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OF THE PEOPLE'S REPUBLIC OF CHINA
中华人民共和国国家标准

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Code for Design of Civil Buildings

民用建筑设计通则

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Introduction

This version is one of China's engineering construction standards in English series, which, in compliance with the relevant procedures and stipulations, has been organized to translate by China Association for Engineering Construction Standardization(CECS) authorized by Ministry of Housing and Urban-Rural Development(MOHURD) of the People's Republic of China. On December 4, 2008, MOHURD published it by means of Announcement of No. 177.

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Many thanks should go to the staff from the relevant standard development organizations and groups who have provided practical assistance through their hard work.

For the sake of improving its quality, any kind of constructive criticism, comments and suggestions in association with this version is welcome. It would be greatly appreciated if they could be fed back to CECS.

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Announcement of publishing the national standard "Code for Design of Civil Buildings" by the Ministry of Construction of the People's Republic of China

Hence the new Standard "Code for Design of Civil Buildings" has been approved as a national standard with a serial number of GB 50352—2005, which shall come into force upon July 1, 2005. Herein, Articles (Items) 4.2.1、6.6.3 (1、4)、6.7.2、6.7.9、6.12.5、6.14.1 are compulsory provisions and must be enforced strictly. The former "Code for Design of Civil Buildings" JGJ 37—87 shall be abolished simultaneously.

Authorized by the Institute of Norm and Ration of the Ministry of the People's Republic of China, this code is published and distributed by China Architecture & Building Press.

Ministry of Construction of the People's Republic of China

May 9, 2005

Foreword

This Standard is revised version of the "Code for Design of Civil Buildings" JGJ 37 —87 on the basis of the requirements in Document JB [2001] No. 87 of the Ministry of Construction. This Code was revised by the revision team after the wide investigation and research, careful summarization of the practical experiences, with references to relative international standards and advanced codes in aboard, and on the basis of widely asked for comments.

This code comprises eight chapters with the main contents as follows: 1. General provisions; 2. Terms; 3. Basic requirements; 4. Limits of the urban planning to the buildings; 5. Design of sites; 6. Design of buildings; 7. Indoor environments; 8. Building facilities.

The main revised technical contents are: The design rule, designed service time, the basic requirements of the climate sub area to the buildings, the outshoot of the building, building plan, indoor environments; the terms, floor plan layout, building curtain wall, interior and exterior decoration, and building facilities are added in this Code.

The provisions printed in the bold type are compulsory ones and must be enforced strictly.

Ministry of Construction is in charge of the administiation of this code and the explanation of the compulsony provisions, the China Institute of Building Standard Design & Research is responsible for the explanation of the specific technical contents.

All relevent orginzations are kindly requested to sumup and accumulate your experiences, accumulating information, and mail relevant suggestions and comments at any time to: China Institute of Building Standard Design & Research (19, Che Gong Zhuang Da Jie Street, Outside of Xizhimen, Beijing Urban, China, Post Code: 100044) for references of the later revision of this Code.

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1 General Provisions

1.0.1 This code is formulated with a view to make the civil buildings meet the basic requirements of usability, economy, safety, sanitation, environmental protection and so on, this Code was made to be the general rules that must be complied in the design of all kinds of civil buildings.

1.0.2 This Code is applicable for the design of construction, renovation, and extension of civil buildings.

1.0.3 The design of civil buildings shall be not only in compliance with relative national laws and codes in the engineering construction, but also shall be in accordance with the following requiremert:

1 Shall correctly manage relative relationships between people, building and environment according to the principles of the sustainable development strategy;

2 Must protect the ecology environment, prevent pollution and destroy of environment;

3 Shall in compliance with the substantial and vigorous needs of people, based on peoples orientation;

4 Shall carry out the basic national policies of saving fields, energy, water, and raw material;

5 Shall comply with provisions of local urban planning, and be harmonize with surrounding environment;

6 The building and environment shall adopt synthetically the disaster prevention and safety measurements of fire protection, anti-seismic, flood protection, anti-aircraft, anti-storm and snow, anti-lightning strike and so on;

7 To be convenient for the usage of handicapped people, old people and so on, the accessibility facilities shall be provided in the indoor and outdoor environments;

8 All kinds of constructions in the areas of all grades of historical culture famous cities, historical culture protection zones, culture protection units, and famous scenic sites that issued by the nation and local districts, shall be done according to the protection planning and relative bylaws established by nation and the local district.

1.0.4 Not only the requirements stipulated in this code, but also those in the current relevant ones of the nation shall be complied with.

2 Terms

2.0.1 Civil building

Total of the buildings used for providing inhabitation and public activities of people.

2.0.2 Residential building

Buildings used for providing dewelling of people.

2.0.3 Public building

Buildings used for provideng all kinds of public activities of people.

2.0.4 Accessibility facilities

Safety facilities to be convenience for handicapped or old people, Such as persons with disabilityies or eyesight obstacle.

2.0.5 Parking space

Indoor, outdoor spaces for parking the automotive vehicles and non-automotive vehicles.

2.0.6 Construction site

The site used for the construction project, which is determined according to the characteristic of field and land-use right.

2.0.7 Boundary line of roads

Boundary line of the land used of the planned urban roads (including the district-grade roads in the residential area).

2.0.8 Boundary line of land; property line

Boundary line, of the scope of land-use right of all kinds of construction projects.

2.0.9 Building line

Boundary line that the position of the foundation bottom of the buildings and structures shall not be exceeded which is determined by the relative code or detail planning.

2.0.10 Building density; building coverage ratio

The ratio (%) of the total area of foundation bottom of construction works to the area of land used in a specific scope.

2.0.11 Plot ratio, floor area ratio

The ratio (%) of the total building area to the area of land used in a specific scope.

2.0.12 Greening rate

The ratio (%) of the total area of all kinds greening lands occupied to the total area of the specific district.

2.0.13 Insolation standards

The sunlight time obtained by the exterior window, started from the surface of ground floor windowsill, of the building, within the range of effective sunlight time of the specified sunlight standard day (Middle Winter Day or Severe Cold Day), which is determined by the climate zone that the building located, the size of the city and the usage characteristics of the building.

2.0.14 Storey height

The vertical distance that is calculated between the floor surfaces, ground surfaces (completed surface) of all stories of the building, in the top storey, it is the vertical distance from the floor surface (completed surface) to the flat roof structural surface or to the point of intersection of extension lines of pitched roof structural surface, and the external surface of external wall.

2.0.15 Interior net storey height

The vertical distance of the effective usable space, i. e the vertical distance between the floor (ground) surface (completed surface) to the suspended ceiling or bottom surfaces of the floor or roof.

2.0.16 Basement

The basement is the room with ground floor level lower than the outdoor ground level exceeds 1/2 of the net height of the room.

2.0.17 Semi-basement

The semi-basement is the room ground floor level lower than the outdoor ground level exceeds 1/3 but not exceeds 1/2 of the net height of the room.

2.0.18 Mechanical floor

The floor space in the building specially set for the installations and pipelines of heating, ventilation, air conditioning, water supply, drainage, distribution and transformation of electricity and so on, and for persons comes into for operation.

2.0.19 Refuge storey

For the high-rise buildings higher than 100m, a floor specially provided for the evacuation and refuge of the people for the fire safety.

2.0.20 Open floor

The floor has only the structural supporting but has no envelope construction.

2.0.21 Step

The stepped construction for the walking of the people that is set between different levels of indoor or outdoor ground or floor.

2.0.22 Ramp

The sloping traffic road that connects floor surface or ground surface with different levels for the walking of people or moving of vehicles.

2.0.23 Railing

The protection and separation components with height between the breast and abdomen of people, use to protect people's safety or for the separation of space.

2.0.24 Stair

The building component used for the vertical traffic between the stories, which is composed of continual walking steps, rest landings, railings (or guard screens) for safety, armrests and the relative supporting structures.

2.0.25 Deformation joint

The construction joint, provided to prevent the crack, impact, or even damage of the building because of the additive deformations and stresses produced in the structure due to the outside factors to the building, including expansion joint, settlement joint and aseismatic joint.

2.0.26 Building curtain wall

The building external envelop structure, composed of steel frames and panels, which doesn't bear the main structure's loads and actions.

2.0.27 Suspended ceiling

The ceiling that is suspended under the roof or the floor structure of the building.

2.0.28 Pipe shaft

The vertical enclosed way in the building for the setting of vertical facility pipelines.

2.0.29 Smoke uptake; smoke flue

The shaft for discharging all kinds of smokes.

2.0.30 Air relief shaft

The shaft for discharging the indoor steam, humidity or contaminated air, and transforming fresh air.

2.0.31 Decoration; finishing

The detail process and artificial treatment of the inside, outside space of the building relying on the main structure of the building.

2.0.32 Daylighting

Technology of obtaining natural light illumination for available internal spaces of the building meeting the requirements of usage, safety, comfort, being beautiful to look at and so on, thus to ensure that the living, working or producing activities of the people have proper light environment.

2.0.33 Daylight factor

The ratio between the illumination at one point of a specific indoor surface, due to direct or indirect diffused sky radiation from the assumed or known sky brightness distribution and the illumination at one outdoor horizontal surface without shelter due to diffused sky radiation of same hemispherical sky at the same time.

2.0.34 Standard value of daylight factor

Daylight factor value of the indoor and outdoor critical natural light illumination.

2.0.35 Ventilation

In order to ensure the living, working or producing activities of the people has proper air environment, the technology of change the air in the internal available spaces of the building by means of natural or mechanical methods, to make the air quality meet the requirements of sanitation, safety, comforts and so on.

2.0.36 Noise

The outside disturbing sound that influences the normal living, working, study, rest and even damages the health of people.

3 Basic Requirements

3.1 Classification of civil buildings

3.1.1 The civil buildings can be divided into two categories according to their usage function, say residential building and public building.

3.1.2 The classification of the civil buildings according to their number of stories or height above ground shall comply with following specifications:

1 The classification of residential buildings according to number of stories: the low-rise residential building for 1 to 3 stories, the multi-storey residential building for 4 to 6 stories, mid-high rise residential building for 7 to 9 stories and the high-rise residential building for 10 or more than 10 stories;

2 When the height of the civil buildings, except the residential building, is not higher than 24m, it is the single-storey and multi-storey buildings, when it is higher than 24m, it is the high-rise building (not including the single-storey public building with height larger than 24m);

3 The height of the civil building is higher than 100m, it is super high-rise building.

Note: The number of stories and height calculation of the buildings in this provision shall comply with relative specifications in the fire-proofing code.

3.1.3 The grade sort classification of the civil buildings shall comply with relative standards or specifications issued by relative authorities.

3.2 Design service life time

3.2.1 The design service life time of civil buildings shall be in accordance with those specified in Table 3.2.1.

Table 3.2.1 Classification of design service life time

Sort	Design service life time (year)	Example
1	5	Temporary buildings
2	25	Buildings with easy substitution of structure components
3	50	Normal buildings and structures
4	100	Memorial buildings and special important buildings

3.3 General requirements of building climate sub-area to buildings

3.3.1 The general requirements to buildings of the building climate sub-area shall be in accordance with those specified in Table 3.3.1. The building climate zoning planning

map in China, see Appendix A.

Table 3.3.1 General requirements of different sub area to buildings

Title of sub area		Title of thermo-technical sub area	Main indexes of the climate	General requirements of the buildings
Ⅰ	ⅠA ⅠB ⅠC ⅠD	Severe cold region	Average air temperature in January ≤−10℃ Average air temperature in July ≤25℃ Average comparative humidity in July ≥50%	1. Building must meet the requirements of cold insulation, cold proofing, frost protection, etc. in winter 2. In ⅠA, ⅠB region, shall prevent the damages of building due to frozen earth, snow cover 3. In the west part of region of ⅠB, ⅠC, ⅠD, the buildings shall protection for hailstorm, sandy storm
Ⅱ	ⅡA ⅡB	Cold region	Average air temperature in January −10～0℃ Average air temperature in July 18～28℃	1. Buildings shall meet the requirements of cold insulation, cold proofing, frost protection, etc. in winter, in part regions shall also consider hot proofing 2. In ⅡA region, buildings shall have hot, humidity, rainstorm protections, in sea-board regions, shall protection for the salt fog corrosion
Ⅲ	ⅢA ⅢB ⅢC	Hot summer, cold winter region	Average air temperature in January 0～10℃ Average air temperature in July 25～30℃	1. Buildings must meet the requirements of hot proofing, sunshade, ventilation and cool down in summer, shall also consider cold proofing in winter 2. Buildings shall have protection for rain, humidity, flood, thunder. 3. In ⅢA region, shall have protection for typhoon, rainstorm and salt fog corrosion
Ⅳ	ⅣA ⅣB	Hot summer, warm winter region	Average air temperature in January >10℃ Average air temperature in July 25～29℃	1. Buildings must meet the requirements of heat protection, sunshade, ventilation, rain protection in summer 2. Buildings shall have protection for rainstorm, humidity, flood, thunder 3. In ⅣA region, shall have protection for typhoon, rainstorm and salt fog corrosion
Ⅴ	ⅤA ⅤB	Mild climate region	Average air temperature in July 18～25℃ Average air temperature in January 0～13℃	1. Buildings must meet the requirements of rainproofing and ventilation 2. In ⅤA region, shall have cold proofing, in ⅤB region, shall especially have protection for thunderstroke
Ⅵ	ⅥA ⅥB	Severe cold region	Average air temperature in July <18℃ Average air temperature in January 0～−22℃	1. Thermo-mechanics shall meet relative requirements in severe cold and cold regions 2. In ⅥA, ⅥB regions, shall prevent the influence of frozen earth to fundation and underground pipeline of building, and shall especially have protection for sandy wind 3. In east region of ⅥC, building shall have protection for thunderstroke.
	ⅥC	Cold region		

Table 3.3.1 (continued)

Title of sub area		Title of thermo-technical sub area	Main indexes of the climate	General requirements of the buildings
Ⅶ	ⅦA ⅦB ⅦC	Severe cold region	Average air temperature in July ≥18℃ Average air temperature in January −5～−20℃ Average comparative humidity in July <50%	1. Thermo-mechanics shall meet the relative requirements in severe cold and cold regions 2. Except in Ⅶ D regions, shall prevent the damage of frozen earth to fundation and underground pipeline of building 3. In Ⅶ B region, shall especially caution to avoid the damage of snow cover 4. In Ⅶ C region, building shall especially caution for the protection of sandy windstorm, also have hot proofing in summer 5. In Ⅶ D region, building shall have heat protection in summer, in Tulufan Basin, shall especially caution for the heat insulation, temperature cooling down
	ⅦD	Cold region		

3.4 Relation of building and environment

3.4.1 The relation of building and environment shall be in accordance with the following requirements:

1 The construction site shall be selected in the safe region without dangers of geologic hazard or flooding and so on;

2 The overall layout of the building shall uniteable with local natural and geography environment characteristic, and shall not destroy the natural ecology environment;

3 The surrounding of the building shall have the sanitation conditions of obtaining sunlight, daylighting, natural ventilation and so on;

4 The air, soil, water body in the surroundings of the building shall not have harm to people, to ensure the sanitation and safe environment;

5 Garbage, exhaust gas, wastewater and so on which produced during the use of the building shall be treated, and control the noise, glare and so on, shall not bring public harm;

6 The overall shape and color treatment of the building shall be harmonic with the surrounding environment;

7 The construction site shall make the design of greening, beautification of environment, and consummate the outdoor environmental facilities.

3.5 Accessibility facilities of the building

3.5.1 The accessibility facilities shall be set on roads, public greening, and public service facilities in the residential region, and shall be connected with accessibility facilities on urban roads.

3.5.2 The accessibility facilities shall be set in the public traffic area in the civil build-

ings with elevators.

3.5.3 The accessibility facilities shall be set in the buildings that are especially for the handicapped and old peoples.

3.5.4 The scope of implementation and design requirements of the accessibility facilities in the residential regions and civil buildings shall meet the requirements of current national standard "Code for design of accessibility facilities in urban roads and buildings" JGJ 50.

3.6 Parking space

3.6.1 Parking lot (garage) shall be set near by the construction, extension of residential district or the garage is built attached in residential buildings. The number of parking space of motor vehicles and non-motor vehicles shall meet relative code or regulations of the local urban planning administration authorities.

3.6.2 For constrution and extension of public buildings, the parking spaces of motor vehicles and non-motor vehicles shall be set in the buildings, or in the same site, or in the parking lot (garage) that was constructed and planned as a whole, according to the building area or number of users, and under the regulations of the local urban planning administration authorities.

3.6.3 The noise or exhaust gas that are produced by the parking lot (garage) of motor vehicles shall be treated, and not influence the surrounding environment, its design shall meet the requirements of relative codes.

3.7 Buildings without nominated number of users

3.7.1 Except for buildings with fixed seats or normimated number of users, the number of users for buildings shall be determined in accordance with relative design codes, or the rational number of users shall be determined through investigation and study, and the width of exits shall be calculated accordingly.

3.7.2 In the public building with multi-functions, where all kinds of spots might be opened at the same time and use the same exit, the width of the safety evacuation exit in the horizontal direction shall be calculated according to the sum of the number of users in all spots, and the width of safety egress in the vertical direction shall be calculated according to the storey with maximum number of users.

4 Limits of the urban planning to the building

4.1 Construction site

4.1.1 The usage characters of the building in the site shall meet the land use characters determined by the urban planning.

4.1.2 The site shall adjoin with the boundary line of roads, otherwise there shall be site roads connecting with the urban roads defined by the boundary line of the roads. When the building area in the site is smaller than or equal to $3000m^2$, the width of the site road shall not be smaller than 4m, when the building area in the site is larger than $3000m^2$, and there is only one site road connecting with the urban road, the width of the site road shall not be smaller than 7m, if there are two roads connecting with the urban roads, the width of the site road shall not be smaller than 4m.

4.1.3 The altitude of the site ground shall be in accordance with the following requirements:

1 The altitude of the site ground shall be designed according to the control elevation determined by the urban planning;

2 The altitude of the site ground shall be in accordance with the elevations of adjacent sites, and shall not obstruct the drainage of all adjacent sites;

3 The altitude of the site ground in the lowest place shall better be higher than the lowest altitude of the adjacent urban road; otherwise there shall be measures to discharge the ground surface water.

