and certification of installation*

All installation work in this part shall require testing and certification to meet prescribed standards.

## 2 Internal Power Supply and Lighting

Internal power installation work in a building comprises the process of installing electrical wiring / conductors and other associated electrical devices to provide power supply sources for various applications.

- All installation work related to internal power supply and lighting in a building shall be carried out in accordance with the provisions of paragraphs 312 – 327, and shall be carried out to ensure –
- Quality of the installation – by using materials and equipment that meet standards/ specifications.
- Safety of the installation – by following safety guidelines, regulations and standards.
- Reliability of the installation – that delivers power supply without failure or disruption.
- Sustainable installation – using materials that mitigate climate change and that promote sustainable development. Ensuring energy use in buildings is efficient and promoting renewable sources of energy in line with Climate Change commitments.
- Some elements of installation work in this electrical service include –
- Siting of a power house – to be situated where it is accessible by a power utility company.
- Location and position of electrical appliances like switches, sockets etc - at a height which is accessible by all persons including PWDs in accordance with KS ISO 21542 (Building Construction – Accessibility and usability of the built environment). Providing for universal access standards to all persons.
- Lighting illuminations levels in a building area/ space – levels shall be in accordance with the Lighting Guide issued by CIBSE. Lighting levels should provide comfortability to the users.
- Wiring diagram - a schematic diagram in a permeant form and showing the main distribution circuit and control of the wiring of the building shall be displayed on a wall beside the main switch of that building (para 322 (1).

## 3. Standby generator

If required, shall be located where generator noise levels are not a nuisance to the building owner/ neighbors/ environment. Noise levels are to be within the provisions of EMCA 1999 (para 326 (6)).

*Standby Generator*

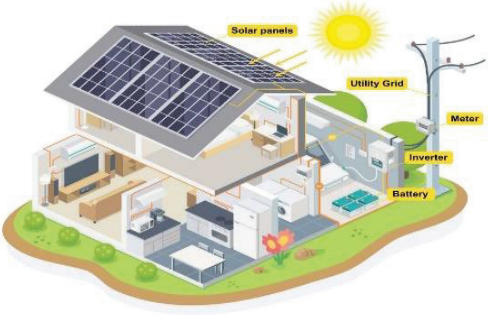
**4. Master Antenna TV Station System**

Installation shall be carried out as outlined in paragraph 328(1) of the Code.

*Master Antenna TV Station*

**5. Alternative Energy Sources in a Building**

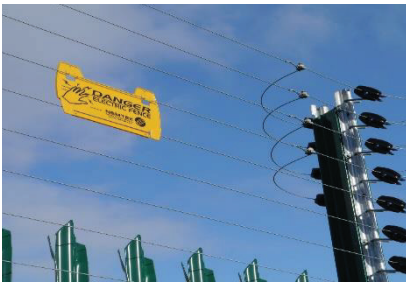
The code provides for standards for installation of solar energy systems whose installation shall be carried out in accordance with provisions of paragraph 328(2). However, other sources of energy more so renewable green energy sources are encouraged to mitigate climate change.




*Solar Power System*

**6. CCTV Security Surveillance System and Electric Fence**
Standards for installation are provided in paragraph 328(3).

*CTV Camera*



*Electric Fence*

**7. Intruder Alarm System**
Standards for installation are provided in paragraph 328(5).

**8. Structured Cabling**
Installation shall be carried out in accordance to the provision of paragraph 328(4) of the Code.

*Network Switch and Ethernet Cables*

*Fibre Optic Cable*

**9. Telecommunication Installation**
Installation shall be carried out in accordance to the provision of paragraph 328(6 and 7) of the Code.

A telecommunication service duct shall be provided separate from other services / utility ducts.

A common entry duct within a building connected to an access point that's installed outside the boundary wall of the plot/ construction site shall be provided.

## 4.0 PART XVI - LANDSCAPING

This part comprises of paragraphs 329 - 334 of the Code.
The provisions outlined in this part provides standards for design, building materials and products for landscaping.

## 4.1 Key points

### 1. General

*a. Design Standards*

All installations must adhere to recognized standards using reliable design methods and materials.

*b. Preparation of designs and supervision of works*

Preparation of designs including supervision of landscaping works during the building construction phase shall be carried out by a registered licensed professional (landscape architect) as per provisions of paragraph 6 of the Code.

### 2. Landscape design consideration

329. (1) An owner shall provide for a soft landscape at the construction site when engaging in construction works.

(2) The soft landscape referred to in sub-paragraph (1) shall be at least fifty percent of the open area of a construction site when engaging in construction works.

(3) The design of the soft landscape referred to in sub-paragraph (1) shall be prepared by an architect.

### 3. Provision for tree or shrub

331. (1) A tree planted shall be in accordance with that specified in Table 49, Table 50 and Table 51 set out in the First Schedule of the Code, except where a special construction mitigation measure has been put in place for a root barrier.

