Pursuant to Article 44a of the Law on Fire Protection ("RS Official Gazette", No. 111/09, 20/15 and 87/18),

The Minister of the Interior delivers

RULES

on technical standards for fire protection of residential, commercial and public buildings

RS Official Gazette, No. 22 of March 28, 2019.

I. BASIC PROVISIONS

Article 1.

This ordinance regulates in more detail the special technical norms of fire safety for the construction, upgrading and reconstruction of residential, commercial and public buildings.

In addition to the provisions of this Ordinance, other regulations and standards governing the requirements of fire protection for buildings, parts of buildings, equipment, installations and appliances, as well as special regulations governing fire protection, shall also apply to the facilities referred to in paragraph 1 of this Article. listed facilities according to the specifics of the purpose.

Article 2

If a part of an object referred to in Article 1 of this Rulebook is reconstructed or upgraded, and / or the installations, equipment and devices on those objects, the provisions of this Rulebook shall apply only to a part of the object and / or to installations, equipment and devices that are subject to reconstruction or upgrades.

The reconstruction or upgrading referred to in paragraph 1 of this Article shall not diminish the fire safety of the existing facility.

Article 3

The provisions of this Rulebook do not apply to buildings belonging to the category of high buildings according to a special regulation, floating objects according to a special regulation, catering establishments for food and drink according to a special regulation, as well as to underground parts of the building whose floors for human habitation are located at a depth greater 16 m from the level of the surrounding terrain.

II. DEFINITIONS

Article 4

Some terms and terms used in this policy have the following meanings:

1) the height of the building *H* (m) is the height difference between the carriageway level along the building or the plateau intended for the fire fighting vehicle in case of fire in the building and the floor level of the highest floor occupied by people;

2) basement spaces are spaces whose floor is below the elevation of the terrain at a depth of more than 1 m;

3) above ground floors are basement, ground floor and floors above ground floor;

4) people's stay is housing, work, entertainment, recreation or other stay longer than three hours per week. The upper rooms of duplex apartments, painting studios and similar rooms that are used less are considered as rooms intended for human habitation. Residential pantries, heating substations, rooms for ventilation and air-conditioning chambers, elevators, etc. they are not considered as rooms for people's residence;

5) residential, ie residential and commercial building is a facility that has more than 80% of usable area intended for housing and related facilities (vehicle garages, tenants' storage, heating substation, corridors, stairways, lift windows, etc.) and in which the rest is office space;

6) business, ie business-residential building is a facility that has more than 80% of the usable area intended for business (sale, purchase, services, etc.) and in which other premises are residential and / or public purposes;

7) public purpose building (hereinafter referred to as: public building) means a building which has more than 80% of the useful surface intended for gathering and staying of people (catering establishments for accommodation - except camp, houses and apartments for rent, room for rent, catering facilities for food and drink - except kiosks and similar facilities, educational, health, cultural, sports, religious and similar facilities, buses, railways, air terminals, passenger docks, etc.) and in which other premises are residential and / or business purposes ;

8) separated object is an object that is more than 4 m away from the neighboring object;

9) objects in a row are adjacent objects whose distance is less than 4 m;

10) fire segment is a part of a building that constitutes a construction and functional unit of a building unit that is separated from the other parts of the building by fire-resistant structures;

11) fire sector is a room or set of premises of a facility that can be independently treated for some technical and organizational measures of fire safety (fire and specific fire load, fire alarm zone, automatic fire extinguishing zone, etc.), and is separate from the rest parts of the building with fire-resistant structures;

12) the degree of resistance of an object to fire is an assessment of the behavior of an object against the effect of fire and is expressed by grades I to V, that is, small (I), small (II), medium (III), larger (IV) and large (V);

13) evacuation is the removal of a person from the starting point to a safe place in case of emergency;

14) starting point (PM) is a place where a person can be found at the moment of knowing that such a fire has developed, that evacuation is required;

15) safe place (BM) is a place outside the building away from the exit from the building, where no harmful effects of fire can be expected (flames, smoke, fall of damaged parts of the building, etc.) or a special place in the building constructed in accordance with the regulation the area of safe evacuation of persons is regulated;

16) first exit (PI) is an exit from a room or group of rooms to stay down the hall. This is usually the way out of an apartment, hotel suite or similar group of rooms, classroom, office, etc.

17) floor exit (EI) consists of a door at the exit of the corridor fire-resistant or a fire-resistant door installed at the entrance to the staircase or hall;

18) terminal exit (CI) is an exit from an object intended for evacuation;

19) evacuation speed (ve) is the design value of the speed of movement of persons through the evacuation route;

20) evacuation time is the time of preparation for evacuation and the time of moving from departure point to safe place;

21) progressive horizontal evacuation means evacuation carried out in facilities that are designed and constructed in such a way as to ensure the process of evacuation of persons to the adjacent fire sector on the same floor, in which they are protected and from where they can be evacuated to a safe place;

22) safety lighting is artificial lighting of an object or space or part thereof, added to general lighting to meet the safety requirements of evacuation or the safe completion of a work activity, and automatically switches on in the event of a failure or interruption of the power supply of general lighting.

III. ACCESS TO FIRE VEHICLES

Article 5

Each residential, commercial and public facility must be provided with an access road constructed in accordance with the regulation governing this area.

The access road referred to in paragraph 1 of this Article must always be free and shall not allow the parking and stopping of other vehicles, or the erection of any other obstacles that impede fire intervention.

Article 6

When residential and commercial buildings greater than 9 m in height and public buildings of class P5 or larger are constructed in a block in such a way that they form a courtyard and do not have access from the street side, then entrance to the inner courtyard must be provided for fire trucks in accordance with a special regulation. block.

Parking on surfaces that are in the function of fire intervention is prevented by the installation of obstacles for this purpose and the marking "Road for fire trucks - prohibited parking and restraint".

IV. OBJECT CLASSIFICATION

Article 7

The classification of objects by dominant purpose, separation and height is determined as follows:

1) Residential buildings:

1.1) Separate residential buildings and residential buildings up to 12 m in height (IS1 and NS1);

1.2) Separate residential buildings and residential buildings in a row from 12 m to 22 m in height (IS2 and NS2);

1.3) Separate residential buildings and residential buildings ranging from 22 m to 30 m in height (IS3 and NS3);

2) Business premises:

2.1) Separate business objects and business objects up to 10 m in height (IP1 and NP1);

2.2) Separate business objects and business objects in a row from 10 m to 22 m in height (IP2 and NP2);

2.3) Separate business objects and business objects in a series of height from 22 m to 30 m (IP3 and NP3);

3) Public facilities:

3.1) Separate public buildings and public structures in a row up to 8 m high (IJ1 and NJ1);

3.2) Separate public buildings and public buildings in a row from 8 m to 22 m in height (IJ2 and NJ2);

3.3) Separate public buildings and public buildings in a series of heights from 22 m to 30 m (IJ3 and NJ3).

