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STANDARD**

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186-3**

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**Fire safety for buildings — Code of  
practice —**

**Part 3: Fire safety in public buildings**

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In order to match with technological development and to keep continuous progress in industries, standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

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## Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 186-3 was prepared by Technical Committee RSB/TC 28, *Fire safety*.

In the preparation of this standard, reference was made to the following standard:

IS 1641:1988; *Code of practice for Fire Safety of Buildings (General): General Principles of Fire Grading and Classification*

The assistance derived from the above source is hereby acknowledged with thanks.

This third edition cancels and replaces the second edition (RS 186-3: 2018), Clause 1 and Clause 7 which have been technically revised.

DRS 186 consists of the following parts, under the general title *Fire safety for buildings — Code of practice*:

- *Part 1: General principles of fire grading and classification*
- *Part 2: Details of Construction*
- *Part 3: Fire safety in public buildings*
- *Part 4: Selection, installation and maintenance of automatic fire detection and alarm system*
- *Part 5: Exit requirements and personal hazard*
- **Committee membership**

The following organizations were represented on the Technical Committee on *Fire safety* (RSB/TC 28) in the preparation of this standard.

Bank of Kigali (BK)

City of Kigali

CrossTech

Institution of Engineers Rwanda (IER)

Ministry of Infrastructure (MININFRA)

PRIME Insurance Ltd

Rwanda Defence Force (RDF)

Rwanda Energy Group (REG)

Rwanda Environment Management Authority (REMA)

Rwanda Housing Authority (RHA)

Rwanda National Police (RNP)

Rwanda Social Security Board (RSSB)

Sanlam

Société Rwandaise d'Assurance (SONARWA)

University of Rwanda - College of Science and Technology (UR - CST)

Rwanda Standards Board (RSB) – Secretariat

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# Fire safety of buildings — Code of practice — Part 3: Fire safety in public buildings

## 1 Scope

This Draft Rwanda Standard covers the fire safety requirements in public buildings. Taking into account that absolute fire safety is not attainable in practice, it specifies measures which to be taken to reduce loss of lives and damage properties.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DRS 186-1, Fire Safety for buildings — Code of practice— Part 1: General principles of fire grading and classification

DRS 186-2, Fire Safety for buildings — Code of practice — Part 2: Details of construction

DRS 186-4, Fire Safety for buildings — Code of practice — Part 4: Selection, installation and maintenance of automatic fire detection and alarm system

DRS 186-5, Fire Safety for buildings — Code of practice — Part 5: Exit requirements and personal hazard

RS ISO 11602-1, Fire protection — portable and wheeled fire extinguishers — Part 1: Selection and installation

RS ISO 11602-2, Fire protection — portable and wheeled fire extinguishers — Part 2: Inspection and maintenance

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in DRS 186-1 apply.

## 4 Aspects of fire safety

Fire safety should be achieved by considering the following aspects:

- a) management responsibility;
- b) containment of smoke or fire;
- c) provision of safety escape routes;

- d) fire safety and detection, and alarm system;
- e) emergency power and lighting; and
- f) provision of fire safety or fighting equipment

## **5 Accessibility to the public building and evacuation**

**5.1** The requirements of width and hardness of approach roads to provide access to fire engines, open spaces, parking distance from roads shall be in accordance with the relevant provisions of road construction codes or Rwanda standards.

**5.2** The exit and doors requirements for accessibility should be done in compliance with requirements of RS 186-5.

**5.3** The evacuation planning requirements including evacuation/escape routes, location of evacuation plans and signs should be in compliance with relevant national building codes.

## **6 Management responsibility**

**6.1.1** Building Management shall ensure compliance of fire safety requirements according to relevant national fire codes.

**6.1.2** Building Management shall issue a written statement of its policy regarding fire safety and fire loss control to its employees as well as its guests (see Annex A).

**6.1.3** Building Management shall provide communication means for portraying information of various fire precautions including but not limited to:

- a) use of gas mask;
- b) location of fire escape routes; and
- c) assembly points evacuation plan, to the occupants at regular intervals.

**6.1.4** For buildings, with number of occupants exceeds 100, Building management shall appoint a permanent fire warden officer in charge of, on behalf of the building management ensuring compliance to this standard.

**6.1.5** A fire control room shall be established on ground floor near the main entrance in accordance with RS 186-4.

**6.1.6** All users should be trained on fire fighting and use firefighting equipment.

**6.1.7** For hotel permanently posted instructions shall be mounted in guest rooms at the inner side of entrance door, or any other prominent location. The instructions shall contain floor map showing the location of the room in question, escape routes to staircases and clear instructions what the guests should do in an emergency.