4.1.4 The relation of the adjacent sites shall be in accordance with the following requirements:

1 There shall be clear spaces and roads between the buildings and the adjacent sites in accordance with to the requirements of building fire-protection and so on. When there are clear spaces or roads in front or behind the building, and comply with the relative provisions of fire-proofing codes, the buildings in the two sides of the boundaries of the adjacent sites can be constructed adjoining to eachother;

2 The buildings and structures in the site shall not influence the insolation standard and daylight standard of the buildings in this site or in the other field;

3 Except the permanent clear space determined by the urban planning, the buildings constructed along with the boundary lines must not set openings, doors, opening outward windows, balconies, eaves, outdoor air conditioning machines, exhaust air outlet and drainage of rainwater in the direction towards the adjacent site.

4.1.5 The positon of means of excess of motor vehicles in the site shall be in accordance with the following requirements:

1 The distance to the junction of the main roads, in the large-scale or middle-scale cities, shall not be less than 70m, measuring from the crossing of the boundary line of the road;

2 There shall not be less than 5m from the closest edge line of pedestrian crosswalk line, flyover, underpass (including approach road, bridge);

3 There shall not be less than 15m for the distance to the entrance of subway, edge of public traffic station;

4 There shall not be less than 20m for the distance to the entrance of parks, schools, buildings for children and handicapped;

5 When the slope degree of the site road is larger than 8%, there shall be buffering section connecting with the urban road;

6 The distance to the flyover crossing or other special circumstances shall comply with regulations of local urban planning administration authorities.

4.1.6 The site with buildings have congestion of people such as large-scale or super-large-scale entertainments, commercial services, sports, traffics and so on shall be in accordance with the following requirements:

1 There shall be at least one side of the site directly adjoining the urban road, which shall have enough width to decrease the influence of evacuating people to the normal urban traffic;

2 The length of the site along the urban road shall be determined by the scale of the building or the number of the evacuating people, and shall at least not be less that 1/6 of the perimeter of the site;

3 There shall at least two or more than two directions leading to the egress of the urban road (including the connected site road);

4 Main means of excess of the site or building must not be directly connected with the express way, and must not directly towards the crossing of the main roads of the city;

5 There shall be circulation space before the main passageways of the building, its area and dimensions of length and width shall be determined by the usage characters and number of people;

6 The layout of greening and parking lots shall not influence the use of the circulation space, and should not set barriers like enclosure or gateway and so on.

4.2 Building outshoot

4.2.1 The buildings and the attached facilities shall not be constructed projecting out the

boundary line of roads and the construction site, the construction works which shall not shoot out are:

——Underground construction works and attached facilities, including structural retaining pile, retaining wall, basement, bottom plate and foundation of basement, septic tank and so on;

——Above ground construction works and attached facilities, including porch, corridor, balcony, outdoor stair, step, ramp, flower pool, fence, platform, apron and open sewer, air inlet and outlet of basement, passageway of basement, inlet well, light well and so on;

——Other facilities except connecting the city's municipal public facilities like pipelines, tunnels, flyover bridges and so on in the site.

4.2.2 The construction works projecting out the boundary line of road which got the approval of the local urban planning administration authorities shall be in accordance with the following requrements:

1 In the space above the road surface with foot pave way:

1) The outshoot building components that is allowed to project out above 2.50m: bay window, window sash, window cover, place for air conditioning machine, the projecting depth shall not be larger than 0.50m;

2) The movable sunshade is allowed to project out above 2.50m, the projecting width shall not be larger than the width of the sidewalk minus 1m, and also shall not be larger than 3m;

3) Rain cover and eaves is allowed to project out above 3m, the projecting depth shall not be larger than 2m;

4) Rain cover and eaves is allowed to extrude above 5m, the projecting depth should not be larger than 3m.

2 In the space above the road surface without foot pave way: the outshoot building components is allowed above 4m: window cover, place for air conditioning machine, the projecting depth shall not be larger than 0.50m.

3 The construction outshoot shall be firmly connected with the construction work itself.

4 The construction work and the construction outshoot can not discharge directly the rainwater, air conditioning condensation water and waste water from other facilities towards the road.

4.2.3 When the local urban planning administration authorities define an additional construction control line inside the land-use boundary line of the site, the foundation bottom of the construction shall not exceed the construction control line, the construction outshoot and attached facilities which project out the construction control line shall

meet the requirements of the local urban planning.

4.2.4 The construction works or structures needed to achieve commonweal necessaries and does not influence the traffic and fire-fighting safety, including the public facilities like public telephone box, public traffic station, police booth and similar temporary construction works and structures, may be constructed project out of the boundary line of road after the approval of the local urban planning administration authorities.

4.2.5 The construction of the gallery building, arcaded building, and cantilever building along the road boundary line shall not influence the safety of traffic and fire-fighting; The facilities like the directly exhausting air conditioning machine, discharge fan and the ventilation system which discharges harmful gas shall not be set in the public space with roof.

4.3 Control of the building height

4.3.1 The height of building shall not be harmful to the public safety, sanitation and sightseeing, the height of the building in the following districts shall be under control:

1 In the district that has special requirements for the building height, it shall be controlled according to the urban planning requirements;

2 For the buildings along the urban road, the height of the alongside wing buildings and main tower building shall be controlled according to the width of the road;

3 For buildings around the airport, broadcasting station, telecom, microwave communication, observatory, satellite ground station, military stronghold projects ad so on, when it is located within the scope of some kind of technical control district, the height of the building shall be controlled according to the net head space requirements;

4 When the building is within the protection planning district defined in article 8, item 1.0.3 in Chapter 1 of this code.

Note: The control of the height of the building shall also meet the requirements in the local urban planning administration authorities and relative specialized departments.

4.3.2 The calculation of the control of building height shall be in accordance with the following requirements:

1 The building height within the control district of article 3、4, item 4.3.1: shall be calculated according to the height from the outdoor ground surface of the building to the highest point of the building or structure;

2 The building height that is not within the control district of article 3、4, item 4.3.1: for the flat roof, it shall be calculated according to the height from the outdoor ground surface of the building to the top point of the roofing or the parapet wall; for the pitched roof, it shall be calculated as the average height from the outdoor ground surface of the building to the eave and ridge of the roof; the following outshoot shall not be calculated in the building height:

1) The attached rooms that partly projected outside the roof such as the stair room, elevator machine room, water tank room and similar auxiliary rooms, occupying the surface area of the roof does not exceed 1/4;
2) The air relief shaft, chimney, decorative components, flower shelves, communication facilities and so on, that extrude outside the roof;
3) Facilities such as air conditioning cooling tower and etc..

4.4 Building density, plot ratio and greening ratio

4.4.1 The building design shall meet the requirements of the building density, plot ratio and greening ratio controlled by the legal planning.

4.4.2 When the construction unit provide permanent building open space for the city and for public use unconditionally in their building design, the established building density and plot ratio of this site may be increased properly, and shall meet the relative regulations in the local urban planning administration authorities.

5 Design of site

5.1 Layout of the buildings

5.1.1 An overall general layout for buildings, roads, vertical planning, greening and engineering pipelines and etc. shall be issued for civil buildings according to the condition of the urban planning and requirements of tasks, and by principle rules for the relation between buildings and environment.

5.1.2 The layout of the buildings shall be in accordance with the following requirements:

1 The spacing of buildings shall meet the requirements in the code of fire-proofing;

2 The spacing of buildings shall meet the requirements of the daylighting of the rooms of buildings (Daylighting in the section 7.1 in Chapter 7), and shall avoid the disturbance of sight line;

3 The buildings that have sunlight requirement shall meet the requirement of insolation standard of the building in item 5.1.3 in this sub-clause, and shall comply with relative regulations of spacing of buildings established by the local urban planning administration authorities;

4 For regions have natural disasters such as earthquakes and etc., the layout of the buildings shall comply with provisions of relative safety standards;

5 The layout of the buildings shall make the people flow, vehicle flow and goods flow in the site of buildings separate reasonably, avoid the disturbance, and be advantage for the fire protection, parking and circulation of people;

6 The layout of the building shall be arranged according to the region climate characteristics, to prevent and resist the attack of the disaster like cold, summer hot, strong wind, rainstorm, snow cover, sand and dust and etc, and shall utilize the natural air flow to organize ventilation, and prevent come into being bad microclimate;

7 According to the position, direction and level of the noise source, the all-around measures for building functional sub-area, layout of roads, building orientation, spacing and landform, barrier function of greening and buildings and etc., shall be adopted, to prevent or decrease the environmental noise;

8 The sanitation distance between the buildings and all kinds of pollution sources shall comply with provisions of relative sanitation standards.

5.1.3 The building insolation standard shall be in accordance with the following re-

quirements:

1 In each unit of residential house shall at least has one dwelling space can obtain sunlight, with sunlight standard comply with relative provisions in current national standard "Code for planning and design of urban residential region" GB 50180;

2 In the dormitory, more than half of the rooms shall obtain the sunlight with standard equal to the sunlight standard for dwelling space of residential house;

3 Main living rooms in baby farms and kindergartens shall obtain the sunlight standard with sunlight time not less than 3h in the midwinter day;

4 The bedroom, living room of the residential building for the old and handicapped people, more than half wards and recuperation rooms in hospitals and sanatoriums, more than half classrooms of primary school and middle school, shall obtain the sunlight standard with sunlight time not less than 2 hours in the midwinter day.

5.2 Roads

5.2.1 Roads in the construction site shall be in accordance with the following requirements:

1 In construction site, site road shall be set to connect with the urban roads, on the connecting site road for motor vehicles, speed limit facilities shall be set on road surface and the site road shall be able to reach the safety exit of buildings;

2 The foot pave way connecting the streets and the internal yard shall be set for the buildings along the street (can use the staircase), its spacing should not be larger than 80m;

3 When the road changes direction, the greening and the buildings beside the road shall not influence the effective sight distance of driving vehicle;

4 When there is underground garage in the site, effective displaying symbols shall be set at the means of excess of vehicles, the setting height of the symbol shall not influence the traffic for people and vehicles;

5 When the vehicle flow rate in the site is relatively big, the pave way shall be set.

5.2.2 The road width in the construction site shall comply with following provisions:

1 For one-way road, the width shall not be less than 4m, for double-way road, the width shall not be less than 7m;

2 For the foot pave way, the width shall not be less than 1.50m;

3 When utilizing the road side for parking, it shall not influence the effective traffic width;

4 When the road changes direction, it shall meet the requirement of the minimum turning radius of the vehicles; the road for fire truck shall be set according to the minimum turning radius of the fire truck.

5.2.3 The spacing between the road and the building shall be in accordance with the following requirements:

1 When there is outdoor hydrant in the site, the spacing between the road for vehicles and the building shall meet the reqwirernewts in the code of fire proofing;

2 The minimum distance from the edge of road in the site to the building or structure shall comply with relative provisions in the current national standard "Code for planning design of urban residential district" GB 50180;

3 There should not set overhead road for vehicles in the site, when the overhead footpath is set paralleling with the building, there shall have enough sight distance to protect privacy and the requirement of noise reduction.

5.2.4 The setting of the means of excess of the underground garage in the construction site shall be in accordance with the following requirements:

1 The distance from the means of excess of the underground garage to the crossway of the site road or the slope staring point of the overhead road shall not be less than 7.50m;

2 When the means of excess of the garage is perpendicular to the road, the means of excess shall keep the safety distance of not less than 7.50m with the boundary line of the road;

3 When the means of excess of the garage is parallel to the road, there shall be a buffer length of roadway not less than 7.50m to converge into the site road.

5.3 Vertical

5.3.1 The ground surface and the slope of road in the construction site shall be in accordance with the following requirements:

1 The slope of site ground surface shall not be less than 0.2%, when its slope is larger than 8%, it should be divided into mesas, and retaining wall or retaining slope shall be set at clifflike connecting sides of mesas;

2 The longitudinal gradient of the roadway in the site shall not be less than 0.2%, and shall not be larger than 8%, its grade length shall not be larger than 200m, for some specific roads, it can be not larger than 11%, its grade length shall not be larger than 80m; in severe cold and heavy snowing district, it shall not be larger than 5%, its grade length shall not be larger than 600m; its cross gradient shall be 1%～2%;

3 The longitudinal gradient of the site-in road not for motor vehicles shall not be less than 0.2%, and shall not be larger than 3%, its grade length shall not be larger than 50m, in severe cold and heavy snowing district, it shall not be larger than 2%, its grade length shall not be larger than 100m; its cross gradient shall be 1%～2%;

4 The longitudinal gradient of the pave-way in the site shall not be less than

0.2 %, and shall not be larger than 8%, in severe cold and heavy snowing district, it shall not be larger than4%, its cross gradient shall be 1%～2%;

5 Accessibility pave-way shall be set at the main section for the activies of flow of people in the site.

Note: The vertical design in mountanious and hilly district, the vertical design shall also meet the reqwirements of relative regulations.

5.3.2 The drainage of the ground surface in construction site shall be in accordance with the following requirements:

1 There shall have measures to discharge the rainwater of the ground surface and road surface to the urban drainage system, the drainage method shall be determined according to the requirements of urban planning, and there shall have recycling and re-utilizing measures of rainwater for those districts with implement conditions;

2 When using the roadways to discharge the rainwater of the ground surface, the type and number of the gully shall be determined by the area of the water converge, runoff amount, longitudinal gradient of the road and so on;

3 For roads with one side drainage and at low-lying and easy be submerged section, the drainage measure that does not influence the traffic and cleaning of the road surface when discharging the water shall be adopted.

5.3.3 At the entrance of the ground floor of the building, there shall have measures to prevent the circumfluence of the outdoor ground rainwater.

5.4 Greening

5.4.1 The construction project shall include the greening project; its design shall be in accordance with the following requirements:

1 All-around greening should be adopted, including vertical greening, roof greening and so on; the index of the greenbelt area shall meet the provisions in the relative code or in the local urban planning administration authorities;

2 The configuration and layout methods of the greening shall be determined according to the city climate, soil, environment function and so on;

3 The distance between the greening and the building, structure, road and pipeline shall comply with provisions in the relative code;

4 Natural ecology environment shall be protected, and shall adopt measures to protect old and famous trees;

5 The wrapping of the root system of the trees to the underground pipelines and destroy to the underground water-proof layer of building shall be prevented.

5.5 Layout of the project pipelines

5.5.1 The project pipelines should be laid under the ground; the overhead pipelines

and the facilities setting on the ground of the project pipelines must meet the requirement of the passes of fire-fighting vehicles, and shall not disturb the normal activities of normal vehicles, and foot passengers, and also shall avoid the disadvantage influences to the sight of buildings and landscape.

5.5.2 For project pipelines connecting with the urban pipe network, its plan location and vertical elevation shall adopt the uniform coordination system and altitude system in the city.

5.5.3 The installation of the project pipeline shall not influence the safety of the building, and shall also prevent the pipelines damaged by the influence of corrosion, sinking, vibration, loads and so on.

5.5.4 The arrangement of project pipelines shall be integrated according its different characteristics and requirements. For the project pipelines that have influences to the safety, sanitation, anti-disturbance and so on, shall not be laid in same pipe duct or nearby. When general pipe duct is used for installation of pipelines, for pipelines which has interference each other, shall be laid in different ditch (room) of the general pipe duct.

5.5.5 The direction of the underground project pipelines should be parallel or perpendicular to the road or the main body of the building. The project pipeline shall be laid shallow underground near building to deep underground near road. The layout of the project pipeline shall be short and convenience, minimize number of turnings. The crossing between the pipelines, pipeline and road shall be decreased.

5.5.6 The project pipelines run parallel with the road should not be laid under the roadway, when there is need to do so, may laid the project pipelines at where there are relative big buried depth and fewer overhauls under the roadway.

5.5.7 The horizontal and vertical clearance and buried depth between the project pipelines, the horizontal net spacing between the project pipeline and the building, structure, greening trees shall comply with relative codes.

5.5.8 The outdoor project pipelines in the seismic zone of more than grade 7, permafrost district, severe cold district, collapsed loess district and expansive soil district shall comply with provisions in relative codes.

5.5.9 The well cover of the inspection well of the project pipeline should have lock device.

6 Design of buildings

6.1 Layout plan

6.1.1 The layout plan shall be rationally arranged according to the usage characteristics, functions, and technology requirements of the buildings.

6.1.2 The location coordination dimensions of the column net, bay, span and so on of the layout plan shall meet the requirements in the current national standard "Uniform Standard for Architectural Modular Coordination" GBJ 2 and similar relative standards.

6.1.3 According to the usage function, most rooms or important rooms shall be arranged in the parts with good sunlight, daylight, ventilation and sight-seeing. For the rooms that have requirement of privacy, shall be prevented from the sight disturbance.

6.1.4 The layout plan should have some flexibility.

6.1.5 The layout plan of the buildings in the seismic zone should be regularly and orderly, and should not have shift storeys.

6.2 Storey height and indoor net height

6.2.1 The storey height of the building shall be determined comprehensively according to the usage function, technology requirements and technical economic conditions of the building, and shall comply with proviaions of the specific code for the building design.

6.2.2 The indoor net height shall be calculated according to the vertical distance from the finished floor surface of the storey floor and ground floor to the suspended ceiling or the bottom surface of the floor slab or beam; when the suspended component of the floor, roof or the bottom of the pipe influence the effective available space, it shall be calculated according to the vertical distance from the finished floor surface of the storey floor or ground floor to the bottom of the suspended component or the bottom of the pipe.

6.2.3 The indoor net height of the rooms in the building shall comply with provisions in the specific code for the building design; the net height of the lowest place in the basement, locally floorstorey, corridor and so on that has normal activity of the people shall not be less than 2m.

6.3 Basement and semi-basement

6.3.1 There shall have comprehensive measures to solve the usage functions for the basement and semi-basement, all functional spaces and all kinds of passageways such as

underground garage, underground people's air defense, all kinds of facility rooms and so on, shall be reasonably arranged; Relations between the underground space and urban subway, underground pave way and underground space shall be developed synthetically in such a way, connected each other, have clear traffic direction sign, short and convenient flow line.

