CES 648

Compulsory Ethiopian Standard

First Edition

Bike Dock Stations - requirements

ICS: 43.040

Published by Institute of Ethiopian Standards

Foreword

This Ethiopian Standard has been prepared by the Technical Committee for Road Vehicles (TC 54) approved by the National Standardization Council and published by the Institute of Ethiopian Standards (IES)

In preparing the working draft, relevant technical information source documents including recommendations Abased on research findings have been presented to ESI by Addis Ababa Transport Bureau (AATB)

Acknowledgment is made to AATB for its efficient and effective collaboration with ESI and for its unreserved effort in achieving the desired outcome, developing this standard

Bike Dock Stations - requirements

1. Scope

This Ethiopian standard specifies the requirements for bike dock stations, which apply to:

- Public and semi-public bike docking facilities
- Conventional bicycles and e-bikes
- Locations both on-street and off-street, as well as transit-integrated areas for bike-sharing systems that prioritize safety, reliability, comfort, sustainability, and environmental friendliness.

2. Normative references

The following Ethiopian Standards contain provisions, which through reference in the text constitute provisions of this Ethiopian Standard. At the time of publication, the editions indicated were valid.

3. Terms and definitions

For the purposes of this document, the following terms and definitions shall apply.

3.1.

Public

Spaces that is openly accessible to all members of the community without restrictions.

3.2.

Semi-Public

Spaces that are accessible to a specific group of individuals, often with some level of control or limitation on entry.

3.3.

Bike Dock Station

A fixed installation where bicycles can be securely parked, rented, or returned.

3.4.

Dock

A physical locking mechanism that secures a bicycle.

3.5.

User Interface (UI)

Any physical or digital interface used by users (screen, keypad, mobile app)

3.6.

Operator:

Organization responsible for managing the bike dock system.

4. General Requirements

4.1. Bike-Dock station shall

4.1.1 Be easily accessible

4.1.2 have enough Space & Layout

4.1.3 have compatible Dock Design

4.1.4 be made of Weather resistant material

4.1.5 have different Capacity based on demand and location analysis

4.1.6 have Optional Smart Features

4.1.7 have Safety & Security features

4.1.8 have Environmental & Comfort Features

4.1.9 have Docking & Locking System

4.1.10 have Connectivity features

4.1.11 be Compatible with different bike sizes and types

4.1.12 be Fixed dock or smart dock (with locking mechanism)

4.1.13 be Compatible with local urban transport design

4.1.14 Have Drainage to prevent water accumulation

4.1.15 Have minimum clearance maintained from roads and pedestrian paths.

4.1.16 Compatibility with smart city platforms

4.2 Bike-Dock station Should have Canopy or shelter for public docks

4.3 Bike-Dock station shall have charging facilities

4.4 Safety Requirements

4.4.1 Bike Dock Stations shall not obstruct pedestrian walkways, emergency exits, or vehicle sightlines.

4.4.2 All edges and surfaces shall be treated to prevent injury.

4.4.3 Electrical components shall comply with national electrical safety standards.

4.4.4 Adequate lighting shall be provided for night time use.

4.4.5 Bike Dock Stations shall have fire and emergency exit access.

4.4.6 Bike dock station shall

4.4.6.1 Be secured and durable

4.4.6.2 Have secured authentication protocols

4.4.6.3 Have a mechanism to Detect bike presence and lock status

4.4.6.4 Have Protection mechanism against unauthorized access

4.5 Accessibility Requirements

4.5.1 Bike dock Stations shall comply with design standard principles.

4.5.2 Clear access paths shall be provided for users, including persons with special needs.

4.5.3 Controls and displays shall be positioned at accessible heights.

4.6 Environmental Requirements

4.6.1 Materials shall be weather-resistant, corrosion-resistant, and UV-protected.

4.6.2 Bike dock station shall have a mechanism to minimize noise and visual pollution

4.6.3 Bike dock station components shall be Energy-efficient

4.6.4 Bike dock station shall have non-slip surface

4.6.5 Bike dock station shall have landscaped with Green integration

4.6.6 Operating temperature shall be –5°C to +55°C

4.7 Regulatory and Compliance Requirements

4.7.1 bike dock Stations shall comply with local building codes and urban planning regulations.

