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**Bản dịch tiếng Anh TCVN 4319:2012 Nhà ở và công trình công cộng - Tiêu chuẩn cơ bản để thiết kế** (*Public Buildings - Basic rules for design*)

## VIETNAMESE NATIONAL STANDARDS

**TCVN 4319:2012**

**2nd edition**

**PUBLIC BUILDINGS - BASIC RULES FOR DESIGN**

**Bản dịch tiếng Anh TCVN 4319:2012** Nhà ở và công trình công cộng - Tiêu chuẩn cơ bản để thiết kế (*Public Buildings - Basic rules for design*)

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## **Preface**

TCVN 4319:2012 supersedes TCVN 4319: 1986.

TCVN 4319:2012 was changed from TCXDVN 276:2003 in accordance with clause 1 Article 69 of the Law on Standards and Technical Regulations and Point b) Clause 1 Article 7 of the Government's Decree No. 127/2007/ND-CP dated August 01<sup>st</sup>, 2007 detailing the implementation of a number of articles of the Law on Standards and Technical Regulations.

TCVN 4319:2012 compiled by Institute of Architecture, Urban & Rural Planning - Ministry of Construction, proposed by Ministry of Construction, verified by General Department of Standards - Measurement - Quality, issued by Ministry of Science and Technology.

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## **Public Buildings - Basic rules for design**

### **1 Scope of application**

This standard is applied to design and construct new or renovated public buildings including medical centers, sports, culture, educational facilities, administrative offices at all levels and other public buildings.

NOTE: Classification of public buildings is taken according to regulations on classification and decentralization of civil, industry and urban technical infrastructure [1].

### **2 References**

The following references are necessary for the application of this regulation. For any reference specifying the year of publication, the stated version is applied. For any reference without the year of publication, the latest version, including amendments and additions (if any) is applied.

TCVN 2622, *Fire prevention and protection for houses and buildings - Design requirements.*

TCVN 2737, *Load and impact - Design standards.*

TCVN 3890, *Fire protection equipment for houses and buildings - Equipment, layout, inspection and maintenance.*

TCVN 4474, *Internal water drainage. Design standards*

TCVN 4513, *Internal water supply. Design standards.*

TCVN 4605, *Thermal engineering - Covering structure - Design standards.*

TCVN 5502:2003, *Domestic water supply - Quality requirements.*

TCVN 5674, *Completion in construction. Construction acceptance.*

TCVN 5687:2010, *Ventilation - air conditioning - Design standards.*

TCVN 5738, *Automatic fire alarm system - Technical requirements.*

TCVN 6160, *Fire protection - High-rise buildings - Design requirements*

TCVN 6161, *Fire protection - Market and Trade Center - Design requirements.*

TCVN 6772:2000, *Water quality. Domestic wastewater - Permitted pollution limit.*

TCVN 7447, *Electrical installation system of buildings.*

TCVN 7505:2005, *Rules for using construction glass - Selection and installation.*

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TCVN 7958:2008, *Protection of construction works - Prevention of termites for new construction works.*

TCVN 9385:2012<sup>1)</sup>, *Lightning protection for construction works - Guidance on system design, inspection and maintenance.*

TCVN 9386-1:2012<sup>1)</sup>, *Earthquake-resistance works design - Part 1: General provision, earthquake impact and regulations for house structures.*

TCXD 16:1986<sup>2)</sup>, *Artificial lighting in civil engineering.*

TCXD 29:1991<sup>2)</sup>, *Natural lighting in civil engineering - Design standards.*

TCXD 230:1998<sup>2)</sup>, *Anti-porous foundation - Design and construction standards.*

TCXDVN 264:2002<sup>2)</sup> - *Houses and buildings - Basic construction rules for the disabled to access into.*

## **3 Interpretation**

### **3.1 Building height**

The height is calculated from the ground elevation of the building under the approved planning to the highest point of the building, including the upper floor or sloping roof.