6.3.2 When the basement and semi-basement uses as the main rooms, they shall meet the requirements of safety and sanitation, and shall be in accordance with the following requirements:

1 The living room for children and old people must not be set in the basement or semi basement;

2 The bed room and living room of the residential building shall not be arranged in the basement; when it is arranged in the semi-basement, the measures for daylight, ventilation, sunlight, moisture proofing, drainage and safety protection shall be adopted;

3 Singing and dancing, entertainment, projecting, recreation area in the building shall not be arranged at or under second storey of basement; when it is arranged at basement, the height difference between the basement floor surface and the ground surface at means of excess shall not be larger than 10m.

6.3.3 The envelop construction of the basement shall be regularly and orderly, its water proof grade and technical requirements not only shall meet the provisions of current national standard "Technical Code for Water Proof of the Underground Engineering" GB 50108, but also shall be in accordance with the following requirements:

1 The water catch basin shall be set in one or several places where the ground surface is relative low in the basement, and the standby power supply of the drainage pump and pipeline shall be provided;

2 There shall have measures to prevent water emerging and flow backwards for underground pipes, underground pipe duct, underground gallery and well floor gully, window well and so on.

6.3.4 The fire-resistant rating, fire zone, safety evacuation, anti-smoke evacuation facilities, indoor decoration in the room and so on of the basement, semi-basement shall comply with relative provisions of fire proofing code.

6.4 Mechanical floor, refuge storey and open floor

6.4.1 The arrangement of the mechanical floor shall be in accordance with the following requirements:

1 The net height of the mechanical floor shall be determined by the installation and maintenance needs of the facilities and pipelines;

2 When buildings, such as hotels and residential building, have relative more pipelines in rooms in the upper part of the buildings, and in the lower part has large space rooms or changes into room with other functions, so that the pipelines need to be changed, thus the mechanical floors should be set between the upper part and lower part;

3 The arrangement of the mechanical floor shall be convenience for the access of the municipal pipelines; the mechanical rooms, which have influences each other in fire proof, anti-explosion and sanitation, shall not be arranged neighbouring each other;

4 The mechanical floor shall have natural ventilation or mechanical ventilation; when the mechanical floor is arranged in the basement and there is no mechanical ventilation facility, the ventilation inlet or stack shall be set in the external wall of the basement, its area shall meet the requirements of air volumn income and outlet;

5 The machine room of the water supply and drainage facilities shall have water catch basin and standby power supply of the draining pump, the drainage pipeline or pipe joint shall be provided, the electric distribution room shall fulfill the arrangement of the circuit;

6 For mechanical rooms, the layout position and its envelop construction, detail of passing through partitions of pipelines, fire-proof wall and floor and etc. shall comply with relative provisions in the code of fire proofing.

6.4.2 For the super-high rise building with height more than 100m, the refuge storey (room) shall be set.

6.4.3 For the open floor and refuge storey that have normal activities of people, the net height shall not be lower than 2m.

6.5 Toilet, Wash room and bathroom

6.5.1 Toilet, Wash room and bathroom shall be in accordance with the following requirements:

1 Toilet, Wash room and bathroom in the building shall not be arranged directly on top of the rooms that have strict sanitation requirement or water proof, moist proof requirements like dining hall, food processing room, food store room, medicine, medical treatment, electric transformer and distribution room and so on; except single dwelling house, the washing room in the residential buildings shall not arranged directly above the bed room, living room, kitchen and dining room at lower storey;

2 The arrangement of the number of sanitation facilities shall meet the requirements of the specific building design code, in the public toilet, the ratio of the number of W. C. suite for women to the number of W. C. suite for men shall be properly increased;

3 The sanitation room should have natural daylight and the direct natural draft ventilationwithout convection through adjacent room, for the room without direct ventilation and the room in cold and severe clod district, the natural draught ventilation duct should be set; when the natural ventilation can not meet the need for air change, the mechanical ventilation shall be adopted;

4 Strict waterproof and leakage proofing measurees shall be set at the floor and ground surface, groove of the floor and ground surface, position where pipeline goes through the floor and the connection of the floor and wall;

5 The surface layer of floor and ground, wall or wainscot shall adopt materials that do not absorb water, dirt-proof, anti-crossion, easy to clean;

6 The floor and ground surface shall be anti-sliding, the elevation of them should a little bit lower than the one of corridor, and there shall be slope down towards the floor waste outlet or drain;

7 The indoor water supply and drainage pipes and ceiling in the bathroom shall prevent the falling down of the condensed water; the hot water pipe in the bathroom shall be prevented from scalding of the people;

8 Front room or shelter shall be set for public toilets for men and women;

9 Independent janitorial supplies room should be set for public toilets.

6.5.2 Plane dimensions of toilet and bath room compartment shall not be less than provisions in Table 6.5.2.

Table 6.5.2 Plane dimensions of toilet and bath room compartment

Category	Plane dimensions (width m × depth m)
Toilet compartment with outward opening door	0.90×1.20
Toilet compartment with inward opening door	0.90×1.40
Special toilet compartment for patients in hospital	1.10×1.40
Accessibility toilet compartment	1.40×1.80 (1.00×2.00 for rebuild)
Shower compartment with outward opening door	1.00×1.20
Shower compartment with dressing stool	1.00×(1.00+0.60)
Accessibility special bath room compartment	Bath (with outward opening door) 2.00×2.25 Shower (with outward opening door) 1.50×2.35

6.5.3 Distance between sanitary facilities shall be in accordance with the following requirements:

1 Clear distance between water faucet center of lavatory basin/washing basin and side wall surface should be not less than 0.55mm;

2 Distance between water faucet centers of paratactic lavatory basins/washing basins shall be not less than 0.70m;

3 Clear distance between outer bound of unilateral paratactic lavatory basin/wash-

ing basin and opposite wall surface shall not be less than 1.25m;

4 Clear distance between outer bounds of bilateral paratactic lavatory basins/washing basins shall be not less than 1.80m;

5 Clear distance between the long edge of tub and opposite wall surface shall be not less than 0.65m; clear width of short edge of accessibility tub bath room shall be not less than 2m;

6 Distance between centers of paratactic urinal spreaders shall not be less than 0.65m;

7 Clear distance between unilateral toilet compartment and opposite wall surface: when inward opening door is adopted, it shall not be less than 1.10m; when outward opening door is adopted, it shall be not less than 1.30m. Clear distance between bilateral toilet compartments: when inward opening door is adopted, it shall not less than 1.10m; when outward opening door is adopted, it shall not less than 1.30m;

8 Clear distance between unilateral toilet compartment and opposite urinal spreader/basin: when inward opening door is adopted, it shall be not less than 1.10m; when outward opening door is adopted, it shall be not less than 1.30m.

6.6 Step, Ramp and Railing

6.6.1 Step setting shall be in accordance with the following requirements:

1 Foot step depth for indoor and outdoor step of public buildings shall not less than 0.30m; foot step height shall not be larger than 0.15m and be not less than 0.10m. Antislip measures shall be taken for foot step. The number of indoor foot steps shall be not less than 2, and ramp shall be adopted when altitude difference is insufficient for two foot steps;

2 Protective measures shall be taken in high-density people area with site step height exceeding 0.70m and in the face of free side.

6.6.2 Ramp setting shall be in accordance with the following requirements:

1 Indoor and outdoor ramp slope should be not larger than 1∶8 and 1∶10, respectively;

2 Landing should be set for indoor ramp with horizontal projecting length exceeding 15m, and the width of landing depends on its usage function or required cushion space for equipment dimensions;

3 Slope of ramp used for wheelchair shall be not larger than 1∶12, and in difficult section shall be not larger than 1∶8;

4 The length and slope of ramp for bicycle pushing shall not exceed 6m and 1∶5, respectively;

5 The ramp for motor vehicle shall meet the requirements of current national

standard "Design Code for Garage" JGJ 100;

6 Antislipping measures shall be taken for ramp.

6.6.3 Guardrails shall be set at positions in the face of free side such as balcony, side corridor, indoor circular corridor, interior courtyard, roof with people on and outdoor stair, and shall be in accordance with the following requirements:

1 Railing shall be fabricated by solid and durable materials, and shall be able to bear horizontal load prescribed in load code;

2 Height of railing shall be not less than 1.05m when in the face of free space height below 24m; and height of railing shall be not less than 1.10m when in the face of free space height equal to or higher than 24m (including mid-highrise buildings);

Note: Height of railing shall be vertical height calculated from floor or roof surface to top of railing, and it shall be calculated from top surface of step position, if it existed at the bottom with width not less than 0.22m and height not larger than 0.45m.

3 Clearance should not be left within 0.10m height of railing from surface of floor or roof;

4 Construction preventing children climbing must be adopted for railings in residences, nursery, kindergarten, primary/secondary school and special locations for children, and clearance between rail posts shall be not larger than 0.11m when railing with rail post is adopted;

5 Clearance between rail posts shall be not larger than 0.11m when railing with rail posts is adopted in the location permitting children entering into, such as recreation buildings, commercial service buildings, buildings for sports and landscape.

6.7 Staircase

6.7.1 Number, position, width and form of staircase shall fulfill the requirements of convenient to use and safety for evacuation.

6.7.2 On top of comply with provisions in code of fire proofing, the horizontal distance between wall surface and center line of handrail or between handrails, namely the width of staircase, for daily major traffic shall be decided according to the usage characters of building and determined by the number of pedestrian flow of 0.55+(0~0.15)m, and the number shall not less than two. 0~0.15m is oscillation amplitude of human body in marching pedestrian flow, and upper limit value shall be taken for public buildings with crowd pedestrian flow.

6.7.3 Minimum width of stair landing at turning end of railing shall be not less than width of staircase, and not less than 1.20m. The width shall be properly widened if required for conveying of large-scale articles.

6.7.4 The number of foot steps for each stair flight shall be not larger than 18 and also not less than 3.

6.7.5 Clear height passage above and below stair landing shall be not less than 2m, and clear height of stair horse flight shall be not less than 2.20m.

Note: Clear height of stair flight is vertical height from front edge of foot step (including the range in 0.30m out of front edge of the lowest and highest foot step) to bottom edge of above overhanging part.

6.7.6 Railing shall be set at least at one side of stair, it shall be set on both sides when clear width of stair flight reaches three pedestrian flows, and middle handrail should be set when it reaches four pedestrian flows.

6.7.7 Railing height of indoor stair measured from front edge of foot step should be not less than 0.90m, and when horizontal railing set along one side of stair well with length exceeds 0.50m, the railing height shall be not less than 1.05m.

6.7.8 Slip-resistance measures shall be taken for foot step.

6.7.9 Measures to prevent children from climbing and sliding must be adopted for stairs in nursery, kindergarten, primary/secondary school and special locatons for children when clear width of stair well exceeds 0.20m, and structures hard to climb shall be adopted for railing of stair. Clearance between rail posts shall be not larger than 0.11m when railing with rail posts is adopted.

6.7.10 The ratio of height and width for foot step of staircase shall be in accordance with those specified in Table 6.7.10.

Table 6.7.10 Minimum width and maximum height of foot step of staircase (m)

Category of staircase	Minimum width	Maximum height
Public staircase for residential buildings	0.26	0.175
Staircase for kindergarden or primary school	0.26	0.15
Staircase for cinema, theater, gymnasium, market, hospital, hotel, university and middle school	0.28	0.16
Staircase for other buildings	0.26	0.17
Special dispersal staircase	0.25	0.18
Service staircase, staircase in residential suite	0.22	0.20

Note: Foot step width of spiral stair without center post and curved stair at 0.25m from inside railing center shall be not less than 0.22m.

6.7.11 Special service staircase for old person, disabled person and other special purpose shall comply with provisions of design code for specific buildings.

6.8 Elevator, Escalator and Moving Walkway

6.8.1 Elevator setting shall be in accordance with the following requirements:

1 Elevator shall not be reckoned in emergency opening;

2 The number of elevators for each building shall be not less than 2 for high-rise public buildings, high-rise residential buildings of 12 stories or more with elevator as main vertical traffic tools;

3 In each service area of buildings, elevators in unilateral arrangement shall not exceed 4, and elevators in bilateral arrangement shall not exceed 2×4. Elevator shall not be arranged closely at corner;

4 Depth of elevator hall shall be in accordance with those specified in Table 6.8.1, and shall be not less than 1.50m;

Table 6.8.1 Depth of elevator hall (m)

Category of staircase	Arrangement way	Depth of elevator hall
Residential elevator	Single	$\geqslant B$
	Unilateral arrangement for multiple elevators	$\geqslant B*$
	Bilateral arrangement for multiple elevators	$\geqslant$Sum of $B*$ of opposite elevator and $\leqslant$3.50m
Elevator for public buildings	Single	$\geqslant 1.5B$
Buildings	Unilateral arrangement for multiple elevators	$\geqslant 1.5B*$, and $\geqslant$2.40m when the number of elevator is 4
	Bilateral arrangement for multiple elevators	$\geqslant$Sum of $B*$ of opposite elevator and $\leqslant$4.50m
Elevator for sickbed	Single	$\geqslant 1.5B$
	Unilateral arrangement for multiple elevators	$\geqslant 1.5B*$
	Bilateral arrangement for multiple elevators	$\geqslant$Sum of $B*$ of opposite elevator

Note: B is depth of cab, and $B*$ is maximum depth of cab in multiple elevators.

5 Shaft and machine room of elevator should not be arranged closely neighboring to rooms with silent requirements, otherwise vibration isolation and sound insulation measures shall be taken;

6 Machine room shall be specific room, and heat preservation or thermal insulation measures shall be taken for envelop construction, the room inside shall be well ventilated, dustproof and should have natural daylighting. Top slab of machine room cannot be used as bottom slab of water tank, and water pipe or steam pipe cannot pass through the room directly;

7 Arrangement of firefighting elevator shall comply with provisions of code of fire proofing.

6.8.2 Escalator and moving walkway shall be in accordance with the following requirements:

1 Escalator and moving walkway shall not be reckoned in emergency opening;

2 Width of traffic area before entrance and exit shall be not less than 2.50m, and it shall be widened if there are high-density pedestrian flow;

3 Guard board shall be flat, smooth and free of outshoot; vertical height from top of hand strap to front edge of escalator, foot plate or tape surface of moving walkway shall be not less than 0.90m, distance between outer surface of hand strap and any obstacles shall be not less than 0.50m, otherwise effective measures shall be taken to pre-

vent people from the damage of obstacles;

4 Distance between center line of hand strap and parallel wall surface or the edge of floor slab opening, as well as horizontal distance between center lines of hand straps of two adjacent walkways under parallel crossing arrangement, shall be not less than 0.50m, otherwise effective measures shall be taken to prevent people from the damage of obstacles;

5 Vertical clear height shall be not less than 2.30m above ladder step of escalator, foot plate or tape of moving walkway;

6 Inclined angle of escalator shall not exceed 30°, and it is permitted to increase to 35° when lifting height not exceed 6m, and nominal speed is not larger than 0.50m/s; inclined angle of inclined moving walkway shall not exceed 12°;

7 Accordant staircase shall be arranged closely when escalator or moving walkway between stories is one-way set;

8 Intercommunicated space between stories formed by seting of escalator or moving walkway shall meet the requirements of fire-protection zoning and relative provisions in codes of fire proofing.

6.9 Wall and Deformation Joint

6.9.1 New-type building wall material shall be adopted for wall based on local conditions.

6.9.2 Thermal insulation, heat prevention and damp proofing measures shall be taken for external wall according to local climate and building requirements.

6.9.3 Damp proofing of wall shall be in accordance with the following requirements:

1 Continuous horizontal damp proofing layer shall be set for masonry wall above outdoor ground and at indoor ground cushion; additional damp proofing layer shall be set for lateral surface of wall at altitude difference position when there are altitude difference between adjacent indoor grounds;

2 Dampproof layer shall be set for external wall and inside of internal wall for damp room;

3 Dado shall be set for indoor wall surface according to water proofing, damp proofing, antifouling and collision preventing requirements if necessary.

Note: Dampproof layer in seismic region shall meet requirements of earthquake-proof integral connection for buildings.

6.9.4 Measures to prevent climbing into house shall be adopted for overhang on external wall of buildings, such as window sill, bay window, balcony, shelf for air conditioner, rain pipe, vent pipe and decorative band.

6.9.5 External wall shall prevent crack due to deformation, reinforcement measures shall be taken at openings, windows and etc..

6.9.6 Deformation joint setting shall be in accordance with the following require-

ments:

1 Deformation joint shall be designed according to characters and conditions of the joint, it shall not has resistance and not be damaged when displaycement or deformation arises, and at the same time not damaged to the building.

2 Measures of waterproofing, drainage, firefighting, heat preservation, aging resistance, corrosion prevention, moth proofing and prevention of break off and etc. shall be taken for structures and materials of deformation joint according to position requirements.

6.10 Door and Window

6.10.1 Products of door and window shall be in accordance with the following requirements:

1 Materials, dimensions, functions and quality of door and window shall comply with usage requirements and specifications of product standard of door and window for building;

2 Fittings of door and window shall match with their main body, and comply with technical requirements of various materials;

3 Door and window for building with good performances in energy conservation, sealing, noise insulation and dewfall prevention shall be popularized for their widespread application.

Note: Door and window processing dimensions shall be the clear dimensions, namely design dimensions of door and window openings mianus the thickness of finishing materials for wall surface.

6.10.2 Connections between door and/or window and wall shall be firm, and satisfy requirements of air pressure resistance, water-tightness and air-tightness, and corresponding sealing materials shall be selected for door and window of different materials.