Residential-commercial or commercial-residential building, within the meaning of this Article, is classified as residential or commercial building depending on the usable surface of the space whose purpose is more dominant.

Article 8

According to the maximum number of occupants of the facility and the largest area of fire sector A, the objects are classified into classes of designation P in accordance with Table 1.

Table 1.

Face number	to 20	21 to 50	51 to 100	101 to 300	301 to 700	701 to 1500	1501 and more
Area of fire sector A [m^2]	≤ 400	400 up to 800 *	800 up to 1200 *	1200 up to 1600 *	1600 up to 2000 *	2000 up to 2500 *	>2500
Object class P	N 1	P 2	P 3	P 4	P 5	P 6	P 7

Note: * indicates that this value is included.

Class P in Table 1, determined by number of persons, is adjusted by adopting the first higher value if the area of fire sector A is larger than the one indicated in the column, and if the area of fire sector A is smaller than that indicated in the column for that number of persons then the same class is retained .

Article 9

Table 2 is used to estimate the number of persons in different purposes.

Table 2.

USE OF THE SPACE	AVERAGE REQUIRED SURFACE AREA FOR ONE PERSON [m^2 / face]
auxiliary and technical rooms	28,0
airport terminal baggage claim luggage processing Hall waiting rooms	1,9 28,0 9,3 1,4
gathering facilities playrooms (gambling machines) exhibition galleries and museums	1,0 2,8
meeting facilities with fixed seats	based on the number of seats
assembly facilities without fixed seats concentrated space (only chairs with unfixed seats) a place to stand unconcentrated space (tables and chairs)	0,65 0,46 1,4

bowling alley (5 persons allowed per track including 4.5 m of landing ground and additional spaces)	0,65
business premises	9,3
courtrooms - except for fixed seat parts	3,7
dormitories	4,6
educational facilities classrooms workshops and cabinets	1,8 4,6
practice rooms	4,6
institutional spaces inpatients non-stationary patients sleeping quarters	22,3 9,3 11,1
kitchens, commercial	18,5
library reading rooms book storage spaces	4,6 9,3
changing rooms	4,6
trade facilities storage and delivery facilities	5,6 28,0
the garage	18,6
residential buildings	18,6
ice skating rinks and swimming pool the surrounding area of the rink and the pool	4,6 1,0
stage	1,4
warehouses	46,5

The maximum number of persons in the space or object shown in Table 2 is determined on the basis of the floor area of the room (total floor area or free floor area) or the dedicated part of that room and the data on the average floor area required for one person [m^2 / face].

The total floor area of the room does not include niches used to accommodate cabbage equipment (eg pizza ovens, refrigerators, freezers, cabinets and shelves), or floor areas intended to be stacked more than 1 m in height.

V. DEFINITION OF FIRE FACILITY

Article 10

The degree of fire resistance of an object is determined for the object as a whole or the fire segment of the object according to Table 3, and in accordance with Art. 7, 8 and 9 of this Rulebook, depending on the purpose, separation of the building, height of the building, maximum area of the fire sector and maximum number of persons residing in that facility.

Table 3.

Object class	IS1	HC1	IS2	HC2	IS3	HC3	IP1	NP1 IJ1	IP2 NJ1	NP2 IJ2	IP3 NJ2	NP3 IJ3	NH3
	The degree of resistance of the object to fire												
P1	II	II	III	III	III	IV	II	II	II	III	III	IV	IV

P2	II	III	III	III	IV	IV	II	II	III	III	IV	IV	IV
P3	III	III	III	IV	IV	IV	II	II	IV	IV	IV	IV	IV
P4	III	III	IV	IV	IV	IV	III	III	IV	IV	IV	IV	V
P5	IV	IV	IV	IV	IV	IV	III	III	IV	IV	IV	V	V
Q6	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	V	V	V
A7	IV	IV	IV	IV	IV	IV	IV	IV	IV	V	V	V	V

Article 11

The fire resistance requirements of structural members depending on the degree of fire resistance of a building (SOP) are set out in Table 4.

Table 4.

ELEMENTS OF CONSTRUCTION	POSITION	FIRE RESISTANCE TO THE ELEMENTS OF THE STRUCTURE DEPENDING ON THE ADOPTED SOP [h]				
		I insignificant	II little	III medium	IV bigger	V great
Carrying a wall	Within the fire sectors	1/4	1/2	1	1,5	2
Pillar		1/4	1/2	1	1,5	2
Beam		-	1/4	1/2	1	1,5
The floor joists		-	1/4	1/2	1	1,5
Non-bearing wall		-	1/4	1/2	1/2	1
Roof construction	/	-	1/4	1/2	1	1
Wall	At the borders of the fire sector	1/4	1	1,5	2	2
The floor joists		1/4	1/2	1	1,5	2
Door area up to 3.6 m^2		1/4	1/4	1/2	1	1,5
Doors with an area greater than 3.6 m^2		1/4	1/2	1	1,5	2
Evacuation pathway / evacuation corridor	/	1/4	1/2	1/2	1	1,5
Facade wall	Exterior structures	-	1/2	1/2	1	1
Roof cover		-	1/4	1/2	3/4	1

If the facility or fire segment as a whole is equipped with a stable fire extinguishing installation, the projected degree of fire resistance may be reduced from V to IV or from IV to III.

Demonstration of the fulfillment of the fire protection requirements for the elements of building structures determined by this ordinance shall be performed in accordance with the provisions of the regulations governing this area, and upon completion of works shall be determined on the basis of certificates of conformity which are regulated in accordance with special regulations.

The walls at the border of the fire sector and the walls of the evacuation corridor must be derived from construction products of the fire response characteristics of at least class A2s1d0 according to the standard SRPS EN 13501-1.

The façade walls must meet the requirements regarding the fire response characteristics in accordance with a special regulation governing the fire safety area of the exterior walls of buildings.

In the composition of the curtain wall in respect of systems or individual system components in structures of classes IS3, NS3, IP3, NP3, IJ3, NJ3, construction products must be applied with the minimum fire reaction characteristics A2 according to SRPS EN 13501-1, except for sealing elements which must have reaction characteristics to at least Class E fire.

In the composition of the curtain wall in respect of systems or individual system components in structures not covered by paragraph 6 of this Article, construction products with a minimum fire reaction B characteristic according to SRPS EN 13501-1 shall be applied, except for sealing elements which must have fire reaction characteristics at least class E.

An insignificant component of the glazed fill of the curtain wall is a component having a thickness <1.0 mm and a layer of mass per unit area <1.0 kg / m^2, which is covered on at least one essential component on each side.