NOTE: Technical equipment on the roof (antennas, lightning conductors, solar energy equipment, metal water tanks, etc.) are not included in the height of the building.

### **3.2**

#### **Floor height**

The floor height is the distance between the two floors, calculated from the floor below to the next floor.

- 1) Vietnam standards to be issued
- 2) Construction standards and Vietnam construction standards changed into Vietnam standards

### **3.3**

#### **Vertical clearance**

The height from the finished floor surface to the underside of the finished bearing structure or ceiling of that floor.

### **3.4**

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### **Number of floors**

Number of floors of a house includes all floors on and above the ground (including the technical floor, attic floor, upper floor) and semi-basement.

NOTE: The basements are not considered as floors.

### **3.5**

#### **Floor on the ground**

A floor with its floor level is higher than or equal to the ground level under the approved planning.

### **3.6**

#### **Basement**

A floor with more than half of the height is under the ground level under the approved planning.

### **3.7**

#### **Semi-basement**

A floor with half of the height is above or equal to the ground level under the approved planning.

### **3.8**

#### **Attic floor**

A floor located inside the space of the sloping roof where all or part of its facade is made up of a sloped or folded roof surface, in which the vertical wall (if any) is not 1.5 m higher than the floor.

### **3.9**

#### **Technical floors**

A floor for the arrangement of the building's technical equipment. The technical floor can be a basement, a semi-basement, an attic floor or a floor in the middle part of the house.

### **3.10**

#### **Area of use**

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Total working area and service area.

The area of the rooms, the parts are calculated according to the net dimension from the outer plastering layer (including the thickness of the layer of wall lining material) and excluding the area of garbage pipes, chimney, vent pipes, electricity, water pipes, etc. placed in the room or that part.

### 3.11

#### **Working area**

Total area of the main working rooms and auxiliary working rooms.

NOTE: The working area includes the followings:

- 1) The corridor area incorporates classrooms in schools, waiting rooms, playgrounds in hospitals, sanatoriums, theaters, cinemas, clubs, etc.
- 2) Area of broadcasting rooms, management block, electrical panel room, switchboard, secondary room of the stage, presidency, technical room of projector, etc.

### 3.12

#### **Service area**

Total area of lobby, hallway, staircase, toilet area, buffer zone and technical departments.

NOTE: Technical departments are boiler room, pump room, transformer room, rooms for mechanical ventilation equipment, air conditioners, elevator equipment rooms for carrying people and goods.

### 3.13

#### **Structure area**

Total area of walls, partitions and columns calculated on the ground, including:

- Bearing and non-bearing walls;
- Walls and partitions;
- Columns;
- Door and window thresholds of all kinds;
- Underground chimneys, garbage pipes, ventilation pipes, power supply pipes and water pipes (including the tube inner section and thickness of each pipe);

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- The wall recesses, the empty walls between the two rooms are not fitted with doors, with a width of less than 1 m and a height less than 1.9 m.

#### NOTE:

- 1) The structural area of walls, partitions, and columns shall include both plastering and lining layers of the wall.
- 2) The wall recesses, the blank walls between rooms are fitted with doors, from 1.0 m wide or more and 1.9 meters high (from the floor) shall be included in the area of the room.

### **3.14**

#### **GFA of a floor**

Is the floor area within the outer edge of the floor walls. The area of corridor, balcony, loggia and other areas on the floor are also included in the floor area.

### **3.15**

#### **Area of attic floor**

Measured at the floor elevation within the outer edge of the wall of the attic floor.

### **3.16**

#### **GFA of the house (building)**

Is the GFA of all floors, including basements, semi-basements, technical floor and attic floor.

### **3.17**

#### **Building volume**

The volume of the construction area of the house, the area of the floor or room multiplied by the height of the house, floor and room, including the technical floor.

### **3.18**

#### **Red boundary line**

The boundary line delineates the part of the land for the construction of the works and the land area reserved for roads or technical infrastructure works.

### **3.19**



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**Construction boundary line**

The limit line allows the construction of houses and buildings on the land.