6.10.3 Window setting shall comply with following provisions:

1 The opening form of window sash shall be convenient to use, safe, and easy to maintain and clean;

2 Reinforcement measures shall be taken for window sash when outward opening window is adopted;

3 Bottom height of window sash opening toward public walkway shall be not less than 2m;

4 Protective measures shall be taken for sills toward open-air and lower than 0.80m, the protective height shall be not less than 0.80m calculated from surface of floor;

5 Window opening shall be set according to code of fire proofing when it must be set on fire-proof wall;

6 Transparent materials able to prevent from fragmentation and damaging human

body shall be adopted for skylight;

7 Measures shall be taken for skylight to prevent condensed water generation or drain out condensed water;

8 Skylight shall be easy to open, close and fix, leakage proofing, and convenient to clean.

Note: 1 Protective measures shall be taken when window sill for residence is lower than 0.90m;

2 Protective height of guard rail close to window or fixed window shall be calculated from window sill surface when low window sill, bay window and etc, below where, there are wide window sill for human standing.

6.10.4 Door setting shall be in accordance with the following requirements:

1 External door construction shall be convenient to open, solid and durable;

2 Door stop device shall be provided for manual open gate, and derail preventive measures shall be taken for horizontal sliding door;

3 Transparent safe glass shall be mounted at visible height for double acting spring door;

4 Side hung egress door shall be set adjacent to or on revolving door, motor-driven door, roller shutter and large-scale door;

5 The door leaf of door with opening direction toward egress walkway and staircases, its door leaf shall not influence width of egress walkway and stair landing when complete opened;

6 Safety glass or effective measures shall be adopted for complete glazed door and symbol of caution to avoid impact shall be set;

7 Door opening shall not go across deformation joints.

6.11 Building Curtain Wall

6.11.1 Technical requirements of building curtain wall shall be in accordance with the following requirements:

1 Section materials, sheet materials, sealing materials, metal accessories and fittings adoped in building curtain walls shall comply with provisions of current relevant standards;

2 Physical properties of curtain wall: wind load deformation, rain leakage, air leakage, thermal insulation, sound insulation, impact resistance, in-plane deformation, fire-protection, lightning proofing, vibration resistance and optical performance, shall comply with provisions of current relevant standards.

6.11.2 Glass curtain wall shall be in accordance with the following requirements:

1 Glass curtain wall used for aseismatic area and building height shall comply with provisions of relevant codes;

2 Safety glass with impact resistance performance shall be adopted for glass curtain wall;

3 Segregation of glass curtain wall shall be firmly connected with floor slab, beam and/or partition wall, and comply with requirements of fire protection division;

4 Opening area of glass window sash shall be fixed with sufficient safety according to specs of curtain wall materials and requirements of air-vent.

6.12 Flooring

6.12.1 Basic construction courses of ground floor should be surface finishing course bedding course and foundation; basic construction courses of storey floor should be surface finishing course and floor slab. When basic construction of ground or storey floor can't fulfill usage or constructure requirements, binding course, separation layer, filling course, leveling blanket and heat insulaton also other construction courses should be added.

6.12.2 Except for special application requirements, flooring shall be even, wearable, free of dust emission, slip resistant, pollutant resistant, noise proofing, and convenient to clean.

6.12.3 Waterproof and slip resistance finishing flooring shall be adopted for toilet, bath room, kitchen and similar positions with floor usually often soaked by water or non-corrosive liquid, and these flooring shall be lower than adjacent floor surface and drainage slope inclined to waste crating shall be set; waterproof layer must be set for toilet, bath room and building floor with waterproof requirements; cast-in-place concrete or one-piece precast concrete slab with concrete strength grade not less than C20 must be adopted for floor structure; concrete flanging shall be constructed around floor except for door openings, and its height shall be not less than 120mm.

Flooring usually under water flush shall be lower than adjacent flooring, or adopt doorsill and the like water-retaining measures, and also drainage measures shall be taken. Water resistant, easy-to-flush and slip resistant surface materials shall be adopted for flooring, and waterproof layer shall be set.

6.12.4 Measures of damp proofing, frost expansion prevention for foundation soil and uneven subsidence prevention shall be taken for ground floor built on foundation soil according to requirements.

6.12.5 For the rooms used as storage of food, foodstuff, seed or medicament and when its stored materials directly contacted with floor, it is strictly forbidden to use toxic materials as flooring, and the toxicity of materials used shall be identified by relevant hygiene and disease control departments. Flooring materials with peculiar smeel emitting shall be prevented when it is used to store food with strong absorptivity.

6.12.6 Recoverable rigid materials composed of plate, block materials and concrete, or flexible structures composed of grain and lime earth shall be adopted for flooring

bearing heavy load or impact force, according to usage properties and location.

6.12.7 Corresponding measures for fire-resisting, corrosion-proof, damp proofing, moth proofing and/or ventilation shall be taken for wooden flooring according to usage requirements.

6.12.8 Thermal insulation measures may not be adopted for flooring in heating rooms, but locally thermal insulation measures shall be taken if one of the following conclitions is met:

1 Overhead or cantilever floor directly affronted to outdoor or adjacent to non-heating room;

2 When no heating pipe duct is arranged around buildings in severe cold region, heat preservation measures shall be taken for ground floor in the range of 0.50～1.00m inside of external wall, and its thermal resistance shall be not less than that of out wall.

6.13 Building Curtain Wall

6.13.1 Protection grade of roof work shall be determined according to properties, important degree and usage functions of buildings as well as rational service year of waterproof layer, combined with project characters and regional natural conditions.

6.13.2 Drainage gradient of roof shall be determined according to roof structure form, roof substratum category, waterproof construction form, performance of materials and local climate, and shall be in accordance with those specified in Table 6.13.2.

Table 6.13.2 Drainage gradient of roof

Roof category	Drainage gradient of roof (%)
Flat roof deck with waterproof roll-roofing, rigid waterproof	2～5
Book tile	20～50
Corrugated tile	10～50
Bituminized tile	≥20
Space frame, suspended cable structure with metal plate roofing	≥4
Profiled sheet	5～35
Planting soil roof	1～3

Note: 1 Slopes made by structure and material shall be not less than 3% and 2% for flat roof deck, respectively;

2 Slope of roll-roofing shall be not larger than 25%, and fix-up and anti-sliding measures shall be taken when its slope exceeds 25%;

3 Longitudinal slope of valley gutter and eaves gutter shall be not less than 1% for roll-roofing, water fall head shall not exceed 200mm at the bottom of gutter. Valley gutter and eaves gutter shall not flow through deformation joint and fire-protecting wall;

4 Plain tile must be firmly laid, and fix-up measures Shall be adopted for roof in earthquake-proof area or with slope larger than 50%;

5 Slopes of overhead thermal insulation roof and planting soil roof shall be not larger than 5% and 3%, respectively.

6.13.3 Roofing construction shall comply with following provisions:

1 Noncombustible materials shall be adopted for roof surface layer, including projection and added storey of roof, but combustible roll-roofing materials can be used on incombustible roof substratum for fire-proof grade 1 and 2 buildings;

2 Outlet drainage system should be preferable adopted for roof drainage; internal drainage system should be adopted for high-rise building, multi-span roof and roof with large catchments area; the number and diameter of down pipe for roof water shall be determined by check computation (calculation);

3 Cooresponding waterproof reinforcement measures shall be taken for valley gutter, eaves gutter, cornice, fall trap, flashing, deformation joint and pipe protruded out of roof according to project characters, and shall meet the requirements of relevant code;

4 Fix-up and anti-sliding measures shall be taken for roof when its slope or roof fall is relatively high; plain tile must be laid firmly;

5 Fix-up and reinforcement measures shall be taken in earthquake-proof region or the region under strong wind;

6 Thermal check computation shall be carry out for roof with heat insulation, and measures to prevent dewfall, steam penetration, as well as prevention of insulation material affected with damp during construction shall be taken;

7 For roof with overhead thermal insulation layer, the determination of height of overhead insulation layer shall depends on width or slope of roof, and overhead layer mustn't be blocked. Ventilation roof ridge shall be set when roof width is larger than 10m; heat insulation layer of proper thickness should be provided on roof substratum;

8 Protective measures for efflorescence resistance and erosion resistance shall be taken for roof board made of mesh-reinforced cement or reinforcement concrete thin-walled member; crack resistant measures shall be provided for rigid waterproof roof;

9 Inspection manhole to roof shall be set when no stair is available to roof, or external wall access ladder shall be set for roof height lower than 10m. Effective measures shall be taken for safe guarding and preventing children from climbing;

10 Ventilation hole and inspection manhole shall be provided for blind loft; fire protecting partition wall shall be set in blind loft.

6.13.4 Construction of suspended ceiling shall be in accordance with the following requirements:

1 Safe construction measures shall be taken for the suspension between suspended ceiling and main structure; maintenance space shall be left in suspended ceiling of tall big hall; and maintenance walkway and manhole to be convenient to enter into suspended ceiling shall be set according to requirements and shall comply with relevant fire-

fighting and safety requirements;

2 When quite a lot number of pipelines are set in suspended ceiling and limited space is impossible for man to enter in for maintenance, dismountable prefabricated suspended ceiling board may be adopted, or maintenance hand hole may be set in necessary position;

3 Anti-condensation measures shall be taken when water supply and drainage pipelines are laid in suspended ceiling;

4 Waterproof materials and anti-condensaation measures of anti-condensaation and prevent dewdrop shall be taken for suspended ceiling of wet room; cast-in-place concrete board should be taken for reinforced concrete top board.

6.14 Pipe Shaft, Smoke Flue, Vent shaft and Garbage Shaft

6.14.1 Pipe shaft, smoke flue, vent shaft and garbage shaft shall be independently set and shall not be incorporated in one pipe system. In addition, they shall be made of non-combustible materials.

6.14.2 Pipe shaft setting shall be in accordance with the following requirements:

1 Sectional dimensions of pipe shaft shall meet requirements of space for pipe installation and maintenance;

2 Access door or dismountable wall board should be set for pipe shaft at the side adjacent to public walkway in each storey;

3 Pipes with influences on each other in safety, fire protection and sanitation shall not be laid in the same shaft;

4 Shaft wall, access door and shaft opening of pipe shaft shall meet the requivements of code of fire proofing.

6.14.3 Section, shape, dimensions and inner wall of smoke flue and air relief shaft shall be convenient for unhindered smoke emission and preventing the phenomena of retardation, eddy current, wallop, air leakage and blow-in smoke.

6.14.4 Smoke flue and air relief shaft shall be protruded out of roof with height in favor of smoke diffusion, and shall be determined according to roof form, height and distance of obstacle around exhaust opening, and snow thickness. Protruding height shall be not less than 0.60m for flat roof and not below the height of parapet. Protruding height of pitched roofs shall be in accordance with the following requirements:

1 Center line of smoke flue and air relief shaft shall be 0.60m higher than roof ridge when their distance is less than 1.50m;

2 Center line of smoke flue and air relief shaft shall be higher than roof ridge and its protruding height out of roof shall be not less than 0.60m, when the distance between center line and roof ridge is between 1.50～3.00m;

3 When distance between center line of smoke flue (and air relief shaft) and roof ridge is larger than 3m, the angle between the connecting line from their top to roof ridge and horizontal line shall be not larger than 10°, and its protruding height out of roof shall be not less than 0.60m.

6.14.5 Garbage shaft should not be set in civil building. Effective measures corresponding to garbage collecting method shall be set for multi-storey building without garbage shaft. Enclosed garbage classification, storage and collection space equipped with rinsing and drainage measures should be set in each storey for mid-high and high-rise buildings without garbage shaft.

6.14.6 In case of setting of garbage shaft, it shall be in accordance with the following requirements:

1 Garbage shaft should be arranged close to external wall with main body protruded out of roof, and top cap, grill and flow backward resistant measures shall be provided for protruding out part;

2 Sanitary isolation measures shall be provided at garbage exit, and the way of bottom storage and transportation of garbage shall be corresponding to domestic garbage management system;

3 Interal surface of garbage shaft shall be smooth and free of outshoot;

4 Garbage hopper shall be made of noncombustible and corrosion resistant materials, At the same time, the hopper could automatically close and seal; garbage hopper for high-rise, superhigh-rise building shall be set in front room of garbage shaft, and Class Ⅲ fire-proof door shall be adopted for the front room.

6.15 Interior and exterior Decoration

6.15.1 Interior and exterior decoration shall be in accordance with the following requirements:

1 Interior and exterior decoration must not cause damage to the safety of building structure;

2 Energy saving and green building materials shall be adopted for interior and exterior decoration;

3 Fire-proof, pollution resistance, damp proof, waterproof as well as noxious gas and radial controlling decoration and auxiliary material shall be adopted for interior and exterior decoration work according to different usage requirements;

4 Interior and exterior decoration for buildings under preservation shall meet the requirements of relevant building preservation ordinances.

6.15.2 Interior decoration shall be in accordance with the following requirements:

1 Interior decoration shall not cover fire symbols, evacuation indicatory signs and

fire escape, at the same time, shall not influence the normal use of firefighting facilities and egress walkway;

2 Renovation of internal decoration when necessary, shall not make optional changes of existing facilities, equipments and pipeline system.

6.15.3 Exterior decoration shall comply with following provisions:

1 Exterior wall decoration must be firmly connected with main structure;

2 Exterior thermal insulation materials of external wall shall be firmly connected with main structure and external wall veneer, and effective measures shall be taken for crack prevention, waterproofing, frost prevention, corrosion resistance, efflorescence prevention and break off prevention;

3 External wall decoration shall prevent environment pollution due to intense light reflection.

7 Indoor Environment

7.1 Daylighting

7.1.1 Calculation of daylight factor shall be carried out for various buildings, and standard value of daylight factor shall be in accordance with the following requirements.

1 Standard value of daylight factor of residential building shall be in accordance with those specified in Table 7.1.1-1.

Table 7.1.1-1 Standard value of daylight factor of residential building

Daylight grade	Room name	Lateral daylighting	
		Minimum value of daylight factor C_{min}(%)	Critical illuminance of interior daylight (lx)
Ⅳ	Living room, bedroom, study room, kitchen	1	50
Ⅴ	Toilet, hall, stair well, dining room	0.5	25

2 Standard value of daylight factor of office building shall be in accordarce with those specified in Table 7.1.1-2.

Table 7.1.1-2 Standard value of daylight factor of office building

Daylight grade	Room name	Lateral daylighting	
		Minimum value of daylight factor C_{min}(%)	Critical illuminance of interior daylight (lx)
Ⅱ	Design room, drafting room	3	150
Ⅲ	Office, video studio, meeting room	2	100
Ⅳ	Copying room, filing room	1	50
Ⅴ	Walkway, stair well, toilet	0.5	25

3 Standard value of daylight factor of school building shall be in accordarce with those specified in Table 7.1.1-3.

Table 7.1.1-3 Standard value of daylight factor of school building

Daylight grade	Room name	Lateral daylighting	
		Minimum value of daylight factor C_{min}(%)	Critical illuminance of interior daylight (lx)
Ⅲ	Class room, lecture theater, laboratory, auditorium	2	100
Ⅴ	Corridor, stair well, toilet	0.5	25

4 Standard value of daylight factor of library building shall be in accordarce with those specified in Table 7.1.1-4.

Table 7.1.1-4 Standard value of daylight factor of library building

Daylight grade	Room name	Lateral daylighting		Top daylighting	
		Minimum value of daylight factor C_{min}(%)	Critical illuminance of interior daylight (lx)	Average value of daylight factor C_{av}(%)	Critical illuminance of interior daylight (lx)
Ⅲ	Reading room, open-shelf stack room	2	100	—	—
Ⅳ	Catalogue room	1	50	1.5	75
Ⅴ	Stack room, cooridor, stair well, toilet	0.5	25	—	—

5 Standard value of daylight factor of hospital building shall be in accordarce with those specified in Table 7.1.1-5.

Table 7.1.1-5 Standard value of daylight factor of hospital building

Daylight grade	Room name	Lateral daylighting		Top daylighting	
		Minimum value of daylight factor C_{min}(%)	Critical illuminance of interior daylight (lx)	Average value of daylight factor C_{av}(%)	Critical illuminance of interior daylight (lx)
Ⅲ	Consulting room, drugstore, room for medical treatment, laboratory	2	100	—	—
Ⅳ	Waiting room, registry, hall in general, ward, doctor office (nurses room)	1	50	1.5	75
Ⅴ	Walkway, stair well, toilet	0.5	25	—	—

Note: Standard values of daylight factor listed in Table 7.1.1-1 to 7.1.1-5 are suitable for Grade Ⅲ daylight climate region. Standard values of daylight factor in other regions shall be multiplied with daylight climate coefficient of corresponding region.

7.1.2 Calculation of effective daylighting area shall be in accordarce with the following requirements:

1 The part of side window daylight opening below 0.80m from floor surface shall not be reckoned in effective daylighting area;

2 For side window daylight opening under overhanging obstruction such as side corridor, balcony with effective width larger than 1m, its effective daylighting area shall be calculated by 70% of daylight opening area;

3 For flat skylight, its effective daylighting area shall be calculated by 2.50 times of lateral daylight opening area.

7.2 Ventilation

7.2.1 Windows or openings directly vented to outdoor atmosphere shall be provided in buildings, otherwise natural ventilation tunnel or mechanical ventilation facilities shall be set.

7.2.2 For room with direct natural ventilation, its ventilation opening area shall be in

accordarce with the following requirements:

1 Effective area of ventilation opening in living or working room shall be not less than 1/20 of floor area of the room;

2 Effective area of ventilation opening in kitchen shall be not less than 1/10 of floor area of the room and 0.60m^2; oil fume removal equipment and flue pipe shall be set above cooking range of kitchen.

7.2.3 Natural ventilation tunnel or ventilation equipment shall be set for living room, kitchen and toilet in severe cold region.

7.2.4 Mechanical ventilation facilities and ventilation tunnel shall be set for bath room without outer window and toilet.

7.2.5 Air-inlet shutter shall be set at, or air-inlet aperture shall be set aside the bottom of door of kitchen or toilet.

7.2.6 Natural ventilation tunnel shall be located at opposite side of window or air-inlet opening.

7.3 Thermal Preservation

7.3.1 Building shall be arranged with a sunny exposure, without barrier of sunlight, and at lee locality.

7.3.2 The shape of building with heating system shall reduce external surface area.

7.3.3 For buildings in severe cold region, external thermal insulation technology with enclosing construction should be adopted, open staircase and side corridor shall not be setup. Air-lock or other winter proofing measures shall be set at entrance and exit. For buildings in cold region, open staircase and side corridor should not be setup, Air-lock or other winter proofing measures should be set at entrance.