The thermal insulation layer of the building over which the curtain wall is installed shall be at least the characteristics of a reaction to fire of class A2 according to SRPS EN 13501-1.

YOU. CONSTRUCTION MEASURES FOR PREVENTING FIRE TRANSMISSION

Article 12

Separation of accompanying contents (garages, catering establishments for food and beverages, warehouses, etc.), which are part of residential, commercial and public buildings, into special fire sectors, shall be carried out in accordance with special regulations governing the construction of these facilities. , whereby elements of the building structure at the border of the fire sector must meet the requirements of the more stringent regulations.

Article 13

Each residential, commercial and public fire department must be accessible via at least one staircase.

The accessibility referred to in paragraph 1 of this Article shall not apply to individually separated premises in the fire sector.

The stairwells of Class IP3, NP3, IJ3 and NJ3 shall be separated from the corridor by fire-resistant walls and doors as elements at the boundary of the fire sector, in accordance with the projected degree of fire resistance of the building.

Access to the lift is not allowed from the staircase space referred to in paragraph 3 of this Ordinance.

The staircase referred to in paragraph 3 of this Article may not be lined with combustible material and no objects or furniture elements shall be allowed in the staircase space.

The construction of the staircase on the evacuation route must be fire-resistant as the construction of the evacuation corridor in accordance with the projected degree of fire resistance of the building.

The door at the entrance to the staircase referred to in paragraph 3 of this Article must be rotary and open in the direction of evacuation.

Article 14

The walls, ceilings and floor coverings of communication spaces belonging to the evacuation corridor shall be fire response characteristics of at least class A2s1d0 according to standard SRPS EN 13501-1.

Wall, ceiling and floor coverings installed on escape routes not covered by paragraph 1 of this Article (eg floor corridors, passages, etc.) and, depending on the evacuation stages, must be fire response characteristics of at least class Bs1d0 and B $_{fl}$ s1, respectively. according to standard SRPS EN 13501-1.

By way of derogation from paragraph 2 of this Article, products of reaction class fire of at least class C and C $_{fl}$ according to the standard SRPS EN 13501-1 may be used in facilities of class IP1 and NP1 .

Article 15

The walls of vertical ducts for installation must be fire resistant for 30 min for buildings with II and III resistance levels, and 60 min for facilities with IV and V resistance levels, unless otherwise specified.

The walls referred to in paragraph 1 of this Ordinance shall be made of construction products of a fire response characteristic of at least class A2s1d0 according to standard SRPS EN 13501-1.

Access openings for installation control must be provided with doors or shutters of the same characteristics as the walls of st. 1 and 2 of this Article.

Vertical installation ducts must be ventilated on the highest floor of the building through an opening with a total area of 5% of the duct cross-sectional area.

Article 16

The roof structure of a building that is separated from the rest of the building by fire-resistant fire-proof floors does not have to meet the fire-resistance requirement of Table 4.

The roofing of an object that cannot be exposed to fire from adjacent structures does not have to meet the fire resistance requirement of Table 4.

Facilities that do not have a ceiling must have a roof covering derived from construction products fire response characteristics of at least class A2s1d0 according to standard SRPS EN 13501-1.

By way of derogation from paragraph 3 of this Article, the use of combustible material in layers of waterproofing is permitted within the composition of a non-combustible roof covering, provided that it is protected by non-combustible construction products on the underside.

Non-load-bearing façade walls that cannot be exposed to fire from the outside do not have to meet the fire resistance requirement of Table 4.

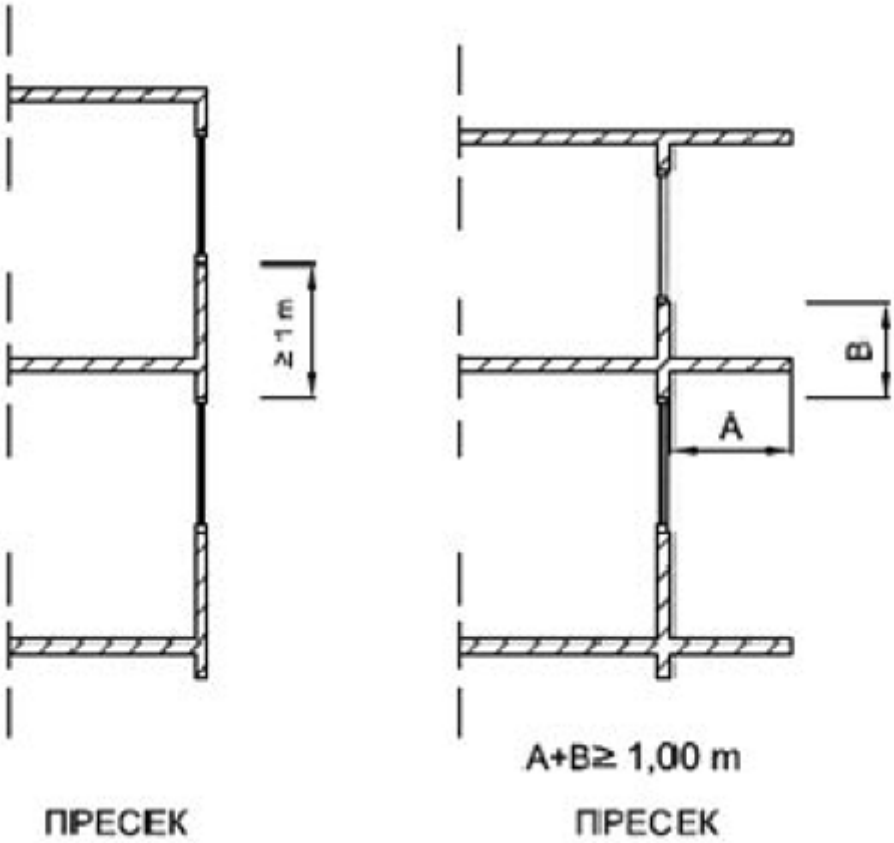
Article 17

The façade (exterior) of the building must be designed to prevent the flame path between the two adjacent floors by performing a vertical building element whose fire resistance is in accordance with the adopted degree of fire resistance of the building, tested according to a special standard for exterior walls or curtain walls.

The height of the vertical building element separating the floors (intermittent distance) must be at least 1 m in length, or at least 1 m in length, which is the sum of the vertical and horizontal parts, as shown in Figure 1.

Exceptional from st. 1 and 2 of this Article, the breaking distance may also be determined by the calculation according to SRPS EN 1991-1-2.

The provision of paragraph 1 of this Article does not apply to stairwells.



Picture 1.

Article 18

Horizontal spreading of fire on the facade at the border of the fire sector is prevented by horizontal intermittent distance by performing at the interface a part of the façade wall, with a total width of at least 1 m, of the same fire resistance as the internal firewall facing it, tested according to special standard for exterior walls or curtain wall.