4.7.2 bike dock Stations design shall consider Traffic and pedestrian safety regulations.

4.7.3 bike dock Stations shall consider users' data protection and privacy laws

4.8 Operational Requirements

4.8.1 Bike dock Station should support 24/7 operation.

4.8.2 Clear instructions for use shall be displayed in appropriate local languages.

4.8.3 System uptime shall meet minimum availability targets (≥ 95%).

5. Specific Requirements

5.1 Bike dock station shall

5.1.1 be located near high-demand areas but not limited to transit hubs, schools, business districts, parking lots public libraries, streets, Community centers, educational institutions, corporate buildings, or facilities that require membership for access.

5.1.2 Have ground surface level and capable of supporting structural loads.

5.1.3 be Barrier-free access.

5.1.4 be Close to pedestrian routes but not blocking walkways or emergency access.

5.1.5 be easily seen from the street.

5.1.6 have enclosure IP 65

5.2 Structural and Mechanical Requirements

5.2.1 Docking units shall securely lock bicycles to prevent theft.

5.2.2 The structure shall withstand vandalism and moderate impact loads.

5.2.3 Fasteners and anchors shall be tamper-resistant.

5.2.4 Docking units shall Supports bike without putting stress on wheel

5.2.5 Docking station shall Accommodates a variety of bicycles.

5.3 Electrical and Power Requirements

5.3.1 Stations serving e-bikes shall provide regulated charging capability.

5.3.2 Power supply shall include surge protection.

5.3.3 Solar power may be used where feasible.

5.3.4 Bike dock station shall have grid connection with battery backup

5.3.5 Electrical installation and components shall comply with CES 162

5.4 User Interface and Technology Requirements

5.4.1 Bike dock station should support card-based, mobile app, and/or QR-code access.

5.4.2 Displays shall be readable in daylight and nighttime conditions.

5.4.3 Bike dock station System should provide real-time availability status.

5.4.4 Bike dock station should be Integrated with digital payment system

5.5 Security Requirements

5.5.1 Anti-theft locking mechanisms should be integrated.

5.5.2 CCTV coverage shall be provided in high-risk locations.

5.5.3 System logs should record docking and release events

5.6 Maintenance Requirements

5.6.1 Stations shall allow easy access for inspection and repair.

5.6.2 Preventive maintenance schedules shall be defined.

5.6.3 Spare parts shall be standardized and readily available.

5.7 Signage and Information Requirements

5.7.1 Station identification signage shall be clearly visible.

5.7.2 Instructions, pricing, and contact information shall be displayed.

5.7.3 Safety and emergency notices shall be included.

6. Installation Requirements

6.1 Installation shall be performed by licensed personnel.

6.2 Anchoring shall not damage underground utilities.

6.3 Final inspection and testing shall be conducted and approved by an authorized body before commissioning.

7. Testing and Acceptance

7.1 Functional testing of all docks and interfaces shall be conducted and approved by an authorized body.

7.2 Electrical safety tests shall be conducted and approved by an authorized body

8. Smart Features

8.1 Bike dock station Shall have control center
8.2 Bike dock station Shall have Power monitoring and low-battery alerts

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INSTITUTE OF ETHIOPIAN STANDARDS

Organization and Objectives

The Institute of Ethiopian Standards (IES) is the national standards body of Ethiopia. IES is re-named by the proclamation number 1263/2021, from Ethiopian Standards Agency (ESA) to Institute of Ethiopian standards, with the mandate given by the regulation Number, 193/2010 and proclamation number, 1263/2021.

IES's objectives are:

- Develop Ethiopian standards and establish a system that enable to check whether goods and service are in compliance with the required standards,
- Facilitate the country's technology transfer through the use of standards,
- Develop national standards for local products and services so as to make them competitive in the international market.
- Conduct standards related research and provide training and technical support.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational and research institutes, governmental organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/ or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.

Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices). A catalogue of Ethiopian Standards is also available freely and can be accessed from our website.

 International Involvement IES, representing Ethiopia, is a member of the International Organization for Standardization (ISO), International Electro-technical Commission (IEC) and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

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