7.3.4 The length of the slot joint of external door and window of buildings, shall be lessened, and sealing measures shall be taken. Energy saving external door and window should be adopted.

7.3.5 For buildings with central heating in severe cold and cold region, the building thermal property and heating design shall comply with provisions of relevant energy conservation design standards.

7.3.6 Energy conservation design for buildings in region of hot summer and cold winter as well as region of hot summer and warm winter shall meet the requirements of relevant energy conservation design standards.

7.4 Thermal Prevention

7.4.1 Buildings with thermal prevention in summer shall be in accordarce with the following requirements:

1 Comprehensive measures of greening environment, effective natural ventilation, insulation of envelop construction, and set-up sunshade shall be taken for buildings with heat prevention in summer;

2 General layout of buildings, plane and space organization of building, section design as well arrangement of door and window shall all be in favor of organization of indoor ventilation;

3 Effective sunshade and heat prevention measures shall be taken for east window, west window, external wall and roof of buildings;

4 Heat prevention design for summer shall be carried out for envelop construction of buildings, and comply with provisions of relevant energy conservation design standards.

7.4.2 Buildings with air conditioning shall be in accordarce with the following requirements:

1 The shape of the building shall in favor of lessening exposure surface area of building;

2 Air conditioning rooms shall be arranged relatively concentrated;

3 External windows of air conditioning room shall be well in air tightness and heat insulation performance. Sunshade should be set for sunny widows, and energy conservation windows should be adopted;

4 Positions of outdoor air conditioning machines shall be designed and installed uniformly for buildings with non-centralized air conditioning facilities. and organized drainage shall be set for discharge of condensted water;

5 For intermitting air conditioning buildings, light materials should be adopted for inside and outside of envelop construction; for continuous air conditioning buildings, heavy materials should be adopted for inside and outside of envelop construction;

6 Enevelop construction of buildings shall meet the requivements of relevant energy conservation design standards.

7.5 Sound Isolation

7.5.1 Indoor allowable noise grade for various rooms in civil buildings shall be in accordarce with those specified in Table 7.5.1.

Table 7.5.1 Indoor allowable noise grade (daytime)

Category of buildings	Room name	Allowable noise grade (Sound level A, dB)			
		Super grade	Grade 1	Grade 2	Grade 3
Residence	Bedroom, study room	—	≤40	≤45	≤50
	Sitting room	—	≤45	≤50	≤50
School	Room with special silent requirement	—	≤40	—	—

Table 7.5.1 (Continued)

Category of buildings	Room name	Allowable noise grade (Sound level A, dB)			
		Super grade	Grade 1	Grade 2	Grade 3
School	Common classroom	—	—	≤50	—
	Room without special silent requirement	—	—	—	≤55
Hospital	Ward and rest room for medical personnel	—	≤40	≤45	≤50
	Clinic	—	≤55	≤55	≤60
	Operating room	—	≤45	≤45	≤50
	Audiometric test room	—	≤25	≤25	≤30
Hotel	Guest room	≤35	≤40	≤45	≤55
	Meeting room	≤40	≤45	≤50	≤50
	Multifunctional hall	≤40	≤45	≤50	—
	Office	≤45	≤50	≤55	≤55
	Dining room, banquet hall	≤50	≤55	≤60	—

Note: Indoor allowable noise grade value in night time is 10dB (A) lower than that in day time.

7.5.2 Airborne sound isolation standard for envelop construction of different rooms (partition wall, floor slab) shall be in accordarce with those specified in Table 7.5.2.

Table 7.5.2 Airborne sound isolation standard

Category of buildings	Room name	Allowable noise grade (Sound level A, dB)			
		Super grade	Grade 1	Grade 2	Grade 3
Residence	Wall between units, floor slab	—	≥50	≥45	≥40
School	Partition wall, floor slab	—	≥50	≥45	≥40
Hospital	Between wards	—	≥45	≥40	≥35
	Between wards and noise generating room	—	≥50	≥50	≥45
	Between operating room and wards	—	≥50	≥45	≥40
	Between operating room and noise generating room	—	≥50	≥50	≥45
	Enclosing construction for audiometric test room	—	≥50	≥50	≥50
Hotel	Baffle room between guest rooms	≥50	≥45	≥40	≥40
	Partition wall (including door) between guest room and corridor	≥40	≥40	≥35	≥30
	External wall of guest room (including window)	≥40	≥35	≥25	≥20

7.5.3 Impact sound insulating standard for floor slab of different rooms shall be in accordarce with those specified in Table 7.5.3.

Table 7.5.3 Impact sound isolation standard

Category of buildings	Floor slab position	Weighted standardized impact sound pressure level (dB)			
		Super grade	Grade 1	Grade 2	Grade 3
Residence	Between units in different stories	—	≤65	≤75	≤75
School	Between classroom	—	≤65	≤65	≤75

Table 7.5.3 (Continued)

Category of buildings	Floor slab position	Weighted standardized impact sound pressure level (dB)			
		Super grade	Grade 1	Grade 2	Grade 3
Hospital	Between wards	—	≤65	≤75	≤75
	Between operating room and sickroom	—	—	≤75	≤75
	Upper part of audiometric test room	—	≤65	≤65	≤65
Hotel	Between guest rooms	≤55	≤65	≤75	≤75
	Between guest room and impacting room	≤55	≤55	≤65	≤65

7.5.4 Noise isolation and reduction design of civil buildings shall be in accordarce with the following requirements:

1 For civil buildings with strong structural integrity, the measures to prevent structural sound transmission shall be taken on sound transmission source parts attached to wall body and floor slab;

2 Sound isolation, vibration insulation and sound absorbing measures shall be taken for mechanical room with noise and vibration, and vibration damping and noise elimination treatment shall be adopted for equipments and pipes. In plain arrangement, mechaanical room with noise and vibration should not be directly set above or adjacent to main room, and they shall be arranged at different sections when they are at same storey;

3 When there are suspended ceiling in rooms with high requirements of silent, the partition walls in these room shall be built up to bottom surface of beam or floor slab; when light weight partition wall is used, its sound isolation performance shall meet the requirements of relevant sound insulation standards.

8 Building Facilities

8.1 Water Supply and Drainage

8.1.1 Water supply and drainage design for civil buildings shall meet the requirements of living and firefighting.

8.1.2 Potable water quality shall meet the requirements of current national sanitary standards for potabole water.

8.1.3 Water basin (tank) for drinking water shall be separated from water basin (tank) for water of other applications.

8.1.4 Independent structure form shall be adopted for potable water basin (tank) in buildings, and main building structure member shall not be utilized as wall slab, bottom slab or top plate of water basin (tank). Construction materials, lining materials and interal wall coating of potable water basin (tank) shall not has influence on water quality.

8.1.5 Pollution sources such as septic tank, sewage treatment installation, penetrating well and garbage dumps shall not be set within 10m around underground storage tank for potable water, and sewage pipe and pollutants shall not appear within 2m around the tank.

8.1.6 Water supply design for buildings shall be in accordarce with the folloing requirements:

1 Water supply should be devided into separate system based on water quality, reusing water supply system shall be preferentially adopted;

2 Water saving sanitary ware and water faucet shall be adopted;

3 Household water meter shall be set for metering for residence, and separate water meter shall be set for different users of public buildings;

4 Water pressure of domestic potable water supply system and firefighting water supply system in buildings shall meet the requirements of water supply and drainage design code and code of fire proofing;

5 Directly-drinking water pipeline system may be mounted for newly-built residential and public buildings where conditions permitted.

8.1.7 Building drainage shall be discharged according to separate drainage principles for rainwater and domestic drainage, and water reuse system shall be set according to relevant national or local regulations.

8.1.8 In water resources shortage region, rain water resources in building district and on roof shall be sufficiently developed and utilized, and rain water shall be properly pre-

treated first, then be utilized in the method of infiltration or storage after proper pretreatment on the basis of local conditions.

8.1.9 Drainage pipe shall not be arranged above mess hall, and operation, cooking and staple food and non-taple food preparation positions in catering industry, and also shall not cross above potable water tank.

8.1.10 Indoor water supply and drainage pipe shall not be arranged above raw materials, product and equipments that may burn and/or explode when contacted with water.

8.1.11 Drainage stack pipe mustn't traverse rooms with high requirements in sanitation and quiet, such as bedroom and ward. It also should not be arranged near internal wall adjacent to bedroom.

8.1.12 Water supply and drainage pipe shall not cross switching and transformer room filing room, elevator machine room, communication machine room, large and medium-scale computer networking center, audio-visual materials storage, etc., where water will damage equipments and/or cause accident.

8.1.13 Waterproof measures shall be taken where water supply and drainage pipe cross through external wall of basement or underground constructions.

8.1.14 Water supply and drainage pump room shall not be set above, below or adjacent to the room with quiet requirements; drainage facilities shall be set in pump room, and waterproof layer shall be set on floor; vibration and noise prevention measures shall be taken in pump room. Firefighting pump room shall meet the relevant requirements of code of fire proofing.

8.1.15 Low-noise product shall be adopted for water supply and drainage equipments and pipes, such as sanitary ware, water pump and cooling tower.

8.2 Heating, Ventilation and Air Conditioning

8.2.1 Design for heating, ventilation and air conditioning as well as their cold and heat source system in civil building shall meet the requirements of safety, sanitation and building functions.

8.2.2 Indoor air design parameters and its sanitary requirements shall meet the requirements of current national standard "Code for Design Heating Ventilation and Air Conditioning" GB 50019 and other relevant standards.

8.2.3 Heating design shall be in accordarce with the following requirements:

1 Hot water should be adopted as heat transfer medium for heating system of civil buildings;

2 Prerequisite for heat supply metering shall be provided for heating system of residential building;

3 Valves and meters for adjustment, check and maintenance of central heating

system of residential buildings by professionals shall not be set in private living unit; facilities such as valves and meters and etc, used for other living units shall not be set in a private living unit;

4 Radiator, pipe and connecting fittings of heating system shall meet requirements of system pressure.

8.2.4 Ventilation system shall be in accordarce with the following requirements:

1 Air inlet for mechanical ventilation system shall be set in the position with fresh and clean outdoor air;

2 Exhaust gas shall not be let out into the region with human retention or passing;

3 Noncombustible materials shall be selected for pipes of mechanical ventilation system;

4 Ventilation machine room should not be arranged adjacent to the room with noise limit;

5 Partition wall and the door on the wall of ventilation machine room shall meet the relevant requirements of code of fire proofing.

8.2.5 Air conditioning system shall be in accordance with the following requirements:

1 For civil building with air conditioning system, its storey height and suspended ceiling height shall meet the requirements of air conditioning system;

2 Noncombustible materials shall be selected for air conduit of air conditioning system;

3 Air conditioning machine room should not be arranged adjacent to the room with noise limit;

4 Fresh air collecting inlet of air conditioning system shall be set in the position with fresh and clean outdoor air;

5 Partition wall and door on the wall of air conditioning machine room shall meet the relevant requirements of code of fire proofing.

8.2.6 Settings of refrigerating machine, pump room, heat exchanging station for civil building shall be in accordance with the following requirements:

1 Entrance for large-scale equipment shall be obligated; and hoisting facilities shall be set at suitable position in machine room if conditions permitted;

2 Press and trowelled cement flooring should be used, and water supply and drainage facilities shall be set for flush of floor; floor scupper or drainage open channel shall be set at positions where water leakage or discharging could be happen from equipments;

3 Repair workshop, duty room, toilet, communication facility and emergency light should be set;

4 Equipment arrangement shall make certain for convenient operation and maintenance space;

5 Adverse influences caused by equipment vibration shall be prevented;

6 For room with ventilation and air renewal requirements, it shall be ensured that the indoor air flow could be generated when the door is closed, if there is only air inlet or air outlet is set in this room; for rooms with both air inlet and air outlet, their positions shall be rationally arranged to prevent short circuit of air flow.

8.2.7 The position of central boiler room for dwelling district shall prevent influence to district environment from fuel transportation, noise and pollutant discharge. Buildings, structures and site arrangement shall meet the requirements of current national standard "Code for Design of Boiler Plant" GB 50041.

8.2.8 Oil-burning and gas-burning boiler rooms (or other combustion equipment room) for civil building shall not be set in main building. Those set in main buildings, if necessary, shall meet the requirements of relevant standards, local firefighting and safety department.

8.3 Building Electricity

8.3.1 Distribution and transformer substation in civil building shall be in accordance with the following requirements:

1 Position selection for distribution and tansformer substation shall be in accordance with the following requirements:

1) It should be adjacent to power load center;

2) It shall be convenient for lines inlet and outlet;

3) It shall be convenient for equipment hoisting and transportation;

4) It shall not be set directly below toilet, bathing room and other places usually with accumulation area of water, and should not be adjacent to places mentioned above; distribution and transformer substation equiped with electrical equipments with combustible oil shall not be set above, below or adjacent to high-density people area or along both sides of egress;

5) Distribution and transformer substation shall be screened when set above or below residence, guest room and office.

2 Distribution and transformer substation equipped with combustible oil-immersed transformer with total capacity not exceeding 1260kVA and single capacity not exceeding 630kVA can be arranged adjacent to external wall in the ground floor storey or basement of main building and safety exit shall be set directly outward, Grade A fire door shall be used for transformer room; noncombustible fire-proof cantilever with width not less than 1m, shall be set above opening of external wall;

3 Fire resistance ratings of combustible oil-immersed transformer, high-voltage distribution substation, low-voltage distribution substation and load-bearing roof member shall be not lower than Grade 1, Grade 2, Grade 3 and Grade 2 respectively;

4 High- and low-voltage distribution facilities without combustible oil and non-oil-immersed transformer may be set in the same room;

5 Natural lighting fixed window with sill height from outdoor ground surface not less than 1.80m should be set for high-voltage distribution substation, and natural lighting window able to open may be set not adjacent to street for low-voltage distribution substation;

6 Exits shall be set at both ends of transformer room with length larger than 7m, and an exit shall be added when the room length is larger than 60m;

7 Door of entrance and exit of transformer room and distribution substation shall be opened outward;

8 Facilities shall be set in transformer room and distribution substation to prevent rain, snow and small animals from entering into room through lighting window, ventilation window, door and cable trench;

9 Water proofing and drainage measures shall be taken for cable interlayer, cable trench and cable room of distribution and transformer room;

10 Foreign pipes and lines shall not pass through distribution and transformer room;

11 Equipotential bonding shall be set for distribution and transformer room, control room and storey distribution room;

12 Communication interface, as well as entrance and exit control shall be set for important place, distribution and transformer substation, to communicate with outside.

8.3.2 Fire door grade of distribution and transformer room shall be in accordance with the following requirements:

1 Distribution and transformer substation in high-rise building shall be separated with other parts by partition wall with fire endurance not less than 2h, floor slab with fire endurance not less than 1.5h and Grade A fire door;

2 The door from combustible oil-immersed transformer room to distribution room or transformer room shall be Grade A fire door;

3 The internal door for internal connection of distribution and transformer room should be Grade C fire door;

4 The door of distribution substation towards outdoor shall be Grade C fire door.

8.3.3 Diesel generator room shall be in accordance with the following requirements:

1 Position selection and other requirements of diesel generator room shall meet the requirements in article 8.3.1 of this code;

2 Diesel generator house should be provided with generator room, control and distribution room, oil storage room and spare parts storage room; above-mentioned rooms may be properly combined, added or cut down based on practical conditions during design;

3 Two exits shall be set for generator, room and one of the exist shall be large enough to meet the requirements of machine set transportation, otherwise hoisting hole shall be obligated;

4 Door of entrance of generator room shall be opened outward; fire-protection measures shall be taken for door and observation window between generator room and control room or distribution room, and the door shall be opened towards generator room;

5 Diesel generator shall be set adjacent to first class load or distribution and transformer room;

6 Diesel generator room may be located at the first storey or basement of high-rise building annex, and shall be in accordance with the following requirements:

1) Diesel generator room shall be separated from other parts by partition wall with fire endurance not less than 2h or 3h, floor slab with fire endurance not less than 1.50h and Grade A fire door;

2) Oil storage room shall be set in diesel generator room with total storage amount not exceeding 8-hour quantity demanded, and the oil storage room shall be separated from generator room by fire-protecting wall; automatically close Grade A fire door shall be used if a door is necessary to be set on the fire-protecting wall;

3) Automatic fire alarm system and automatic fire extinguishing system shall be set;

4) When diesel generator room is set in the basement, in the least one side of the room shall be close to external wall, warm-air pipe and fume flue shall be extended to outdoor. Fume flue setting shall meet the requirements of environmental protection.

7 Air inlet of diesel generator room should be set opposite to generator end or along both sides of generator end;

8 Comprehensive measures consists of machine-set noise elimination and machine room sound isolation shall be adopted for diesel generator room.

8.3.4 Intelligent system machine room shall be in accordance with the following requirements:

1 The main machine rooms of intelligent system including: fire control room, security supervision center, telecommunication machine room, satellite receiving and ca-

ble television room, computer room, building appliance supervision room, cable casting and (hall) microphone room and etc..

2 Machine rooms of intelligent system may be either independently or combined set, and shall be in accordance with the following requirements:

1) Setting of fire control room and security supervision center shall comply with relevant code of fire proofing and security;

2) Fire control room and security supervision center should be set in the ground floor or basement of buildings, and shall be separated from other parts by partition wall with fire endurance not less than 2h or 3h and floor slab with fire endurance not less than 1.50h or 2h. In addition, safety exit directly towards outdoor shall be set;

3) When firefighting control room is combined with other control rooms, independent working space shall be left for firefighting equipments, and no interference between them shall be happened;

4) When security supervision center is combined with other control rooms, risk classification shall be identified by security authorized department;

5) Overhead floor, net floor, or floor wire casing should be laid for machine room of intelligent system; anti-static and dust-proof materials should be adopted; clear height of machine room shall be not less than 2.50m;

6) Indoor temperature of machine room shall be not lower than 18℃ in winter and not be higher than 27℃ in summer; indoor relative humidity shall be larger than 30% in winter and be less than 65% in summer;

7) Machine room of intelligent system shall not be set under toilet, bath room or other places usually with accumulation area of water and should not be closely neighboring to spaces mentioned above.