The horizontal breaking distance referred to in paragraph 1 of this Article may also be achieved in such a way that the internal firewall at the point of contact extends beyond the facade at least 0.50 m.

For complex structures where the fire sectors are joined at an angle equal to or less than 135^0, to prevent horizontal spread of fire from one fire sector to another, a wall of the same fire resistance as the wall at the border of the fire sector shall be constructed at the corner angle 3 m in length, measured from the inner corner at which the fire compartments merge.

Cutoff distances from st. 1, 2 and 3 of this Article are shown in Figure 2.

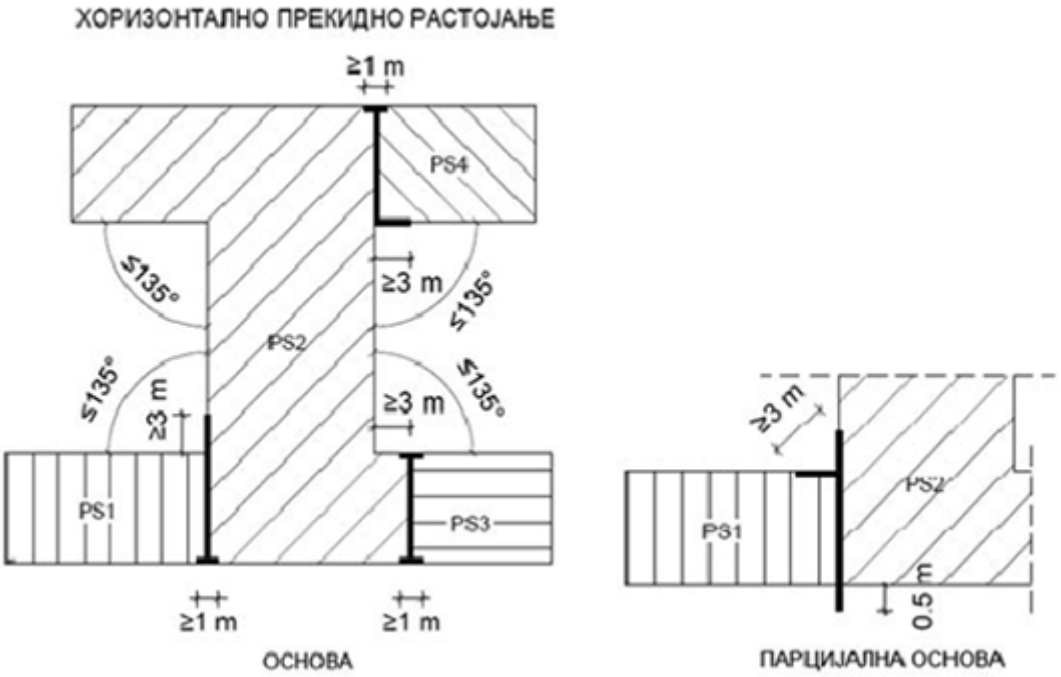


Figure 2.

Article 19

When constructing lean and row structures, measures must be taken to prevent the spread of fire:

1) in the case of leaning objects, the leaning wall of one of the buildings must have a fire resistance at least equal to that of the wall at the border of the fire sector and shall overhang the roof of the adjacent building at least 0.5 m by performing ribs or other technical solutions so as to prevent the spread of fire;

2) the construction of the ribs on the roof of the objects referred to in item 1) of this Article may be omitted if up to the height of the roof covering, the building is divided by a wall of appropriate fire resistance, and the roof covering and its sub-structure are fire resistant in the 5 m zone;

3) the construction of ribs that prevent the transfer of fire through the façade of leaning objects can be omitted if the distance between openings on a flat façade is greater than 1 m;

4) for adjacent leaning objects of different heights, on the wall of the higher part, at least 8 m above the highest point of the lower part, there should be no openings if the openings on the roof of the lower part are less than 4 m from the façade wall of the higher part; an intermediate or roof structure with a lower part roof covering does not have fire resistance from the inside for at least 1 h, as shown in Figure 3;

Figure 3.

5) in the case of objects in a row that are less than 1 m apart, the opposite walls should be without windows or extremely small openings (up to 0.6 m^2) for sanitary facilities and storage rooms.

Article 20

When constructing residential, residential-commercial and commercial-residential buildings, measures must be taken to prevent the spread of fires:

1) objects of long length or leaning objects in a row are separated by fire for a maximum length of 50 m by walls resistant to fire, ribs on the facade and roof protruding from the dimensions of the object at least 0,5 m or by applying other technical solutions so as to prevent the spread of fire ;

2) the construction of the ribs referred to in item 1) of this Article which prevents the transfer of fire through the facade of a larger object may be omitted if the window distance on a flat facade is greater than 1m;

3) the construction of the ribs on the roof of the facilities referred to in item 1) of this Article may be omitted if up to the height of the roof covering, the building is divided by a wall of adequate fire resistance, and the roof covering and its sub-structure are fire resistant in the 5 m zone;

4) buildings with corridors longer than 40 m must be separated by a barrier and a fire resistant door for at least 60 minutes;

5) in buildings, the apartment is separated from the adjacent apartments, business and other premises, walls and floors with fire resistance for 90 minutes;

6) common tenancies, garbage dumps, etc. must be segregated into special fire compartments with fire-resistant construction elements for 90 min.

Article 21

When constructing hotels and other accommodation establishments, measures must be taken to prevent the spread of fires:

1) storage, technical and auxiliary premises (laundry, drying room and laundry room, cold store, etc.) must be separated into special fire sectors;

2) the part of the building in which there are rooms or apartments, with a maximum of 100 persons, must be allocated to a separate fire sector;

3) for buildings with a height H ≥ 22 m, the accommodation part of the hotel must be allocated to a separate fire sector in compliance with the requirements from item 2) of this Article. The internal stairways of this part of the building must be separated from the corridor by fire-resistant walls and doors as elements at the boundary of the fire sector, in accordance with the projected degree of fire resistance of the building.

Article 22

When constructing clinics, hospitals and residential care facilities, measures must be taken to prevent the spread of fire:

1) clinics, hospitals and institutions for the accommodation of the elderly may be maximum height 22 m;

2) facilities with height H ≥ 16 m and H ≤ 22 m are constructed so that only employees of administration, research, etc. can be located on floors above 16 m, and the hospital for patients and the elderly and ambulances must be located on floors with height H < 16 m;

3) ambulances coming to severely displaced persons must be located on a floor that meets accessibility standards;

4) banners, corridors and aisles through which beds with lying patients are transported must have a width of at least 2.8 m;

5) inpatients housing patients and the elderly must be segregated into fire compartments that cannot cover an area of more than 1000 m^2 ;

6) technical premises (boiler room, diesel generator set, battery room, inverter plant, hydro-station, laundry, etc.) must be separated into special fire sectors.