**6.1.8** Fire safety instructions shall be updated following any modifications in the premises to ensure compliance with relevant standards.

**6.1.9** Management shall ensure that escape routes are not blocked, fire doors are kept in closed position and rags are kept away from flammable products.

**6.1.10** Management shall ensure preventive inspection, testing and maintenance of all fire protection and firefighting systems, machinery and equipment at least every six months.

**6.1.11** Management shall keep certificates of maintenance for Fire protection and firefighting system.

**6.1.12** There shall be instituted a "Hot Work" permit system and "Work" permit system for outside contractors to work inside the building. Such permits shall be requested by the building management on behalf of the contractor and issued in accordance with relevant standards.

**6.1.13** Management shall ensure that furnishing and decoration materials used on escape routes shall have Class I flame spread rating and shall not generate toxic and asphyxiating gases on burning furniture, furnishings and decoration on escape routes shall not be attached or erected so as to:

- a) obstruct access to an exit from any room;
- b) obstruct the use of an escape route;
- c) render invisible or inaccessible notices, signs, communication equipment or extinguishing equipment;
- d) obstruct the movement of the door;
- e) mirrors/reflecting surfaces or hangings shall not be used on any escape route, which may create confusion in the minds of people;
- f) floor and stair coverings, where used shall be firmly fastened so that slipping, tripping or falling of escaping people is avoided; and
- g) floor surface occupancy of the room/office shall at least leave 30 % for free movement.

NOTE stores are not covered

## 6.2 Classification by fire resistance

Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types provided below:

- a) Types I and II: Types of construction in which the building elements are of noncombustible materials. In this type of construction, the building elements are of noncombustible materials such as concrete and steel. The roof is also of noncombustible material such as concrete or steel.

- b) Type III: type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material. It has masonry bearing walls but the floors, structural framework and roof are made of wood or other combustible material.
- c) Type IV: Heavy Timber(HT), is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces.
- d) Type V: Type V - Wood-frame construction is the most combustible of the five building types. The interior framing and exterior walls may be wood. A wood frame building is the only one of the five types of construction that has combustible exterior walls.

## **7 Containment of smoke/fire**

### **7.1 Restriction on spread of fire/smoke**

- 7.1.1** Containment of smoke/fire shall be achieved by fire resistive construction and compartmentation.
- 7.1.2** Wall panels, draperies, furniture and décor shall be such that the flame spread rating shall conform to Class I according to relevant standards
- 7.1.3** List and enclosure, inspection doors, windows, basements and vertical shafts/ducts for installing drainage pipes, plumbing, wiring and cabling shall comply with DRS 186-2
- 7.1.4** Kitchen rooms, laundry, linen stores, furniture storage rooms shall be of fire resisting construction, and shall be provided with one-hour fire resisting self-closing doors.
- 7.1.5** Transformer bays High Voltage Transformer (HV) and Low Voltage Transformer (L.V.) supply rooms, air-conditioning plant systems and boiler rooms shall be in separate fire resisting rooms and shall conform to RS 186-2
- 7.1.6** Special hazards due to Liquid Petroleum Gas shall be in accordance with the provisions of RS 135-2.
- 7.1.7** Air conditioning system shall conform to DRS 186-2 and it shall be further linked with the fire detection system to automatically cut off, the respective floor air handling unit in case of a fire. Also there shall be adequate arrangements of smoke/fire venting and enclosure of service ducts
- 7.1.8** Air-conditioning system, if not properly designed may spread fire and smoke very rapidly throughout the floors, and vertically from floor to floor. As far as possible 'Direct Expansion' system shall not be used.
- 7.1.9** Particular attention shall be given to cross-link the A.C. system with smoke detection system conforming to DRS 186-4 and sprinkler systems, to switch off the system when either smoke detector or sprinklers operate.
- 7.1.10** Fire dampers play positive role in stopping spread of smoke and fire, and shall be installed conforming to DRS 186-2.
- 7.1.11** All electrical equipment including cables, light fittings, gauges, etc shall be in conformity with relevant Rwanda Standards.

## 7.2 Boiler and boiler rooms

Only approved boiler conforming to National, regional or International Standards and meeting the provision of relevant national law shall be installed.

## 8 Means of egress

### 8.1 Staircases

**8.1.1** A means of egress is a continuous and unobstructed way of exit travel from any point in the building to a public way, and consists of three separate and distinct points as given below:

- a) exit access,
- b) exit, and
- c) exit discharge.