3 Important machine room of intelligent system shall be far away from strong magnetic field;

4 Positions and pathway for lines laying shall be obligated in preliminary design for equipment room of intelligent system;

5 Materials protection and technology protection shall be carried out for important machine room of intelligent system;

6 Lightning proof measures shall be taken according to systemic risk assessment of intelligent system with equipotential bonding.

8.3.5 Electrical shaft and intelligent system shaft shall be in accordance with the following requirements:

1 Clear width of electrical shaft in high-rise building should be not less than 0.80m when the passageway is utilized as its maintenance space as well;

2 Clear width of intelligent system shaft in high-rise building should be not less than 0. 60m when the passageway is utilized as its maintenance space as well; clear width of intelligent system shaft in multistorey building should be not less than 0. 35m when the passageway is utilized as its maintenance space as well;

3 Electric source receptacle outlet should be mounted, emergency lighting shall be mounted in electrical shaft and intelligent system shaft, and control switch should be mounted out of shaft;

4 Electrical shaft and intelligent system shaft should be set separately, and their terrace or doorsill shall be 0. 15～0. 30m higher than the surface of storey floor;

5 Noncombustible materials with fire endurance not less than 1h shall be adopted for shaft wall of electrical shaft and intelligent system shaft, and fire door grade not lower than Grade C shall be adopted for inspection door;

6 Environmental indices in electrical shaft and intelligent system shaft shall be able to ensure good running of equipments.

8.3.6 Line laying shall be in accordance with the following requirements:

1 Line laying shall meet the requirements of current national standard "Code of Acceptance of Construction Quality of Electrical Installation in Building" GB 50303;

2 Cable of intelligent system should be passed through metal pipe or laid in metal wire casing;

3 Protective cover of pipe for cables embeded in floor slab, wall and column (except for cable wire with fire-proof requirements) shall be not less than 15mm;

4 Thickness of floor slab and storey height of building shall meet required space for horizontal laying of electric cable and intelligent system cable, and shall have good combination with other specific pipes.

Explanation of Wording in This Code

1 Words used for different degrees of strictness are explained as follows in order to mark the differences in executing the requirements in this code:

1) Words denoting a very strict or mandatory requirement:
"Must" is used for affirmation; "must not" for negation.

2) Words denoting a strict requirement under normal conditions:
"Shall" is used for affirmation; "shall not" for negation.

3) Words denoting a permission of a slight choice or an indication of the most suitable choice when conditions permit:
"Should" is used for affirmation; "should not" for negation.

4) "May" is used to express the option available, sometimes with the conditional permit.

2 "Shall comply with…" or "shall meet the requirements of…" is used in this code to indicate that it is necessary to comply with the requirements stipulated in other relative standards and codes.

中华人民共和国国家标准

民用建筑设计通则

Code for design of civil buildings

GB 50352—2005

主编部门：中华人民共和国建设部
批准部门：中华人民共和国建设部
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中华人民共和国建设部公告

第 327 号

关于发布国家标准《民用建筑设计通则》的公告

现批准《民用建筑设计通则》为国家标准，编号为 GB 50352—2005，自 2005 年 7 月 1 日起实施。其中，第 4.2.1、6.6.3(1、4)、6.7.2、6.7.9、6.12.5、6.14.1 条(款)为强制性条文，必须严格执行，原《民用建筑设计通则》JGJ 37—87 同时废止。

本规范由建设部标准定额研究所组织中国建筑工业出版社出版发行。

中华人民共和国建设部

2005 年 5 月 9 日

前　言

本通则是根据建设部建标[2001]87号文的要求，在《民用建筑设计通则》JGJ 37—87的基础上修订而成的。修编组在广泛调查研究，认真总结实践经验，参考有关国际标准和国外先进标准，并在广泛征求意见的基础上，修订了本通则。

本通则的主要技术内容是：1. 总则；2. 术语；3. 基本规定；4. 城市规划对建筑的限定；5. 场地设计；6. 建筑物设计；7. 室内环境；8. 建筑设备。

修订的主要技术内容为：设计原则，设计使用年限，建筑气候分区对建筑基本要求，建筑突出物，建筑布局，室内环境；增加了术语，平面布置，建筑幕墙和室内外装修以及建筑设备等内容。

黑体字标志的条文为强制性条文，必须严格执行。

本通则由建设部负责管理和对强制性条文的解释，由中国建筑标准设计研究院负责具体技术内容的解释。

本通则在执行过程中，请各单位注意总结经验，积累资料，随时将有关意见和建议反馈给中国建筑标准设计研究院（北京市西外车公庄大街19号，邮政编码10044），以供今后修订时参考。

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1 总　　则

1.0.1　为使民用建筑符合适用、经济、安全、卫生和环保等基本要求，制定本通则，作为各类民用建筑设计必须共同遵守的通用规则。

1.0.2　本通则适用于新建、改建和扩建的民用建筑设计。

1.0.3　民用建筑设计除应执行国家有关工程建设的法律、法规外，尚应符合下列要求：

1　应按可持续发展战略的原则，正确处理人、建筑和环境的相互关系；

2　必须保护生态环境，防止污染和破坏环境；

3　应以人为本，满足人们物质与精神的需求；

4　应贯彻节约用地、节约能源、节约用水和节约原材料的基本国策；

5　应符合当地城市规划的要求，并与周围环境相协调；

6　建筑和环境应综合采取防火、抗震、防洪、防空、抗风雪和雷击等防灾安全措施；

7　方便残疾人、老年人等人群使用，应在室内外环境中提供无障碍设施；

8　在国家或地方公布的各级历史文化名城、历史文化保护区、文物保护单位和风景名胜区的各项建设，应按国家或地方制定的保护规划和有关条例进行。

1.0.4　民用建筑设计除应符合本通则外，尚应符合国家现行的有关标准规范的规定。

2 术　语

2.0.1　民用建筑　civil building

供人们居住和进行公共活动的建筑的总称。

2.0.2　居住建筑　residential building

供人们居住使用的建筑。

2.0.3　公共建筑　public building

供人们进行各种公共活动的建筑。

2.0.4　无障碍设施　accessibility facilities

方便残疾人、老年人等行动不便或有视力障碍者使用的安全设施。

2.0.5　停车空间　parking space

停放机动车和非机动车的室内、外空间。

2.0.6　建筑地基　construction site

根据用地性质和使用权属确定的建筑工程项目的使用场地。

2.0.7　道路红线　boundary line of roads

规划的城市道路(含居住区级道路)用地的边界线。

2.0.8　用地红线　boundary line of land;property line

各类建筑工程项目用地的使用权属范围的边界线。

2.0.9　建筑控制线　building line

有关法规或详细规划确定的建筑物、构筑物的基底位置不得超出的界线。

2.0.10　建筑密度　building density;building coverage ratio

在一定范围内,建筑物的基底面积总和与占用地面积的比例(%)。

2.0.11　容积率　plot ratio, floor area ratio

在一定范围内,建筑面积总和与用地面积的比值。

2.0.12　绿地率　greening rate

一定地区内,各类绿地总面积占该地区总面积的比例(%)。

2.0.13　日照标准　insolation standards

根据建筑物所处的气候区、城市大小和建筑物的使用性质确定的,在规定的日照标准日(冬至日或大寒日)的有效日照时间范围内,以底层窗台面为计算起点的建筑外窗获得的日照时间。

2.0.14　层高　storey height

建筑物各层之间以楼、地面面层(完成面)计算的垂直距离,屋顶层由该层楼面面层(完成面)至平屋面的结构面层或至坡顶的结构面层与外墙外皮延长线的交点计算的垂直距离。

2.0.15 室内净高 interior net storey height

从楼、地面面层(完成面)至吊顶或楼盖、屋盖底面之间的有效使用空间的垂直距离。

2.0.16 地下室 basement

房间地平面低于室外地平面的高度超过该房间净高的1/2者为地下室。

2.0.17 半地下室 semi-basement

房间地平面低于室外地平面的高度超过该房间净高的1/3,且不超过1/2者为半地下室。

2.0.18 设备层 mechanical floor

建筑物中专为设置暖通、空调、给水排水和配变电等的设备和管道且供人员进入操作用的空间层。

2.0.19 避难层 refuge storey

建筑高度超过100m的高层建筑,为消防安全专门设置的供人们疏散避难的楼层。

2.0.20 架空层 open floor

仅有结构支撑而无外围护结构的开敞空间层。

2.0.21 台阶 step

在室外或室内的地坪或楼层不同标高处设置的供人行走的阶梯。

2.0.22 坡道 ramp

连接不同标高的楼面、地面,供人行或车行的斜坡式交通道。

2.0.23 栏杆 railing

高度在人体胸部至腹部之间,用以保障人身安全或分隔空间用的防护分隔构件。

2.0.24 楼梯 stair

由连续行走的梯级、休息平台和维护安全的栏杆(或栏板)、扶手以及相应的支托结构组成的作为楼层之间垂直交通用的建筑部件。

2.0.25 变形缝 deformation joint

为防止建筑物在外界因素作用下,结构内部产生附加变形和应力,导致建筑物开裂、碰撞甚至破坏而预留的构造缝,包括伸缩缝、沉降缝和抗震缝。

2.0.26 建筑幕墙 building curtain wall

由金属构架与板材组成的,不承担主体结构荷载与作用的建筑外围护结构。

2.0.27 吊顶 suspended ceiling

悬吊在房屋屋顶或楼板结构下的顶棚。

2.0.28 管道井 pipe shaft

建筑物中用于布置竖向设备管线的竖向井道。

2.0.29 烟道 smoke uptake;smoke flue

排除各种烟气的管道。

2.0.30 通风道 air relief shaft

排除室内蒸汽、潮气或污浊空气以及输送新鲜空气的管道。

2.0.31 装修 decoration;finishing

以建筑物主体结构为依托，对建筑内、外空间进行的细部加工和艺术处理。

2.0.32 采光 daylighting

为保证人们生活、工作或生产活动具有适宜的光环境，使建筑物内部使用空间取得的天然光照度满足使用、安全、舒适、美观等要求的技术。

2.0.33 采光系数 daylight factor

在室内给定平面上的一点，由直接或间接地接收来自假定和已知天空亮度分布的天空漫射光而产生的照度与同一时刻该天空半球在室外无遮挡水平面上产生的天空漫射光照度之比。

2.0.34 采光系数标准值 standard value of daylight factor

室内和室外天然光临界照度时的采光系数值。

2.0.35 通风 ventilation

为保证人们生活、工作或生产活动具有适宜的空气环境，采用自然或机械方法，对建筑物内部使用空间进行换气，使空气质量满足卫生、安全、舒适等要求的技术。

2.0.36 噪声 noise

影响人们正常生活、工作、学习、休息，甚至损害身心健康的外界干扰声。

3 基本规定

3.1 民用建筑分类

3.1.1 民用建筑按使用功能可分为居住建筑和公共建筑两大类。

3.1.2 民用建筑按地上层数或高度分类划分应符合下列规定：

1 住宅建筑按层数分类：一层至三层为低层住宅，四层至六层为多层住宅，七层至九层为中高层住宅，十层及十层以上为高层住宅；

2 除住宅建筑之外的民用建筑高度不大于24m者为单层和多层建筑，大于24m者为高层建筑(不包括建筑高度大于24m的单层公共建筑)；

3 建筑高度大于100m的民用建筑为超高层建筑。

注：本条建筑层数和建筑高度计算应符合防火规范的有关规定。

3.1.3 民用建筑等级分类划分应符合有关标准或行业主管部门的规定。

3.2 设计使用年限

3.2.1 民用建筑的设计使用年限应符合表3.2.1的规定。

表3.2.1 设计使用年限分类

类 别	设计使用年限(年)	示 例
1	5	临时性建筑
2	25	易于替换结构构件的建筑
3	50	普通建筑和构筑物
4	100	纪念性建筑和特别重要的建筑

3.3 建筑气候分区对建筑基本要求

3.3.1 建筑气候分区对建筑的基本要求应符合表3.3.1的规定，中国建筑气候区划图见附录A。

表3.3.1 不同分区对建筑基本要求

分区名称		热工分区名称	气候主要指标	建筑基本要求
Ⅰ	ⅠA ⅠB ⅠC ⅠD	严寒地区	1月平均气温 ≤-10℃ 7月平均气温 ≤25℃ 7月平均相对湿度 ≥50%	1. 建筑物必须满足冬季保温、防寒、防冻等要求 2. ⅠA、ⅠB区应防止冻土、积雪对建筑物的危害 3. ⅠB、ⅠC、ⅠD区的西部，建筑物应防冰雹、防风沙

续表 3.3.1

分区名称		热工分区名称	气候主要指标	建筑基本要求
Ⅱ	ⅡA ⅡB	寒冷地区	1月平均气温 −10～0℃ 7月平均气温 18～28℃	1. 建筑物应满足冬季保温、防寒、防冻等要求，夏季部分地区应兼顾防热 2. ⅡA区建筑物应防热、防潮、防暴风雨，沿海地带应防盐雾侵蚀
Ⅲ	ⅢA ⅢB ⅢC	夏热冬冷地区	1月平均气温 0～10℃ 7月平均气温 25～30℃	1. 建筑物必须满足夏季防热，遮阳、通风降温要求，冬季应兼顾防寒 2. 建筑物应防雨、防潮、防洪、防雷电 3. ⅢA区应防台风、暴雨袭击及盐雾侵蚀
Ⅳ	ⅣA ⅣB	夏热冬暖地区	1月平均气温 ＞10℃ 7月平均气温 25～29℃	1. 建筑物必须满足夏季防热，遮阳、通风、防雨要求 2. 建筑物应防暴雨、防潮、防洪、防雷电 3. ⅣA区应防台风、暴雨袭击及盐雾侵蚀
Ⅴ	ⅤA ⅤB	温和地区	7月平均气温 18～25℃ 1月平均气温 0～13℃	1. 建筑物应满足防雨和通风要求 2. ⅤA区建筑物应注意防寒，ⅤB区应特别注意防雷电
Ⅵ	ⅥA ⅥB	严寒地区	7月平均气温 ＜18℃ 1月平均气温 0～−22℃	1. 热工应符合严寒和寒冷地区相关要求 2. ⅥA、ⅥB应防冻土对建筑物地基及地下管道的影响，并应特别注意防风沙 3. ⅥC区的东部，建筑物应防雷电
	ⅥC	寒冷地区		
Ⅶ	ⅦA ⅦB ⅦC	严寒地区	7月平均气温 ≥18℃ 1月平均气温 −5～−20℃ 7月平均相对湿度 ＜50%	1. 热工应符合严寒和寒冷地区相关要求 2. 除ⅦD区外，应防冻土对建筑物地基及地下管道的危害 3. ⅦB区建筑物应特别注意积雪的危害 4. ⅦC区建筑物应特别注意防风沙，夏季兼顾防热 5. ⅦD区建筑物应注意夏季防热，吐鲁番盆地应特别注意隔热、降温
	ⅦD	寒冷地区		

3.4 建筑与环境的关系

3.4.1 建筑与环境的关系应符合下列要求：

1 建筑基地应选择在无地质灾害或洪水淹没等危险的安全地段；

2 建筑总体布局应结合当地的自然与地理环境特征，不应破坏自然生态环境；

3 建筑物周围应具有能获得日照、天然采光、自然通风等的卫生条件；

4 建筑物周围环境的空气、土壤、水体等不应构成对人体的危害，确保卫生安全的

环境；

5　对建筑物使用过程中产生的垃圾、废气、废水等废弃物应进行处理，并应对噪声、眩光等进行有效的控制，不应引起公害；

6　建筑整体造型与色彩处理应与周围环境协调；

7　建筑基地应做绿化、美化环境设计，完善室外环境设施。

3.5　建筑无障碍设施

3.5.1　居住区道路、公共绿地和公共服务设施应设置无障碍设施，并与城市道路无障碍设施相连接。

3.5.2　设置电梯的民用建筑的公共交通部位应设无障碍设施。

3.5.3　残疾人、老年人专用的建筑物应设置无障碍设施。

3.5.4　居住区及民用建筑无障碍设施的实施范围和设计要求应符合国家现行标准《城市道路和建筑物无障碍设计规范》JGJ 50 的规定。

3.6　停 车 空 间

3.6.1　新建、扩建的居住区应就近设置停车场(库)或将停车库附建在住宅建筑内。机动车和非机动车停车位数量应符合有关规范或当地城市规划行政主管部门的规定。

3.6.2　新建、扩建的公共建筑应按建筑面积或使用人数，并根据当地城市规划行政主管部门的规定，在建筑物内或在同一基地内，或统筹建设的停车场(库)内设置机动车和非机动车停车车位。

3.6.3　机动车停车场(库)产生的噪声和废气应进行处理，不得影响周围环境，其设计应符合有关规范的规定。

3.7　无标定人数的建筑

3.7.1　建筑物除有固定座位等标明使用人数外，对无标定人数的建筑物应按有关设计规范或经调查分析确定合理的使用人数，并以此为基数计算安全出口的宽度。

3.7.2　公共建筑中如为多功能用途，各种场所有可能同时开放并使用同一出口时，在水平方向应按各部分使用人数叠加计算安全疏散出口的宽度，在垂直方向应按楼层使用人数最多一层计算安全疏散出口的宽度。

4 城市规划对建筑的限定

4.1 建筑基地

4.1.1 基地内建筑使用性质应符合城市规划确定的用地性质。

4.1.2 基地应与道路红线相邻接，否则应设基地道路与道路红线所划定的城市道路相连接。基地内建筑面积小于或等于 3000m² 时，基地道路的宽度不应小于 4m，基地内建筑面积大于 3000m² 且只有一条基地道路与城市道路相连接时，基地道路的宽度不应小于 7m，若有两条以上基地道路与城市道路相连接时，基地道路的宽度不应小于 4m。