### 4. Minimum size of tree and shrub

332. (1) A deciduous tree planted shall have a minimum calliper of 50mm and a coniferous tree shall have a height of 2m.

(2) A person may plant a mix of deciduous and coniferous trees, where practicable.

(3) If a proposed tree has a calliper that is less than 50mm, additional plant material may be planted.

(4) Minimum shrub spacing shall be based on spread at maturity.

(5) With the exception of a naturalization area, shrub size at planting shall be a minimum of 300mm height for deciduous shrubs and a spread of 450mm for coniferous shrubs.

## PART XVIII - NON-WATER BORNE WASTE DISPOSAL

This part comprises of paragraphs 338 - 343 of the Code.
The provisions outlined provide standards for design, building materials, products and systems for non-water borne waste waste disposal.

### 5.1 Key points

**1. General**

*a. Design Standards*

All installations must adhere to recognized standards using reliable design methods and materials.

*b. Preparation of designs and supervision of works*

Preparation of designs including supervision of works during the building construction phase shall be carried out by registered licensed professional as per provisions of paragraph 6 of the Code.

**2. Prohibition of pit latrines**

339. (1) A person shall not construct a pit latrine in an urban area unless approved by the approving authority.

(2) Notwithstanding subparagraph (1) a temporary latrine shall be constructed at a construction site in accordance with the Public Health (Drainage and Latrine) Rules.

**3. Siting of a pit latrine**

342. (1) An excavation for a pit latrine shall not be situated within 3m of a building, or of a boundary.

## PART XIX - REFUSE DISPOSAL

This part comprises of paragraphs 344 - 351 of the Code.
The provisions outline provide for standards for design, building materials and products for refusal disposal.

### 6.1 Key points

**1. General**

*(a)Design Standards*

All installations must adhere to recognized standards using reliable design methods and materials.

*(b) Preparation of designs and supervision of works*

Preparation of designs including supervision of works during the building construction phase shall be carried out by a registered licensed professional as per provisions of paragraph 6 of the Code.

**2. Provision for refuse disposal**

344. (1) Every building shall have an approved means of refuse storage and disposal.

**3. Waste container for building.**

346. (1) In a low-rise residential building, a dwelling shall have, or have access to, a movable waste container with a capacity of at least 0.125m3, or a communal waste container of a capacity that is between 0.75 m3 and 1m3.

(2) In a multi-storey residential building, each dwelling up to the fourth storey may have its own waste container, or share a waste container.

(3) In a multi-storey residential building, a dwelling that is situated above the fourth storey shall share a container that is fed by a chute.

(4) Where the siting or operation of the chute referred to in sub paragraph (3) is impracticable, a management arrangement for conveying refuse to the waste container shall be provided.

(5) A waste container shall have a close-fitting lid.

(6) If a waste container is placed in an enclosure, the enclosure shall—
(a) allow room for filling and emptying;
(b) provide a clear space of 150mm between and around the container and if it is a communal container, have a height of at least 2m; and
(c) be permanently ventilated at the top and at the bottom.

## 7.0 PART XXIV- ACCESS ROADS, CUL-DE-SACS AND OTHER PRIVATE ROADS

This part comprises paragraphs 496 - 516 of the Code.
The provisions outline in this part provides standards for design, building materials and products for access roads and cul-de-sacs.

## 7.1 Key points

**1. General**

*a. Design Standards*

All installations must adhere to recognized standards using reliable design methods and materials and products.

*b. Preparation of designs and supervision of works*

Preparation of designs including supervision of works during the building construction phase shall be carried out by a registered licensed professional as per provisions of paragraph 6 of the Code.

**2. Private road**

496. (1) A private road or cul-de-sac shall be accessible from an existing road or another new road.

**3. Footpath**

497. (1) A private road or cul-de-sac shall have a footpath of a width of at least 2m on either side.
(2) An access road shall have a footpath on at least one side.
(3) A private road, cul-de-sac and an access road shall have a safe cyclist lane

and designated parking spaces.

(4) A footpath shall be protected in such a manner as to prevent vehicles entering thereon and well drained.

(5) A footpath shall be surfaced with concrete that is at least 50mm thick, and covered with granolithic paving that is at least 12.5mm thick or any other approved design.

**4. Width of private road or cul-de-sac**

498. (1) In a residential area—

- the width of a carriageway and footpath in a private road shall be at
- least that specified in Table 76 set out in the First Schedule of the Code; and
- the width of a carriageway of a cul-de-sac shall be at least 5m and
- the width of each footpath thereon shall be at least 2m.

(2) In an industrial area—

- the width of a carriageway or footpath in a private road shall be at least that specified in Table 76 set out in the First Schedule; and
- the width of a carriageway of a cul-de-sac shall be at least 7m and the width of a footpath thereon shall be at least 2.75m.