Exceptionally, when the provisions of the regulations governing progressive horizontal evacuation are applied to particular floors or buildings, then the provisions of paragraph 1, subparagraph 1, apply. 1), 2), 4) and 5) of this Article may be implemented in accordance with these regulations.

Article 23

When constructing shopping malls, measures must be taken to prevent the spread of fires:

1) storage, technical and administrative premises must be separated into special fire sectors in relation to the sales area;

2) one or more outlets with a total area of 2,000 m^2 on one storey floor must be separated from the other outlets by fire resistant walls as elements within the fire sector, in accordance with the projected degree of fire resistance of the building;

3) the width of the corridor or the distance between the opposite bars should not be less than 6 m;

4) the premises within the multi-storey shopping center must be separated from the other outlets by fire resistant walls as elements within the fire sector, in accordance with the projected degree of fire resistance of the building.

When the facility referred to in paragraph 1 of this Article has installations and devices for automatic detection, reporting and extinguishing of fires and installations for smoke and heat removal, the total area of the premises referred to in paragraph 1, item 2) of this Article in the facility may be increased up to 4,000 m^2.

Article 24

When constructing theaters, cinemas, conference rooms, amphitheaters and other venues with scenes and fixed seats, measures shall be taken to prevent the spread of fires:

1) in theaters receiving more than 300 persons, the following must be singled out in the special fire sectors: stage space, theater, administrative and technical staff, storage rooms for decor, scenery, etc., workshops and technical rooms;

2) cinema halls, conference rooms, amphitheaters and other venues which have scenes and fixed seats, and which accommodate more than 300 persons, must be allocated to a separate fire sector;

3) cinema halls, conference rooms, amphitheaters and other spaces that have scenes and fixed seats, and are located in an object of other purpose, must be separated from each other and in relation to the rest of the object in special fire sectors.

Theater stages larger than 100 m^2 or whose height, measured from the lowest point of the stage floor to the highest ceiling or ceiling above 15 m, must have smoke and heat extraction installations.

Theater of theaters, cinema halls, conference rooms and amphitheaters and other venues which have scenes and fixed seats, and accommodate over 500 spectators, must have installations for smoke and heat extraction.

The total bright area of the smoke control opening shall not be less than 3% of the floor area of the room and shall be determined by calculation.

Article 25

When constructing museums, archives and large libraries, measures must be taken to prevent the spread of fires:

1) museum and archive depots and technical premises (boiler room, heat substation, etc.) must be separated into special fire sectors;

2) the Department of Conservation and Restoration, the Rare Book Library and the Administrative Block must be segregated into special fire departments;

3) the exhibition space is divided into fire sectors with an area not exceeding 2,000 m^2.

Article 26

When constructing sports halls and mixed-use halls (eg fair halls, etc.), measures must be taken to prevent the spread of fires:

1) Sports halls for more than 300 visitors, together with evacuation routes, are separated into the fire sector in terms of administrative and technical facilities;

2) the seating arrangement in the sports hall must meet the conditions defined in Article 28 of this Rulebook or another technical solution may be implemented providing efficient evacuation of persons in the manner determined by special regulations governing the construction of this type of facilities.

Article 27

When constructing facilities for preschools, schools and colleges, measures must be taken to prevent the spread of fires:

1) pre-school facilities can be built with a maximum of one floor, and if the space for children in the crib is placed on the floor of the facility, additional measures of fire safety and safe evacuation must be provided;

2) primary schools are constructed with a maximum of two floors, secondary schools with a maximum of three floors, and faculties not exceeding 30 m in height;

3) classrooms, classrooms and similar premises in which primary and secondary school students reside cannot be in underground floors;

4) schools and colleges with more than two floors, the length of the site exceeding 35 m must have at least two stairways at least 25 m apart;

5) Chemical and similar laboratories (one or more in the block) of the faculty are singled out as fire sectors.

Article 28

Requirements for passages between rows, blocks of seats, distances of first exits and several other measures for theaters, cinemas, conference rooms, amphitheaters and other spaces that have scenes and fixed seats are given in Figure 4.

If the door at the first exit is double-leafed, it must be at least 1.8 m wide.

The distance between the doors of the first exits must be greater than 12 m.

There can be a maximum of 28 seats in one row and the first row in the row relative to the wall must be at least 1.2 m apart and at least 1.6 m relative to the lateral row of other seats.

The distance between the rows of fixed seats *p* [cm] represents the horizontal distance measured from the seat folded in the seating position to the seatback in front and calculated as follows:

$$p \geq 35 + N/2$$

wherein:

N - number of "connected" seats in that row.

The row of fixed seats where there is a passage on one side only (for example, the end seat in the row is close to the wall and cannot pass on that side) may be a maximum of 12 seats and the distance between the rows of fixed seats (*p*) is at least 40 cm. .

When the seating arrangement is organized in a different and incompatible form with respect to Figure 4, then, when designing an evacuation budget, equally efficient evacuation routes must be provided.

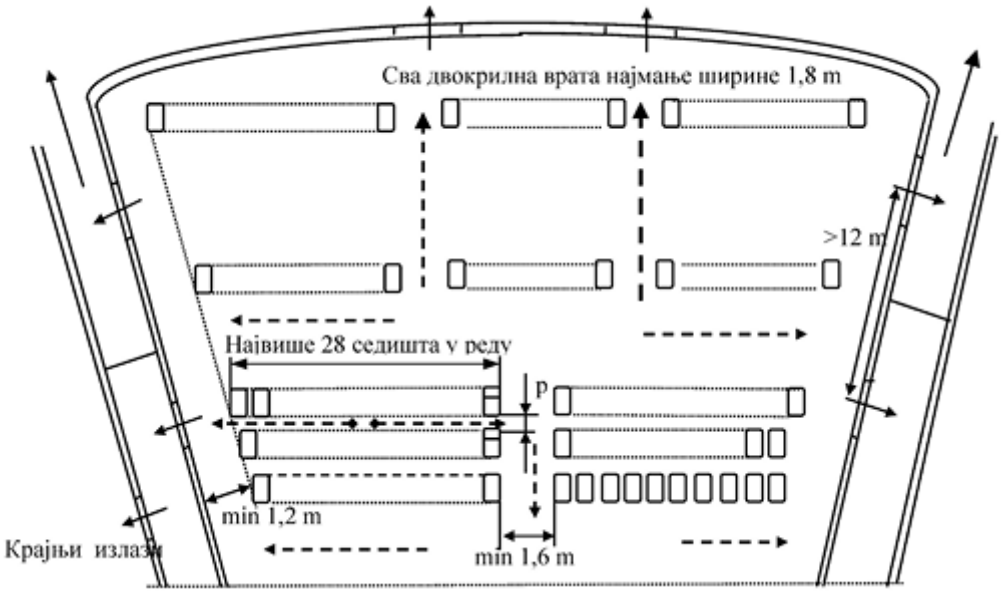


Figure 4.