4.1.3 基地地面高程应符合下列规定：

1 基地地面高程应按城市规划确定的控制标高设计；

2 基地地面高程应与相邻基地标高协调，不妨碍相邻各方的排水；

3 基地地面最低处高程宜高于相邻城市道路最低高程，否则应有排除地面水的措施。

4.1.4 相邻基地的关系应符合下列规定：

1 建筑物与相邻基地之间应按建筑防火等要求留出空地和道路。当建筑前后各自留有空地或道路，并符合防火规范有关规定时，则相邻基地边界两边的建筑可毗连建造；

2 本基地内建筑物和构筑物均不得影响本基地或其他用地内建筑物的日照标准和采光标准；

3 除城市规划确定的永久性空地外，紧贴基地用地红线建造的建筑物不得向相邻基地方向设洞口、门、外平开窗、阳台、挑檐、空调室外机、废气排出口及排泄雨水。

4.1.5 基地机动车出入口位置应符合下列规定：

1 与大中城市主干道交叉口的距离，自道路红线交叉点量起不应小于 70m；

2 与人行横道线、人行过街天桥、人行地道（包括引道、引桥）的最边缘线不应小于 5m；

3 距地铁出入口、公共交通站台边缘不应小于 15m；

4 距公园、学校、儿童及残疾人使用建筑的出入口不应小于 20m；

5 当基地道路坡度大于 8%时，应设缓冲段与城市道路连接；

6 与立体交叉口的距离或其他特殊情况，应符合当地城市规划行政主管部门的规定。

4.1.6 大型、特大型的文化娱乐、商业服务、体育、交通等人员密集建筑的基地应符合下列规定：

1 基地应至少有一面直接临接城市道路，该城市道路应有足够的宽度，以减少人员疏散时对城市正常交通的影响；

2　基地沿城市道路的长度应按建筑规模或疏散人数确定，并至少不小于基地周长的1/6；

3　基地应至少有两个或两个以上不同方向通向城市道路的（包括以基地道路连接的）出口；

4　基地或建筑物的主要出入口，不得和快速道路直接连接，也不得直对城市主要干道的交叉口；

5　建筑物主要出入口前应有供人员集散用的空地，其面积和长宽尺寸应根据使用性质和人数确定；

6　绿化和停车场布置不应影响集散空地的使用，并不宜设置围墙、大门等障碍物。

4.2　建筑突出物

4.2.1　建筑物及附属设施不得突出道路红线和用地红线建造，不得突出的建筑突出物为：

——地下建筑物及附属设施，包括结构挡土桩、挡土墙、地下室、地下室底板及其基础、化粪池等；

——地上建筑物及附属设施，包括门廊、连廊、阳台、室外楼梯、台阶、坡道、花池、围墙、平台、散水明沟、地下室进排风口、地下室出入口、集水井、采光井等；

——除基地内连接城市的管线、隧道、天桥等市政公共设施外的其他设施。

4.2.2　经当地城市规划行政主管部门批准，允许突出道路红线的建筑突出物应符合下列规定：

1　在有人行道的路面上空：

1）2.50m以上允许突出建筑构件：凸窗、窗扇、窗罩、空调机位，突出的深度不应大于0.50m；

2）2.50m以上允许突出活动遮阳，突出宽度不应大于人行道宽度减1m，并不应大于3m；

3）3m以上允许突出雨篷、挑檐，突出的深度不应大于2m；

4）5m以上允许突出雨篷、挑檐，突出的深度不宜大于3m。

2　在无人行道的路面上空：4m以上允许突出建筑构件：窗罩，空调机位，突出深度不应大于0.50m。

3　建筑突出物与建筑本身应有牢固的结合。

4　建筑物和建筑突出物均不得向道路上空直接排泄雨水、空调冷凝水及从其他设施排出的废水。

4.2.3　当地城市规划行政主管部门在用地红线范围内另行划定建筑控制线时，建筑物的基底不应超出建筑控制线，突出建筑控制线的建筑突出物和附属设施应符合当地城市规划的要求。

4.2.4　属于公益上有需要而不影响交通及消防安全的建筑物、构筑物，包括公共电话亭、公共交通候车亭、治安岗等公共设施及临时性建筑物和构筑物，经当地城市规划行政

主管部门的批准，可突入道路红线建造。

4.2.5 骑楼、过街楼和沿道路红线的悬挑建筑建造不应影响交通及消防的安全；在有顶盖的公共空间下不应设置直接排气的空调机、排气扇等设施或排出有害气体的通风系统。

4.3 建筑高度控制

4.3.1 建筑高度不应危害公共空间安全、卫生和景观，下列地区应实行建筑高度控制：

1 对建筑高度有特别要求的地区，应按城市规划要求控制建筑高度；

2 沿城市道路的建筑物，应根据道路的宽度控制建筑裙楼和主体塔楼的高度；

3 机场、电台、电信、微波通信、气象台、卫星地面站、军事要塞工程等周围的建筑，当其处在各种技术作业控制区范围内时，应按净空要求控制建筑高度；

4 当建筑处在本通则第1章第1.0.3条第8款所指的保护规划区内。

注：建筑高度控制尚应符合当地城市规划行政主管部门和有关专业部门的规定。

4.3.2 建筑高度控制的计算应符合下列规定：

1 第4.3.1条3、4款控制区内建筑高度，应按建筑物室外地面至建筑物和构筑物最高点的高度计算；

2 非第4.3.1条3、4款控制区内建筑高度：平屋顶应按建筑物室外地面至其屋面面层或女儿墙顶点的高度计算；坡屋顶应按建筑物室外地面至屋檐和屋脊的平均高度计算；下列突出物不计入建筑高度内：

1) 局部突出屋面的楼梯间、电梯机房、水箱间等辅助用房占屋顶平面面积不超过1/4者；

2) 突出屋面的通风道、烟囱、装饰构件、花架、通信设施等；

3) 空调冷却塔等设备。

4.4 建筑密度、容积率和绿地率

4.4.1 建筑设计应符合法定规划控制的建筑密度、容积率和绿地率的要求。

4.4.2 当建设单位在建筑设计中为城市提供永久性的建筑开放空间，无条件地为公众使用时，该用地的既定建筑密度和容积率可给予适当提高，且应符合当地城市规划行政主管部门有关规定。

5 场地设计

5.1 建筑布局

5.1.1 民用建筑应根据城市规划条件和任务要求，按照建筑与环境关系的原则，对建筑布局、道路、竖向、绿化及工程管线等进行综合性的场地设计。

5.1.2 建筑布局应符合下列规定

1 建筑间距应符合防火规范要求；

2 建筑间距应满足建筑用房天然采光(本通则第7章7.1节采光)的要求，并应防止视线干扰；

3 有日照要求的建筑应符合本节第5.1.3条建筑日照标准的要求，并应执行当地城市规划行政主管部门制定的相应的建筑间距规定；

4 对有地震等自然灾害地区，建筑布局应符合有关安全标准的规定；

5 建筑布局应使建筑基地内的人流、车流与物流合理分流，防止干扰，并有利于消防、停车和人员集散；

6 建筑布局应根据地域气候特征，防止和抵御寒冷、暑热、疾风、暴雨、积雪和沙尘等灾害侵袭，并应利用自然气流组织好通风，防止不良小气候产生；

7 根据噪声源的位置、方向和强度，应在建筑功能分区、道路布置、建筑朝向、距离以及地形、绿化和建筑物的屏障作用等方面采取综合措施，以防止或减少环境噪声；

8 建筑物与各种污染源的卫生距离，应符合有关卫生标准的规定。

5.1.3 建筑日照标准应符合下列要求：

1 每套住宅至少应有一个居住空间获得日照，该日照标准应符合现行国家标准《城市居住区规划设计规范》GB 50180有关规定；

2 宿舍半数以上的居室，应能获得同住宅居住空间相等的日照标准；

3 托儿所、幼儿园的主要生活用房，应能获得冬至日不小于3h的日照标准；

4 老年人住宅、残疾人住宅的卧室、起居室，医院、疗养院半数以上的病房和疗养室，中小学半数以上的教室应能获得冬至日不小于2h的日照标准。

5.2 道　路

5.2.1 建筑基地内道路应符合下列规定：

1 基地内应设道路与城市道路相连接，其连接处的车行路面应设限速设施，道路应能通达建筑物的安全出口；

2 沿街建筑应设连通街道和内院的人行通道(可利用楼梯间)，其间距不宜大于80m；

3 道路改变方向时，路边绿化及建筑物不应影响行车有效视距；

4　基地内设地下停车场时，车辆出入口应设有效显示标志；标志设置高度不应影响人、车通行；

5　基地内车流量较大时应设人行道路。

5.2.2　建筑基地道路宽度应符合下列规定：

1　单车道路宽度不应小于4m，双车道路不应小于7m；

2　人行道路宽度不应小于1.50m；

3　利用道路边设停车位时，不应影响有效通行宽度；

4　车行道路改变方向时，应满足车辆最小转弯半径要求；消防车道路应按消防车最小转弯半径要求设置。

5.2.3　道路与建筑物间距应符合下列规定：

1　基地内设有室外消火栓时，车行道路与建筑物的间距应符合防火规范的有关规定；

2　基地内道路边缘至建筑物、构筑物的最小距离应符合现行国家标准《城市居住区规划设计规范》GB 50180的有关规定；

3　基地内不宜设高架车行道路，当设置高架人行道路与建筑平行时应有保护私密性的视距和防噪声的要求。

5.2.4　建筑基地内地下车库的出入口设置应符合下列要求：

1　地下车库出入口距基地道路的交叉路口或高架路的起坡点不应小于7.50m；

2　地下车库出入口与道路垂直时，出入口与道路红线应保持不小于7.50m安全距离；

3　地下车库出入口与道路平行时，应经不小于7.50m长的缓冲车道汇入基地道路。

5.3　竖　　向

5.3.1　建筑基地地面和道路坡度应符合下列规定：

1　基地地面坡度不应小于0.2%，地面坡度大于8%时宜分成台地，台地连接处应设挡墙或护坡；

2　基地机动车道的纵坡不应小于0.2%，亦不应大于8%，其坡长不应大于200m，在个别路段可不大于11%，其坡长不应大于80m；在多雪严寒地区不应大于5%，其坡长不应大于600m；横坡应为1%～2%；

3　基地非机动车道的纵坡不应小于0.2%，亦不应大于3%，其坡长不应大于50m；在多雪严寒地区不应大于2%，其坡长不应大于100m；横坡应为1%～2%；

4　基地步行道的纵坡不应小于0.2%，亦不应大于8%，多雪严寒地区不应大于4%，横坡应为1%～2%；

5　基地内人流活动的主要地段，应设置无障碍人行道。

注：山地和丘陵地区竖向设计尚应符合有关规范的规定。

5.3.2　建筑基地地面排水应符合下列规定：

1　基地内应有排除地面及路面雨水至城市排水系统的措施，排水方式应根据城市

规划的要求确定，有条件的地区应采取雨水回收利用措施；

2 采用车行道排泄地面雨水时，雨水口形式及数量应根据汇水面积、流量、道路纵坡等确定；

3 单侧排水的道路及低洼易积水的地段，应采取排雨水时不影响交通和路面清洁的措施。

5.3.3 建筑物底层出入口处应采取措施防止室外地面雨水回流。

5.4 绿 化

5.4.1 建筑工程项目应包括绿化工程，其设计应符合下列要求：

1 宜采用包括垂直绿化和屋顶绿化等在内的全方位绿化；绿地面积的指标应符合有关规范或当地城市规划行政主管部门的规定；

2 绿化的配置和布置方式应根据城市气候、土壤和环境功能等条件确定；

3 绿化与建筑物、构筑物、道路和管线之间的距离，应符合有关规范规定；

4 应保护自然生态环境，并应对古树名木采取保护措施；

5 应防止树木根系对地下管线缠绕及对地下建筑防水层的破坏。

5.5 工程管线布置

5.5.1 工程管线宜在地下敷设；在地上架空敷设的工程管线及工程管线在地上设置的设施，必须满足消防车辆通行的要求，不得妨碍普通车辆、行人的正常活动，并应防止对建筑物、景观的不利影响。

5.5.2 与市政管网衔接的工程管线，其平面位置和竖向标高均应采用城市统一的坐标系统和高程系统。

5.5.3 工程管线的敷设不应影响建筑物的安全，并应防止工程管线受腐蚀、沉陷、振动、荷载等影响而损坏。

5.5.4 工程管线应根据其不同特性和要求综合布置。对安全、卫生、防干扰等有影响的工程管线不应共沟或靠近敷设。利用综合管沟敷设的工程管线若互有干扰的应设置在综合管沟的不同沟(室)内。

5.5.5 地下工程管线的走向宜与道路或建筑主体相平行或垂直。工程管线应从建筑物向道路方向由浅至深敷设。工程管线布置应短捷，减少转弯。管线与管线、管线与道路应减少交叉。

5.5.6 与道路平行的工程管线不宜设于车行道下，当确有需要时，可将埋深较大、翻修较少的工程管线布置在车行道下。

5.5.7 工程管线之间的水平、垂直净距及埋深，工程管线与建筑物、构筑物、绿化树种之间的水平净距应符合有关规范的规定。

5.5.8 七度以上地震区、多年冻土区、严寒地区、湿陷性黄土地区及膨胀土地区的室外工程管线，应符合有关规范的规定。

5.5.9 工程管线的检查井井盖宜有锁闭装置。

6 建筑物设计

6.1 平面布置

6.1.1 平面布置应根据建筑的使用性质、功能、工艺要求，合理布局。

6.1.2 平面布置的柱网、开间、进深等定位轴线尺寸，应符合现行国家标准《建筑模数协调统一标准》GBJ 2 等有关标准的规定。

6.1.3 根据使用功能，应使大多数房间或重要房间布置在有良好日照、采光、通风和景观的部位。对有私密性要求的房间，应防止视线干扰。

6.1.4 平面布置宜具有一定的灵活性。

6.1.5 地震区的建筑，平面布置宜规整，不宜错层。

6.2 层高和室内净高

6.2.1 建筑层高应结合建筑使用功能、工艺要求和技术经济条件综合确定，并符合专用建筑设计规范的要求。

6.2.2 室内净高应按楼地面完成面至吊顶或楼板或梁底面之间的垂直距离计算；当楼盖、屋盖的下悬构件或管道底面影响有效使用空间者，应按楼地面完成面至下悬构件下缘或管道底面之间的垂直距离计算。

6.2.3 建筑物用房的室内净高应符合专用建筑设计规范的规定；地下室、局部夹层、走道等有人员正常活动的最低处的净高不应小于 2m。

6.3 地下室和半地下室

6.3.1 地下室、半地下室应有综合解决其使用功能的措施，合理布置地下停车库、地下人防、各类设备用房等功能空间及各类出入口部；地下空间与城市地铁、地下人行道及地下空间之间应综合开发，相互连接，做到导向明确、流线简捷。

6.3.2 地下室、半地下室作为主要用房使用时，应符合安全、卫生的要求，并应符合下列要求：

1 严禁将幼儿、老年人生活用房设在地下室或半地下室；

2 居住建筑中的居室不应布置在地下室内；当布置在半地下室时，必须对采光、通风、日照、防潮、排水及安全防护采取措施；

3 建筑物内的歌舞、娱乐、放映、游艺场所不应设置在地下二层及二层以下；当设置在地下一层时，地下一层地面与室外出入口地坪的高差不应大于 10m。

6.3.3 地下室平面外围护结构应规整，其防水等级及技术要求除应符合现行国家标准《地下工程防水技术规范》GB 50108 的规定外，尚应符合下列规定：

1 地下室应在一处或若干处地面较低点设集水坑，并预留排水泵电源和排水管

道；

2 地下管道、地下管沟、地下坑井、地漏、窗井等处应有防止涌水、倒灌的措施。

6.3.4 地下室、半地下室的耐火等级、防火分区、安全疏散、防排烟设施、房间内部装修等应符合防火规范的有关规定。

6.4 设备层、避难层和架空层

6.4.1 设备层设置应符合下列规定：

1 设备层的净高应根据设备和管线的安装检修需要确定；

2 当宾馆、住宅等建筑上部有管线较多的房间，下部为大空间房间或转换为其他功能用房而管线需转换时，宜在上下部之间设置设备层；

3 设备层布置应便于市政管线的接入；在防火、防爆和卫生等方面互有影响的设备用房不应相邻布置；

4 设备层应有自然通风或机械通风；当设备层设于地下室又无机械通风装置时，应在地下室外墙设置通风口或通风道，其面积应满足送、排风量的要求；

5 给排水设备的机房应设集水坑并预留排水泵电源和排水管路或接口；配电房应满足线路的敷设；

6 设备用房布置位置及其围护结构，管道穿过隔墙、防火墙和楼板等应符合防火规范的有关规定。

6.4.2 建筑高度超过 100m 的超高层民用建筑，应设置避难层(间)。

6.4.3 有人员正常活动的架空层及避难层的净高不应低于 2m。

6.5 厕所、盥洗室和浴室

6.5.1 厕所、盥洗室、浴室应符合下列规定：

1 建筑物的厕所、盥洗室、浴室不应直接布置在餐厅、食品加工、食品贮存、医药、医疗、变配电等有严格卫生要求或防水、防潮要求用房的上层；除本套住宅外，住宅卫生间不应直接布置在下层的卧室、起居室、厨房和餐厅的上层；