**3.20**

**K<sub>1</sub> ground coefficient**

The coefficient shows the useful rate of using the ground. The smaller K<sub>1</sub> coefficient is, the more the useful rate is. The K<sub>1</sub> ground coefficient is calculated by the following formula:

$$K_1 = \frac{\text{Working area}}{\text{Area of use}} \quad (1)$$

NOTE: The K<sub>1</sub> ground coefficient is usually taken from 0.4 to 0.6.

**3.21**

**K<sub>2</sub> volume coefficient**

The coefficient shows the useful rate of using the work volume. The K<sub>2</sub> ground coefficient is calculated by the following formula:

$$K_2 = \frac{\text{House volume}}{\text{Working area}} \quad (2)$$

**3.22**

**Building density**

Net construction density (netto) is the ratio of the land occupy area by the construction works on the total area of the land lot (excluding the land occupy area by the works such as decorative landscaping, swimming pools, outdoor sport grounds (except for tennis courts and sport grounds that are fixed and occupy ground space), aquariums and other architectural objects).

Aggregate construction density (brutto) of an urban area is the percentage of land occupy area of buildings on a total area of the whole land (the area of the whole area includes the yard, green areas, open spaces and areas in which the works are not built inside such land).

**3.23**

**Land use coefficient H<sub>SD</sub>**

Ratio of GFA of the entire building on the land area.

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$$\text{HSD} = \frac{\text{GFA of the entire building}}{\text{Working area}} \quad (2)$$

#### **4 General provision**

**4.1** Design of public buildings must ensure safety, sustainability, proper use, aesthetics, suitable to natural climate conditions and meet the requirements.

**4.2** Public buildings in urban areas while new construction, renovation, refurbishment, upgrades must be in line with the detailed construction planning or urban design approved, comply with construction permits and rules in the local regulations on urban planning and architecture management;

**4.3** It is not allowed to illegally occupy urban space in order to increase the area to use the project.

**4.4** When designing public buildings, it must be based on natural climate conditions, hydrogeological conditions, public service facilities, the ability to build and install, supply materials and use local materials.

**4.5** The height of public buildings depends on the approved planning projects, the nature of the works, the technical requirements and the respectful conditions of each locality to choose accordingly.

**4.6** Public buildings are designed with construction levels according to regulations on classification and decentralization of civil construction works [1]

**4.7** Public buildings to ensure the safety of life, sanitation, ventilation, natural lighting, artificial lighting [2], to ensure fire safety for buildings and structures [3].

**4.8** Public buildings built in areas of earthquakes or on subsidence ground must comply with the provisions of TCVN 9386-1:2012.

**4.9** Where public buildings have large lengths, it is necessary to design subsidence joints. The distance between subsidence joints is not more than 60 m, the distance between the expansion joints is not more than 15 m.

**4.10** The structure and material of settling joints must be based on the location and required to take the proper measures for waterproof, fireproof, heat, resist termite.

**4.11** The outside of the building must not use colors and materials to affect the eyesight and human health, and hygiene and traffic safety requirements.

For new licensed construction works within the area that has been recognized as a cultural heritage, it is necessary to study the appropriate architectural form, use similar materials in colors and materials with regional heritage works;

**4.12** Design and construction of public buildings must ensure for the disabled to access into

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as prescribed in TCXDVN 264:2002.

**5 Requirements for the land and master planning**

**5.1 Requirements for the land**

**5.1.1** The land of public buildings should meet the following requirements:

- a) In consistency with the land use criteria of the approved area;
- b) Reasonable use of land and urban space;
- c) In consistency with the demand for use;
- d) Safety for fire, earthquake and flood prevention;
- e) Gaining the economic, social and environmental efficiency;
- f) In consistency with the level of economic development of each locality;
- g) Cost and energy saving, ensure structural features.

NOTE:

- 1) If there are cultural constructions, historical sites recognized by the State and local authorities, the relevant regulations must be complied with.
- 2) In case there is no detailed planning, it's required approval from competent authorities for the construction of works in vacant areas, new land, renovating or building in the defense area, the area often suffers from floods, etc.