VIII. EVACUATION ROADS

Article 29

Evacuation routes should be clear, without unnecessary diversion, with direction changes at an angle of not more than 90º (except in the staircase) and without horizontal and vertical obstacles hindering evacuation.

If there are lateral obstacles on the evacuation routes (eg cabinets in the corridor, etc.), then the actual width of the obstacle is subtracted from the actual width of the evacuation floor.

The width of the corridor must not be less than 1.2 m and the width of the staircase should not be less than 1 m. The width of the corridor and stairs required depends on the number of persons to be evacuated.

Article 30

For the calculation of the required number of evacuation exits and their dimensions, an important factor is the specific throughput (SPM), which represents the number of people who pass through a passage or exit of a given width over a period of 1 min.

The SPM value for a given pass width can be adopted as follows:

1) for a width of 0.90 m is 48-62 [persons / m min];

2) for a width of 1.40 m, it is 78-90 [persons / m min];

3) for a width of 1.80 m, it is 98–108 [persons / m min];

Higher SPM values are adopted for children between 5 and 15 years of age, and less for adults with low mobility, people who need assistance in evacuation (young children, the disabled, the visually impaired, etc.).

Article 31

The number of required first exits on the evacuation route is determined as follows:

1) rooms for up to 60 persons must have at least one first exit;

2) rooms for 61 to 500 persons must have at least two first exits;

3) rooms with a capacity of 501 to 1500 persons must have at least three first exits;

4) rooms with a capacity of 1501 to 3000 persons in the facility must have at least four first exits;

5) rooms where more than 3000 persons are staying must have a number of exits in accordance with paragraph 1, item 4) of this Article, with another first exit being made at the commenced next 3000 persons.

Determining the number of required exits from the floor or floor exits (depending on the class of object) in the evacuation route is as follows:

1) a floor with up to 500 persons must have at least one exit;

2) a floor with a capacity of 501 to 1500 persons must have at least two exits;

3) a floor occupying from 1501 to 3000 persons must have at least three exits;

4) the floor occupied by more than 3000 persons must have a number of exits in accordance with paragraph 2, item 3) of this Article, with another exit being performed at the commenced next 3000 persons.

For ground floor facilities, the number of end exits corresponds to the number of floor exits.

Article 32

The length of the evacuation route from the starting point to the first exit for rooms having one first exit may not exceed 20 m.

The length of the evacuation route from the point of departure to the first exit for rooms with more than one exit may not exceed 45 m.

Article 33

The length of the evacuation route from the first to the floor exit may not exceed 30 m in the above ground and 25 m in the underground floors.

For buildings that do not have a floor exit, the length of the evacuation route from the first exit to the staircase is no more than 20 m.

Article 34

Minimum width of bright door openings for apartments, offices, etc. in which up to ten persons reside, it is 0.90 m.

The minimum width of the bright opening of the door of a room occupying more than ten persons and less than fifty persons shall be 1 m.

When double-leaf doors are used to increase the flow of the face, both wings must be opened in the same way only by acting on the locks. This door must be fitted with a device to automatically close the door sequentially.

Door height on all evacuation routes is at least 2 m and in public buildings at least 2,10 m.

For rooms with more than 50 and less than 100 persons double doors or two single doors are used at an adequate distance.

For rooms with more than 100 occupants more double and / or single-leaf doors apply.

Swing doors must be installed at all evacuation exits that open in the evacuation direction.

By way of derogation from paragraph 7 of this Article, in addition to the floor exits, another structural solution of the door may be allowed, provided that it also ensures the safe evacuation of persons, namely:

1) that the door automatically opens with a signal from the fire control panel and remains locked in the open position;

2) have a mechanism to open and remain in a permanently open position when they are switched off;

3) there is a button near the door that can be used to open the door and stay in the open position.

By way of derogation from paragraph 7 of this Article, the doors of the first exit from rooms with up to 20 persons need not be opened in the direction of evacuation.

Article 35

Stairs and theaters in stadiums and sports, concert and similar halls may not have a slope greater than 40º.

Cantilever and spiral staircases are not permitted on evacuation routes.

Article 36

The required width of the stairs, depending on the number of persons using them and the number of floors connected by that staircase, is given in Table 5.

Table 5.

STAIRS CAPACITY									
Number of floors connecting the staircase	Width of staircase [m]								
	1	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8
	Most people use one staircase								
1	150	220	240	260	280	300	320	340	360
2	190	260	285	310	335	360	385	410	435
3	230	300	330	360	390	420	450	480	510
4	270	340	375	410	445	480	515	550	585
5	310	380	420	460	500	540	580	620	660
6	350	420	465	510	555	600	645	690	735
7	390	460	510	560	610	660	710	760	810
8	430	500	555	610	665	720	775	830	885
9	470	540	600	660	720	780	840	900	960
10	510	580	645	710	775	840	905	970	1035

Note: The capacity of staircases serving more than ten floors can be obtained by linear extrapolation of the values in Table 5.

Article 37

External staircases for evacuation may be provided to ensure effective evacuation of persons.

Exterior stairways must be accessible from the common communication space.

Exterior stairs must be:

1) a minimum width of 0.8 m and a bend of up to 45º;

2) made of non-combustible materials;

3) placed at a minimum distance of 1,5 m from the opening on the facade of the building, except when they are protected from the effects of fire from the building;

4) placed in a place protected from rain and snow (due to icing).

Article 38

Evacuation preparation time is the time from when the evacuated person learns that a fire that could endanger life has occurred until the moment they leave the residence (time in which persons evaluate the justification of the evacuation, search for their family members, pets, valuables etc. which they intend to take or carry).

For design purposes, the following is adopted:

1) for residential buildings at least 10 min;

2) for business premises at least 5 min;

3) for public buildings for at least 3 min (except for stadiums and sports halls, for which it is 2 min).

Article 39

The evacuation speed is reduced due to the grouping of persons before narrowing or turning the evacuation route (door, etc.), staircase, escalator, traveler, staircase, ramp, etc.

The design speed of unobstructed face movement on a flat floor is v_o = 1.5 m / s.

The impeded velocity velocity v_e [m / s] is the product of the unobstructed velocity v_o and the deceleration factor *in* :

$$v_e = u \cdot v_o$$

wherein:

1) u = 0.8 to move down the stairs;

2) u = 0.6 - 0.05 d to move up the stairs;

3) u = 0.9 to move down the ramp;

4) u = 0.7 - 0.05 d for ramp movement;

where *d is the* number of fictitious floors of 3 m each.