**8.1.2** A means of egress comprises the vertical and horizontal travel, and shall include intervening rooms, space doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies horizontal exits, courts and yards.

**8.1.3** Exit requirements in buildings shall fully comply with the provisions laid down in RS 186-5. However, width of corridors and passageways, leading to exit stairways shall not be less than 2 m. Floors on which dance halls, banquet halls, are located, the width of corridors leading to exit from such area shall not be less than 2.5 m for banquets or dance hall having occupants of more than 50 persons, and 2.2 m for such halls accommodating less than 50 persons.

**8.1.4** Basements shall not be used for banquet halls or dance halls, unless one entire side of such basement opens up directly to the open and also such halls including entire basement is fully sprinkled.

All provisions of DRS 186-5 shall be followed in deciding the number and location of staircases in a building.

### 8.2 Illustration of exits and emergency power

**8.2.1** Illumination of exits shall be provided by means of emergency power supply derived from self-contained emergency light or diesel generator

**8.2.2** The floors of exits shall be illuminated at all points including turning points, intersection of corridors and passage ways, staircases, landings, and discharges exit at ground level. The intensity of lighting throughout shall not be less than 10 lux measured at floor level.

**8.2.3** Lights recessed in the walls and floors shall be fixed at 30 cm from the floor level.

**8.2.4** Illumination lights shall be installed such that failure of bulb or connections will not leave any area in total darkness.

**8.2.5** A stand-by power supply shall be provided in a building to cater for emergency in the event of failure of normal power supply such stand-by power supply shall be independent and through a generator/generators of adequate capacity to meet the following minimum requirements:

- a) emergency illumination of all corridors, staircases, basements and exist signage, etc;
- b) fire lifts;
- c) mechanical ventilation for basements or in case of centrally air conditioned building;
- d) fire water pump (however, if a stand-by diesel pump is provided, this may be exempted); and
- e) other emergency automatic systems for firefighting.

## **9 Fire safety/fighting equipment**

All buildings irrespective of height shall have fire detection and suppression systems as given below:

- a) internal hydrant system/hydrant and sprinkler system in accordance with relevant standard;
- b) automatic detection-cum-alarm system in accordance with RS 186-4;
- c) automatic emulsifier/ halon system;
- d) portable fire extinguisher in accordance with RS ISO 11602-1 and RS ISO 11602-2;
- e) efficient public address system to couple with fire alarm or independent of fire alarm system; and
- f) in kitchen hoods and ducts, for fire protection automatic and manual CO<sub>2</sub>/Dry powder extinguisher shall be installed and maintained in accordance with RS ISO 11602-1.

NOTE Condition for application of sprinkler system may be determined according to Rwanda Building code

## Annex A (normative)

### Written policy for fire safety

#### Fire safety policy

We recognize that a major fire could have a devastating effect on our business, Team Members and guests. Fire Safety is, therefore, of paramount importance and, as a minimum, we aim to comply with legislative requirements and relevant Rwanda Standards relating to Fire Safety.

We are committed to taking all reasonable steps to protect our Team Members, guests, visitors and those in the vicinity of our premises from the effects of fire. In doing so we will concentrate on fire prevention measures designed to eliminate or reduce fire hazards in our premises, thereby reducing the likelihood of a fire occurring.

The likelihood of fire can, however, never be totally removed. We will, therefore, also ensure that we have suitable fire protection measures in place, to afford the occupants of our buildings sufficient time to safely evacuate the premises in the event of a fire.

We will take all practical steps to ensure that our Management Teams are provided with the necessary support to effectively manage Fire Safety in the premises under their control. We will also provide the assistance and training necessary for all Team Members to competently fulfil their Fire Safety duties and responsibilities.

By means of the above measures, we will endeavour to ensure the fire hazards in our premises are no greater than would normally be expected and that the risks to life from fire are reduced to a tolerable level.

In return we expect all Team Members to contribute and comply with our Fire Safety procedures. You must ensure, so far as reasonably practicable, that you take care of your own safety, your colleagues' safety and that of anyone affected by what you do or fail to do at work. In addition, you must not interfere with or misuse anything provided in the interests of Fire Safety.

The responsibility for implementing the Fire Safety Policy lies with all Directors, Managers and Team Members. We expect them to plan and organize safe systems of work, maintain records and regularly review Fire Safety performance. These actions will enable us to reduce the likelihood of a fire occurring and minimize the effects in the event that one does.



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