**5. Shape of manhole cover**

514. (1) The cover of a manhole in a private road, cul-de-sac or access road, pedestrian way or service lane, provided for a drain or sewer for the carriage of foul water shall be rectangular.

(2) The cover of a manhole for a drain or sewer for the carriage of surface water shall be round.

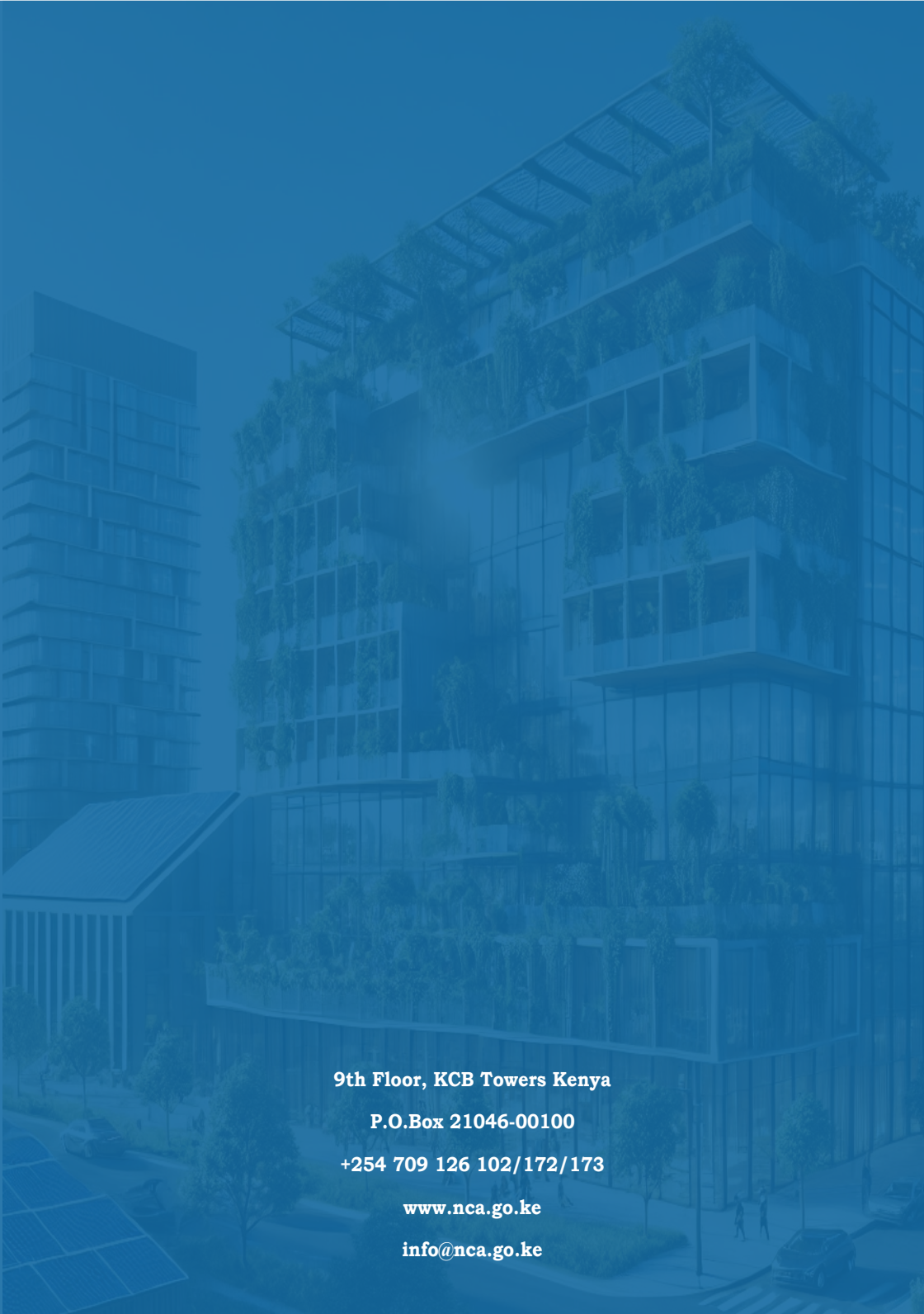
**6. Drainage of private road**

515. (1) A private road, cul-de-sac, access road, footpath or service lane shall have channels, drains and sewers for the carriage of rain-water and surface water to a storm water drain.

**7. Channel in private road**

516. (1) A channel in a private road, cul-de-sac, access road or footpath shall be —

- constructed of concrete that is at least 150mm in thickness and at
- least 300mm in width, or any other approved material;
- laid to a fall of at least 1 in 30 towards the kerb at the cross section;
- and
- (c) laid to a fall of at least 1 in 100 at the longitudinal section.



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