When approaching an evacuation route, the design dwell time is 3 s for every 10 persons using that evacuation route if:

1) 10 to 40 persons encounter a narrowing of a road or door whose opening is less than 1.00 m;

2) 40 to 200 persons encounter a narrowing of a road or door whose opening is less than 1.60 m.

For each turn at an angle greater than 30º and less than 60º and entering a staircase or ramp, it takes 2 s for every 10 persons using that evacuation route.

Each turn at an angle greater than 60º and approaching the escalator on the move requires an additional 5 s for every 10 persons using that evacuation route.

For each turn at an angle greater than 60º and encountering a traveling traveler, an additional 2 s is required for every 10 persons using that evacuation route.

Article 40

The evacuation stages are as follows:

Stage I - PM to PI (PI is CI for direct exits)

Stage II - PI to EI (EI is usually CI for ground-level structures)

Stage III - from EI to KI

Stage IV - from KI to a safe place.

The movement of a person in the first stage of the evacuation should be completed in 30 s in all residential, commercial and public buildings, except in the cases where they are seated in chairs in long rows and in some specific rooms:

1) cinemas, theaters, amphitheaters for less than 200 persons - 1 min;

2) cinemas, theaters, amphitheaters for more than 200 and less than 600 persons - 2 min;

3) cinemas, theaters, amphitheaters for more than 600 and less than 2000 persons - 3 min;

4) sports and other scenes for more than 2000 persons - 4 min.

The movement of a person in Stage II should be completed in less than 1 min.

The movement of a person in Stage III should be completed in less than 6 min for objects up to 22 m high, or 10 min for higher objects.

For objects that do not have a floor exit of the II stage of evacuation involves movement of persons from PI to CI and then the movement of faces in stage II must be completed in less than 5 min.

Article 41

In the case of objects of specific purpose, in addition to the provisions of this Ordinance, provisions of regulations governing progressive horizontal evacuation may apply, in which case the facility must be designed for that type of evacuation in accordance with the provisions of a separate regulation.

IX. VENTILATION, SMOKE AND HEATING SYSTEMS

Article 42

In business and public buildings, the ventilation and air-conditioning system chambers must be housed in a separate room separated from the other rooms of the building by fire-resistant structural elements for 120 minutes.

Article 43

On the highest part of the staircase used for evacuation, ventilation openings must be installed, with a bright opening area of at least 1 m², which must be opened from the floor staircase of the rear floor. The openings must be such that they remain open at all times necessary for the extraction of smoke and heat, ie. that there can be no self-closure.

In the case where installations and devices for automatic detection and fire detection are foreseen in the facility, the openings referred to in paragraph 1 of this Article shall be automatically opened at the fire alarm signal.

Article 44

Smoke and heat extraction installations and overpressure systems used to create safe evacuation conditions in facilities must be carried out in accordance with the provisions of this regulation and the provisions of the regulations governing the design and construction of these systems.

The chambers of installations, devices and systems referred to in paragraph 1 of this Article must be placed in a separate room separated from the other rooms of the building by fire-resistant structural elements for 120 min.

Article 45

The room for accommodation of boilers and heat generators in the building (solid and liquid fuel boilers, gas boilers, etc.) must meet the following conditions:

1) the walls and the floor structure of the room must be fire resistant for at least 90 minutes;

2) the door at the entrance to the room is installed on the outside of the building, and in the case when the entrance to the room from the door door must be fire resistant for at least 90 minutes;

3) the fuel storage space (solid, liquid or gaseous) must be located outside the facility or in the safe space of the facility.

The fuel storage space (solid, liquid or gaseous) must be outside the premises or in a room separated into a separate fire compartment with horizontal and vertical structural elements resistant to fire for at least 90 minutes.

By way of derogation from paragraph 1 of this Article, boilers and heat generators of power up to 50 kW may be located in other premises of the facility.

When the building envisages the construction of a room for the accommodation of boilers and heat generators, as well as rooms for the storage of fuel for which the technical requirements are laid down by special regulations, then the provisions of the special regulations governing this area shall apply.

When compressed natural gas (KPG) is used as a fuel for boilers and heat generators, the plant components that make it must meet the safety distances in Table 6.

Table 6.

	SOURCES OF DANGER	
	Storage bottles including gas delivery vehicle	Normal vents and vent valves
	SAFETY DISTANCES [m]	
Objects	> 10	> 10
Public Roads	> 5	> 5
The boundary (fence) of the plant	> 2	> 5
Regulatory station	> 2	> 5
Internal roads and footpaths	> 5	> 5
Storage of other types of fuel	> 5	> 5
Access for service	> 2	-

Flammable matter	> 4	> 4

Elements of a compressed natural gas (KPG) plant shall be placed on a concrete plateau in a 2 m high fence and shall comply with the provisions of the special regulations governing this area.

The control station shall be installed within the boundaries of the compressed natural gas (KPG) plant at a distance greater than 10 m from the facilities.

The terms SRPS EN 60079-10-1 shall apply to the concept of explosion hazard zones and sources of danger within the meaning of this Regulation.

Explosion hazard zones that can be created during the normal operation of a natural gas compressed gas (KPG) plant for individual hazard sources are listed in Table 7.

Table 7.

SOURCES OF DANGER	EXPLOSION DANGER AREA	
	Zone 2	Zone 1
	DISTANCES	
Connection of piping with bottles	5 m in radius from the connection	NO
Ends of vent pipelines	15 m vertically, the shape of the compartment with an angle of 60 o	3 m in radius from the ends of the exhaust pipelines

H. ELECTRICAL INSTALLATIONS

Article 46

The high-voltage power plant is installed in a room that represents a special fire sector.

The high-voltage power plant with dry transformers shall be installed in a room separated by fire-resistant structural elements for a minimum of 1.5 h and a fire-resistant door for at least 30 min.

The high-voltage power plant with oil transformers shall be installed in a room separated by fire-resistant structural elements for a minimum of 3.0 h and a fire-resistant door for a minimum of 1.0 h.

Partition walls between rooms belonging to a high voltage power plant with oil transformers for which a fire separation requirement is required shall be fire resistant for at least 2,0 h.

All fire-resistant structural members and doors must be derived from construction products of a fire response characteristic of at least class A2s1d0 according to standard SRPS EN 13501-1.

In order to prevent the spread of fires on the facade at the boundary of the fire sector of a high-voltage power plant with dry transformers, horizontal and vertical cut-off distances shall be provided, in accordance with Art. 17 and 18 of this Rulebook.

In order to prevent the spread of fires on the facade at the boundary of the high-voltage power plant with oil transformers, a horizontal intermittent distance of at least 1 m in width and a vertical interruption distance of at least 2 m or a length equal to the sum of the horizontal and vertical parts at least must be provided. 2 m obtained as shown in Figure 1.