**5.1.2** The construction land of public buildings must be arranged with gardens, trees, car parking and clear functional areas, convenient entry and exit arrangement for use and evacuation in case of emergency.

**5.2 Requirements for master planning**

**5.2.1** The design of the master planning must be based on the utility of each type of work and the technology transfer line for a clear functional subdivision and must comply with the relevant regulations.

**5.2.2** The limited distance allowed from the works to the red boundary line and the construction boundary line is in accordance with the detailed planning and urban design of the area and in accordance with the regulations on construction planning [4].

**5.2.3** The construction site is only constructed close to the red boundary line when the construction boundary line coincides with the red boundary line and is permitted by the construction planning management authority.

**5.2.4** Where public buildings with many people such as cinemas, theaters, cultural centers,

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halls, exhibitions, fairs, besides complying with the relevant regulations, the following requirements must be met:

- a) The site must have at least a side directly open to the street;
- b) The main gate should not be opened directly to the traffic axis;
- c) In the entrance area of the building, it is necessary to have a gathering area for people and vehicles in front of the entrance (referred to as a parking bay). This area is determined according to the demand and scale of the works;
- d) The gate and the part of the barrier adjacent to the two sides of the gate must be deeply set back against the construction boundary line of no less than 4 m.

**5.2.5** Where the public buildings are located on the main traffic routes, the location of the construction entrance must ensure the following requirements:

- a) No less than 70 m from the main traffic crossroads;
- b) No less than 10 m from public bus station;
- c) No less than 20 m from the exit of parks, schools, architectural works for children and the disabled.

**5.2.6** The layout and distance between works must meet the requirements of fire prevention, lighting, ventilation, noise resistance and environmental sanitation and ensure the following requirements:

- a) Layout of architectural works must be beneficial for natural ventilation and lighting;
- b) Good settlement of the relationship between immediate construction and future development, between permanent and temporary construction works;
- c) Convenient for designing technical systems of works, including power supply, water supply, drainage, technical equipment, communication and other technical systems;
- d) Synchronous design of interior, exterior, internal roads, garden yard, gate and barrier and other requirements (if any).

**5.2.7** The installation of technical infrastructure systems such as water supply and drainage pipelines, communication, electricity and gas supply must not affect the safety of the works, and provide measures to prevent the effects of corrosion, subsidence, shock and load causing damage.

**5.2.8** Roads for fire trucks and specialized fire trucks must ensure fire safety regulations for houses and construction works [3].

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**5.2.9** Number of basements in public buildings must be under the provisions in the approved detailed planning of the area and must ensure the following requirements:

- At least 2 ways to and from the basement.
- The slope of the ways to and from the basement is not larger than 15% and must be opened directly outside, independent of the entrance and exit of the building.

**5.2.10** Based on the scale and category of the building, the number of people using the building to calculate the parking lot accordingly. Parking lots can be underground or hidden, inside or outside the building. The standard of a parking space is stipulated as follows:

- a) Motorcycle and moped: 3.0 m<sup>2</sup>/pc;
- b) Bicycle: 0.9 m<sup>2</sup>/pc;
- c) Car: 25 m<sup>3</sup>/pc.

**5.2.11** In the event that there is no approved detailed planning, the following factors must be followed for the design of public buildings height:

- a) Width of the road boundary;
- b) Height of the surrounding building;
- c) Width of the building itself;
- d) Function of use, scale and percentage of blocks and refractory levels of the building;
- e) Height of operation of firefighting equipment of urban fire protection forces.

NOTE: Parts not included in the height limit of the building are the staircase, elevator, and water tank. The local drainage tube protrudes from the house surface but the ratio between the protruding part and the building must be consistent with the area landscape.

**5.2.12** For public buildings that need protection, separate barriers should be protected from the street. The barrier must be open-aired and beautiful.