By way of derogation from paragraph 7 of this Article, the vertical breaking distance may be reduced to 1m by installing a stable automatic fire extinguishing system in all premises of the power plant.

Article 47

In addition to the regular electricity supply from the distribution network, the facilities must also provide a backup source of electricity supply for the following devices and systems:

1) safety lighting of evacuation roads (stairs, corridors, signs for faster evacuation, etc.);

2) pressure relief devices in the hydrant network, unless otherwise provided by a special regulation;

3) installations and devices for automatic detection and fire detection;

4) Installation and fire extinguishers.

The power supply to the devices and systems referred to in paragraph 1 of this Article shall be provided for the duration prescribed for the operation of the said systems, and in accordance with the technical regulations governing that type of system, but not less than 30 minutes.

Article 48

In addition to electricity supply to the facility from the distribution network, a safety source must be provided to power the following devices and systems:

1) fire-fighting or evacuation elevators in objects of specific purpose, in which they are intended to be installed;

2) smoke and heat extraction systems and overpressure systems used to create safe evacuation conditions;

3) other systems used to create safe evacuation conditions.

The power supply to the devices and systems referred to in paragraph 1 of this Article shall be provided for the duration prescribed for the operation of the said systems, and in accordance with the technical regulations governing that type of system, but not less than 30 minutes.

Article 49

A backup source for the supply of electricity to the devices and systems referred to in Art. 47 and 48 of this regulation must be placed in a room whose walls, floors and doors are fire-resistant for the duration intended for the operation of the said systems, and in accordance with the technical regulations governing that type of system, but not less than 30 min.

The backup source referred to in paragraph 1 of this Article must be automatically switched on.

The room referred to in paragraph 1 of this Article must be well ventilated and not endangered by explosive atmospheres.

Article 50

Safety lighting or lighting of signs for directing the movement of persons, illumination of evacuation routes, illumination of rooms for the occupation of persons with an area of more than 60 m² (except for residential premises) shall be in accordance with the provisions of standards SRPS EN 1838, SRPS EN 60598-2-22 and SRPS EN 50172, which regulate this area more closely.

Article 51

The electrical distribution of systems, appliances and installations operating in the fire mode must provide electricity for a period defined by the technical regulations governing that type of system, but not less than 30 minutes.

XI. PERSONS

Article 52

The electric elevator drive must be located in a separate room (engine room).

By way of derogation from paragraph (1) of this Article, when the facility provides for the installation of an elevator without a machine room, the elevator drive can be installed in the drive shaft and the control cabinet (control panel) is installed on the highest floor of the facility.

The hydraulic elevator drive must be located in a separate room separated from the other rooms of the building by fire-resistant structural elements of 60min, which must be designed in such a way as to prevent oil leakage from the room by removing the door sill, installing a technological vessel or other technical solution. to keep the entire amount of oil in the case of spills inside the room.

The hydraulic elevator drive room must be ventilated.

Article 53

The walls of the elevator shaft shall be made of construction products with a fire response characteristic of at least class A2s1d0 according to standard SRPS EN 13501-1.

The walls of an elevator window connecting multiple fire compartments or representing the boundary of the fire compartment must have a fire resistance of at least 60 min, and the elevator drive shaft doors must be fire resistant for at least 60 min.

The structure of the building that carries the lift structure must be fire resistant in accordance with the adopted degree of fire resistance of the building.

In the case of the installation of an elevator on the facade of the building, the structure of the building, which is outside the dimensions of the building and bearing the lift structure, must be at least 1 m from the non-combustible construction product and away from the opening on the facade of the building, unless the firewall walls are resistant to fire as supporting the wall in accordance with the adopted degree of fire resistance of the building.

The lift window must be ventilated.

Article 54

The elevator cab and lift car door must be of non-combustible material, the door must be closed automatically and meet the requirements laid down in special regulations for lifts.

Article 55

For objects of class IP3, NP3, IJ3, NJ3 the elevator must be equipped with devices which allow the cabin to be automatically brought to the ground floor in the event of fire and, after leaving the face, the elevator shall be automatically switched off.

Article 56

Specific purpose installations requiring the installation of a fire lift shall meet the requirements of standard SRPS EN 81-72.

The fire lift shall be housed in its own pane and shall have its own anteroom, the walls of which are fire resistant for at least 1.5 hours, derived from construction products fire response characteristics of at least class A2s1d0 according to standard SRPS EN 13501-1.

The doors of the fire escape lobby shall be fire resistant for at least 1 hour.

The fire lift window or its anteroom shall be equipped with a system that produces an overpressure not exceeding 50 Pa ± 10% (the required door opening force not exceeding 100 N) designed in accordance with the requirements of SRPS EN 12101-6, or the fire elevator anteroom shall be ventilated with at least 20 air changes per hour naturally or by force.

The ventilation of the hall must be carried out on all floors, and the overpressure shall be realized on the floor which is endangered by fire, as well as on two floors above and one floor below.

Smoke from the ventilated hallway is vented from the highest place, below the ceiling, and fresh air is introduced into the floor.

The automatic window opening or forced ventilation device is switched on automatically through installations and the automatic fire detection and alarm device.

Activation of the automatic window opening or forced ventilation device must also be ensured manually from a fire safety location.

The cabin of the fire lift to be used for the rescue of injured persons with the aid of a stretcher must be at least 1.1 m by 2.1 m.

The fire lift can also be accessed from a common hall with elevators that do not function in fire conditions.

The doors of the firebox lifts, as well as the lifts doors, which are accessed from the common hall, must be fire resistant for 1 hour.

XII. SPECIAL SYSTEMS AND MEASURES

Article 57

Residential, commercial and public buildings must be provided with an external and internal hydrant network in accordance with a special regulation.

By way of derogation from paragraph 1 of this Article, the following internal hydrant network may not be provided with:

1) residential building, lamellae, which has a height ≤ 12 m;

2) a business or public building with an area of ≤ 150 m^2, with a specific fire load ≤ 360 MJ / m^2 and whose construction is at least of medium fire resistance, unless otherwise specified by a special regulation;

3) business premises at the level of the surrounding terrain with a total surface area of ≤ 150 m^2 and an individual specific fire load ≤ 360 MJ / m^2 entering from the outside, when they are part of a commercial, public or residential building with at least medium resistance , unless otherwise stipulated by a special regulation and if fires in such premises can be extinguished using an external hydrant network.

Article 58

In residential, commercial and public buildings, the required number of mobile fire extinguishers must be provided in accordance with the technical regulations and instructions of the manufacturer of the devices and equipment.

Article 59

This Rulebook shall enter into force on the eighth day after its publication in the Official Gazette of the Republic of Serbia.

01 No. 257 / 19-7

Belgrade, March 19, 2019

Minister,

Dr. **Nebojša Stefanović,** s.r.