## **6 Requirements for architectural design**

### **6.1 Floor height**

**6.1.1** Vertical clearance of rooms in public buildings is not less than 3.0m.

**6.1.2** For buildings with large spaces (such as halls, auditoriums, multipurpose rooms, lecture halls, other public spaces), depending on the requirements of use and size of equipment but the height of the floor is not less than 3.6m.

**6.1.3** Vertical clearance of basement, technical floor and attic is not less than 2.2 m

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Where the basement is used as a service or commercial space, the vertical clearance is not less than 3.0 m.

NOTE: For public buildings with technical floors, the height of the technical floor is determined by design, regardless of the height of the floor, but it must be included in the building height to calculate the volume of the building.

**6.2 Lobby, hallway**

**6.2.1** Design of lobby, floor lobby, hallway (horizontal traffic), transition space must ensure circulation in the building and take into account the possibility of escaping to safe areas if there is any incident.

**6.2.2** In public buildings, the lobby is calculated according to the area norm of 0.2 m<sup>2</sup>/person to 0.3 m<sup>2</sup>/person.

**6.2.3** The width of the hallway is calculated according to emergency exit requirements, fire prevention and the following requirements:

- For side hallway: no less than 1.8 m;
- For middle hallway: no less than 2.1 m.

**6.3 Toilet area**

**6.3.1** The toilet area must be prioritized for direct lighting and natural ventilation.

NOTE: In case of natural ventilation does not meet the requirements, mechanical ventilation will be used.

**6.3.2** Number of equipment and height of equipment installation in toilet areas must conform to technical requirements and use requirements of each type of public buildings.

**6.3.3** The slot slope and the ground slope in the toilet areas are not less than 2% towards the drainage ditch or the receiving hopper.

**6.3.4** The floor surface, the slot on the floor and the exposed surface of the pipe penetrate the floor and floor with the wall surface to be waterproof, water-prevention.

**6.3.5** Toilet grounds and walls must use non-slip materials, do not absorb water, do not stain, are subject to erosion and easy to clean.

**6.4 Risers, guardrails, ramps**

**6.4.1** The risers in the crowded place with the number of risers more than 3 need to have guardrails and handrails arranged on both sides.

**6.4.2** The width of a riser is not less than 0.3 m. Height of a riser is not more than 0.15 m.

**6.4.3** In all places adjacent to the outside (such as balconies, outside corridors, inside corridors, skylights, roofed houses, stairways outside the building ...) must arrange guardrails

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and ensure the following requirements:

- a) The guardrail must be made of strong, solid materials, withstand horizontal loads, calculated according to the provisions in TCVN 2737;
- b) The guardrail height is not less than 1.1m from the finished floor surface to the upper handrail;
- c) Within a distance of 0.1 m from the building surface or the floor of the guardrail, it must not be exposed;
- d) Net distance between vertical bars is not more than 0.1 m;
- e) Minimum height of the guardrail is specified in Table 1.

**Table 1 - Minimum height of a guardrail**

in millimeters

Location	Minimum height
1. Loggias and terraces of positions from the 9th floor or higher	1 400
2. Stairs, ramps	900
3. Other positions	1 100

**6.4.4** For the entrance with a riser to design a slope, it is necessary to ensure that the disabled have access to the slope from 1/12 to 1/20 and comply with the regulations in TCXDVN 264:2002.

**6.4.5** The slope must be flat, not rugged, non-slip and has handrails on both sides.

**6.5 Stair**

**6.5.1** Number and position of stairs must meet the requirements of using and safe escape

**6.5.2** Horizontal clearance of a stair depends on the usage characteristics of the building, complying with regulations on life safety [2], fire safety for houses and buildings [3] and related regulations.

**6.5.3** When the stair changes its direction, the minimum width of the landing handrail is not less than the run. Any demand in carrying big goods can be expanded to match the requirements of use.

**6.5.4** The height of a stair is not less than 2.0 m and a landing must be arranged. The length

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Liên hệ: **0934.436.040** (Zalo, Viber, WhatsApp, Wechat)

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