2 卫生设备配置的数量应符合专用建筑设计规范的规定，在公用厕所男女厕位的比例中，应适当加大女厕位比例；

3 卫生用房宜有天然采光和不向邻室对流的自然通风，无直接自然通风和严寒及寒冷地区用房宜设自然通风道；当自然通风不能满足通风换气要求时，应采用机械通风；

4 楼地面、楼地面沟槽、管道穿楼板及楼板接墙面处应严密防水、防渗漏；

5 楼地面、墙面或墙裙的面层应采用不吸水、不吸污、耐腐蚀、易清洗的材料；

6 楼地面应防滑，楼地面标高宜略低于走道标高，并应有坡度坡向地漏或水沟；

7 室内上下水管和浴室顶棚应防冷凝水下滴，浴室热水管应防止烫人；

8 公用男女厕所宜分设前室，或有遮挡措施；

9 公用厕所宜设置独立的清洁间。

6.5.2 厕所和浴室隔间的平面尺寸不应小于表 6.5.2 的规定。

表 6.5.2 厕所和浴室隔间平面尺寸

类　别	平面尺寸(宽度 m×深度 m)
外开门的厕所隔间	0.90×1.20
内开门的厕所隔间	0.90×1.40
医院患者专用厕所隔间	1.10×1.40
无障碍厕所隔间	1.40×1.80(改建用 1.00×2.00)
外开门淋浴隔间	1.00×1.20
内设更衣凳的淋浴隔间	1.00×(1.00+0.60)
无障碍专用浴室隔间	盆浴(门扇向外开启) 2.00×2.25 淋浴(门扇向外开启) 1.50×2.35

6.5.3 卫生设备间距应符合下列规定：

1 洗脸盆或盥洗槽水嘴中心与侧墙面净距不宜小于 0.55m；

2 并列洗脸盆或盥洗槽水嘴中心间距不应小于 0.70m；

3 单侧并列洗脸盆或盥洗槽外沿至对面墙的净距不应小于 1.25m；

4 双侧并列洗脸盆或盥洗槽外沿之间的净距不应小于 1.80m；

5 浴盆长边至对面墙面的净距不应小于 0.65m；无障碍盆浴间短边净宽度不应小于 2m；

6 并列小便器的中心距离不应小于 0.65m；

7 单侧厕所隔间至对面墙面的净距：当采用内开门时，不应小于 1.10m；当采用外开门时不应小于 1.30m；双侧厕所隔间之间的净距：当采用内开门时，不应小于 1.10m；当采用外开门时不应小于 1.30m；

8 单侧厕所隔间至对面小便器或小便槽外沿的净距：当采用内开门时，不应小于 1.10m；当采用外开门时，不应小于 1.30m。

6.6 台阶、坡道和栏杆

6.6.1 台阶设置应符合下列规定：

1 公共建筑室内外台阶踏步宽度不宜小于 0.30m，踏步高度不宜大于 0.15m，并不宜小于 0.10m，踏步应防滑。室内台阶踏步数不应少于 2 级，当高差不足 2 级时，应按坡道设置；

2 人流密集的场所台阶高度超过 0.70m 并侧面临空时，应有防护设施。

6.6.2 坡道设置应符合下列规定：

1 室内坡道坡度不宜大于 1∶8，室外坡道坡度不宜大于1∶10；

2 室内坡道水平投影长度超过 15m 时，宜设休息平台，平台宽度应根据使用功能或设备尺寸所需缓冲空间而定；

3　供轮椅使用的坡道不应大于1∶12，困难地段不应大于1∶8；

4　自行车推行坡道每段坡长不宜超过6m，坡度不宜大于1∶5；

5　机动车行坡道应符合国家现行标准《汽车库建筑设计规范》JGJ 100的规定；

6　坡道应采取防滑措施。

6.6.3　阳台、外廊、室内回廊、内天井、上人屋面及室外楼梯等临空处应设置防护栏杆，并应符合下列规定：

1　栏杆应以坚固、耐久的材料制作，并能承受荷载规范规定的水平荷载；

2　临空高度在24m以下时，栏杆高度不应低于1.05m，临空高度在24m及24m以上（包括中高层住宅）时，栏杆高度不应低于1.10m；

注：栏杆高度应从楼地面或屋面至栏杆扶手顶面垂直高度计算，如底部有宽度大于或等于0.22m，且高度低于或等于0.45m的可踏部位，应从可踏部位顶面起计算。

3　栏杆离楼面或屋面0.10m高度内不宜留空；

4　住宅、托儿所、幼儿园、中小学及少年儿童专用活动场所的栏杆必须采用防止少年儿童攀登的构造，当采用垂直杆件做栏杆时，其杆件净距不应大于0.11m；

5　文化娱乐建筑、商业服务建筑、体育建筑、园林景观建筑等允许少年儿童进入活动的场所，当采用垂直杆件做栏杆时，其杆件净距也不应大于0.11m。

6.7　楼　　梯

6.7.1　楼梯的数量、位置、宽度和楼梯间形式应满足使用方便和安全疏散的要求。

6.7.2　墙面至扶手中心线或扶手中心线之间的水平距离即楼梯梯段宽度除应符合防火规范的规定外，供日常主要交通用的楼梯的梯段宽度应根据建筑物使用特征，按每股人流为0.55+(0～0.15)m的人流股数确定，并不应少于两股人流。0～0.15m为人流在行进中人体的摆幅，公共建筑人流众多的场所应取上限值。

6.7.3　梯段改变方向时，扶手转向端处的平台最小宽度不应小于梯段宽度，并不得小于1.20m，当有搬运大型物件需要时应适量加宽。

6.7.4　每个梯段的踏步不应超过18级，亦不应少于3级。

6.7.5　楼梯平台上部及下部过道处的净高不应小于2m，梯段净高不宜小于2.20m。

注：梯段净高为自踏步前缘（包括最低和最高一级踏步前缘线以外0.30m范围内）量至上方突出物下缘间的垂直高度。

6.7.6　楼梯应至少于一侧设扶手，梯段净宽达三股人流时应两侧设扶手，达四股人流时宜加设中间扶手。

6.7.7　室内楼梯扶手高度自踏步前缘线量起不宜小于0.90m。靠楼梯井一侧水平扶手长度超过0.50m时，其高度不应小于1.05m。

6.7.8　踏步应采取防滑措施。

6.7.9　托儿所、幼儿园、中小学及少年儿童专用活动场所的楼梯，梯井净宽大于0.20m时，必须采取防止少年儿童攀滑的措施，楼梯栏杆应采取不易攀登的构造，当采用垂直杆件做栏杆时，其杆件净距不应大于0.11m。

6.7.10　楼梯踏步的高宽比应符合表6.7.10的规定。

表 6.7.10 楼梯踏步最小宽度和最大高度(m)

楼梯类别	最小宽度	最大高度
住宅共用楼梯	0.26	0.175
幼儿园、小学校等楼梯	0.26	0.15
电影院、剧场、体育馆、商场、医院、旅馆和大中学校等楼梯	0.28	0.16
其他建筑楼梯	0.26	0.17
专用疏散楼梯	0.25	0.18
服务楼梯、住宅套内楼梯	0.22	0.20

注:无中柱螺旋楼梯和弧形楼梯离内侧扶手中心 0.25 m 处的踏步宽度不应小于 0.22m。

6.7.11 供老年人、残疾人使用及其他专用服务楼梯应符合专用建筑设计规范的规定。

6.8 电梯、自动扶梯和自动人行道

6.8.1 电梯设置应符合下列规定:

1 电梯不得计作安全出口;

2 以电梯为主要垂直交通的高层公共建筑和 12 层及 12 层以上的高层住宅,每栋楼设置电梯的台数不应少于 2 台;

3 建筑物每个服务区单侧排列的电梯不宜超过 4 台,双侧排列的电梯不宜超过 2×4 台;电梯不应在转角处贴邻布置;

4 电梯候梯厅的深度应符合表 6.8.1 的规定,并不得小于 1.50m;

表 6.8.1 候梯厅深度

电梯类别	布置方式	候梯厅深度
住宅电梯	单台	$\geqslant B$
	多台单侧排列	$\geqslant B^*$
	多台双侧排列	≥相对电梯 B^* 之和并<3.50m
公共建筑电梯	单台	$\geqslant 1.5B$
	多台单侧排列	$\geqslant 1.5B^*$,当电梯群为 4 台时应≥2.40m
	多台双侧排列	≥相对电梯 B^* 之和并<4.50m
病床电梯	单台	$\geqslant 1.5B$
	多台单侧排列	$\geqslant 1.5B^*$
	多台双侧排列	≥相对电梯 B^* 之和

注:B 为轿厢深度,B^* 为电梯群中最大轿厢深度。

5 电梯井道和机房不宜与有安静要求的用房贴邻布置,否则应采取隔振、隔声措施;

6　机房应为专用的房间，其围护结构应保温隔热，室内应有良好通风、防尘，宜有自然采光，不得将机房顶板作水箱底板及在机房内直接穿越水管或蒸汽管；

7　消防电梯的布置应符合防火规范的有关规定。

6.8.2　自动扶梯、自动人行道应符合下列规定：

1　自动扶梯和自动人行道不得计作安全出口；

2　出入口畅通区的宽度不应小于 2.50m，畅通区有密集人流穿行时，其宽度应加大；

3　栏板应平整、光滑和无突出物；扶手带顶面距自动扶梯前缘、自动人行道踏板面或胶带面的垂直高度不应小于 0.90m；扶手带外边至任何障碍物不应小于 0.50m，否则应采取措施防止障碍物引起人员伤害；

4　扶手带中心线与平行墙面或楼板开口边缘间的距离、相邻平行交叉设置时两梯（道）之间扶手带中心线的水平距离不宜小于 0.50m，否则应采取措施防止障碍物引起人员伤害；

5　自动扶梯的梯级、自动人行道的踏板或胶带上空，垂直净高不应小于 2.30m；

6　自动扶梯的倾斜角不应超过 30°，当提升高度不超过 6m，额定速度不超过 0.50m/s 时，倾斜角允许增至 35°；倾斜式自动人行道的倾斜角不应超过 12°；

7　自动扶梯和层间相通的自动人行道单向设置时，应就近布置相匹配的楼梯；

8　设置自动扶梯或自动人行道所形成的上下层贯通空间，应符合防火规范所规定的有关防火分区等要求。

6.9　墙身和变形缝

6.9.1　墙身材料应因地制宜，采用新型建筑墙体材料。

6.9.2　外墙应根据地区气候和建筑要求，采取保温、隔热和防潮等措施。

6.9.3　墙身防潮应符合下列要求：

1　砌体墙应在室外地面以上，位于室内地面垫层处设置连续的水平防潮层；室内相邻地面有高差时，应在高差处墙身侧面加设防潮层；

2　湿度大的房间的外墙或内墙内侧应设防潮层；

3　室内墙面有防水、防潮、防污、防碰等要求时，应按使用要求设置墙裙。

注：地震区防潮层应满足墙体抗震整体连接的要求。

6.9.4　建筑物外墙突出物，包括窗台、凸窗、阳台、空调机搁板、雨水管、通风管、装饰线等处宜采取防止攀登入室的措施。

6.9.5　外墙应防止变形裂缝，在洞口、窗户等处采取加固措施。

6.9.6　变形缝设置应符合下列要求：

1　变形缝应按设缝的性质和条件设计，使其在产生位移或变形时不受阻，不被破坏，并不破坏建筑物；

2　变形缝的构造和材料应根据其部位需要分别采取防排水、防火、保温、防老化、防腐蚀、防虫害和防脱落等措施。

6.10 门　窗

6.10.1 门窗产品应符合下列要求：

1 门窗的材料、尺寸、功能和质量等应符合使用要求，并应符合建筑门窗产品标准的规定；

2 门窗的配件应与门窗主体相匹配，并应符合各种材料的技术要求；

3 应推广应用具有节能、密封、隔声、防结露等优良性能的建筑门窗。

注：门窗加工的尺寸，应按门窗洞口设计尺寸扣除墙面装修材料的厚度，按净尺寸加工。

6.10.2 门窗与墙体应连接牢固，且满足抗风压、水密性、气密性的要求，对不同材料的门窗选择相应的密封材料。

6.10.3 窗的设置应符合下列规定：

1 窗扇的开启形式应方便使用，安全和易于维修、清洗；

2 当采用外开窗时应加强牢固窗扇的措施；

3 开向公共走道的窗扇，其底面高度不应低于2m；

4 临空的窗台低于0.80m时，应采取防护措施，防护高度由楼地面起计算不应低于0.80m；

5 防火墙上必须开设窗洞时，应按防火规范设置；

6 天窗应采用防破碎伤人的透光材料；

7 天窗应有防冷凝水产生或引泄冷凝水的措施；

8 天窗应便于开启、关闭、固定、防渗水，并方便清洗。

注：1 住宅窗台低于0.90m时，应采取防护措施；

2 低窗台、凸窗等下部有能上人站立的宽窗台面时，贴窗护栏或固定窗的防护高度应从窗台面起计算。

6.10.4 门的设置应符合下列规定：

1 外门构造应开启方便，坚固耐用；

2 手动开启的大门扇应有制动装置，推拉门应有防脱轨的措施；

3 双面弹簧门应在可视高度部分装透明安全玻璃；

4 旋转门、电动门、卷帘门和大型门的邻近应另设平开疏散门，或在门上设疏散门；

5 开向疏散走道及楼梯间的门扇开足时，不应影响走道及楼梯平台的疏散宽度；

6 全玻璃门应选用安全玻璃或采取防护措施，并应设防撞提示标志；

7 门的开启不应跨越变形缝。

6.11 建筑幕墙

6.11.1 建筑幕墙技术要求应符合下列规定：

1 幕墙所采用的型材、板材、密封材料、金属附件、零配件等均应符合现行的有关标准的规定；

2 幕墙的物理性能：风压变形、雨水渗漏、空气渗透、保温、隔声、耐撞击、平面内变

形、防火、防雷、抗震及光学性能等应符合现行的有关标准的规定。

6.11.2 玻璃幕墙应符合下列规定：

1 玻璃幕墙适用于抗震地区和建筑高度应符合有关规范的要求；

2 玻璃幕墙应采用安全玻璃，并应具有抗撞击的性能；

3 玻璃幕墙分隔应与楼板、梁、内隔墙处连接牢固，并满足防火分隔要求；

4 玻璃窗扇开启面积应按幕墙材料规格和通风口要求确定，并确保安全。

6.12 楼 地 面

6.12.1 底层地面的基本构造层宜为面层、垫层和地基；楼层地面的基本构造层宜为面层和楼板。当底层地面或楼面的基本构造不能满足使用或构造要求时，可增设结合层、隔离层、填充层、找平层和保温层等其他构造层。

6.12.2 除有特殊使用要求外，楼地面应满足平整、耐磨、不起尘、防滑、防污染、隔声、易于清洁等要求。

6.12.3 厕浴间、厨房等受水或非腐蚀性液体经常浸湿的楼地面应采用防水、防滑类面层，且应低于相邻楼地面，并设排水坡坡向地漏；厕浴间和有防水要求的建筑地面必须设置防水隔离层；楼层结构必须采用现浇混凝土或整块预制混凝土板，混凝土强度等级不应小于C20；楼板四周除门洞外，应做混凝土翻边，其高度不应小于120mm。

经常有水流淌的楼地面应低于相邻楼地面或设门槛等挡水设施，且应有排水措施，其楼地面应采用不吸水、易冲洗、防滑的面层材料，并应设置防水隔离层。

6.12.4 筑于地基土上的地面，应根据需要采取防潮、防基土冻胀、防不均匀沉陷等措施。

6.12.5 存放食品、食料、种子或药物等的房间，其存放物与楼地面直接接触时，严禁采用有毒性的材料作为楼地面，材料的毒性应经有关卫生防疫部门鉴定。存放吸味较强的食物时，应防止采用散发异味的楼地面材料。

6.12.6 受较大荷载或有冲击力作用的楼地面，应根据使用性质及场所选用由板、块材料、混凝土等组成的易于修复的刚性构造，或由粒料、灰土等组成的柔性构造。

6.12.7 木板楼地面应根据使用要求，采取防火、防腐、防潮、防蛀、通风等相应措施。

6.12.8 采暖房间的楼地面，可不采取保温措施，但遇下列情况之一时应采取局部保温措施：

1 架空或悬挑部分楼层地面，直接对室外或临非采暖房间的；

2 严寒地区建筑物周边无采暖管沟时，底层地面在外墙内侧0.50～1.00m范围内宜采取保温措施，其传热阻不应小于外墙的传热阻。

6.13 屋 面 和 吊 顶

6.13.1 屋面工程应根据建筑物的性质、重要程度、使用功能及防水层合理使用年限，结合工程特点、地区自然条件等，按不同等级进行设防。

6.13.2 屋面排水坡度应根据屋顶结构形式，屋面基层类别，防水构造形式，材料性能

及当地气候等条件确定，并应符合表 6.13.2 的规定。

表 6.13.2　屋面的排水坡度

屋面类别	屋面排水坡度(%)
卷材防水、刚性防水的平屋面	2～5
平　瓦	20～50
波形瓦	10～50
油毡瓦	≥20
网架、悬索结构金属板	≥4
压型钢板	5～35
种植土屋面	1～3

注：1　平屋面采用结构找坡不应小于 3%，采用材料找坡宜为 2%；

2　卷材屋面的坡度不宜大于 25%，当坡度大于 25%时应采取固定和防止滑落的措施；

3　卷材防水屋面天沟、檐沟纵向坡度不应小于 1%，沟底水落差不得超过 200mm。天沟、檐沟排水不得流经变形缝和防火墙；

4　平瓦必须铺置牢固，地震设防地区或坡度大于 50%的屋面，应采取固定加强措施；

5　架空隔热屋面坡度不宜大于 5%，种植屋面坡度不宜大于 3%。

6.13.3　屋面构造应符合下列要求：

1　屋面面层应采用不燃烧体材料，包括屋面突出部分及屋顶加层，但一、二级耐火等级建筑物，其不燃烧体屋面基层上可采用可燃卷材防水层；

2　屋面排水宜优先采用外排水；高层建筑、多跨及集水面积较大的屋面宜采用内排水；屋面水落管的数量、管径应通过验(计)算确定；

3　天沟、檐沟、檐口、水落口、泛水、变形缝和伸出屋面管道等处应采取与工程特点相适应的防水加强构造措施，并应符合有关规范的规定；

4　当屋面坡度较大或同一屋面落差较大时，应采取固定加强和防止屋面滑落的措施；平瓦必须铺置牢固；

5　地震设防区或有强风地区的屋面应采取固定加强措施；

6　设保温层的屋面应通过热工验算，并采取防结露、防蒸汽渗透及施工时防保温层受潮等措施；

7　采用架空隔热层的屋面，架空隔热层的高度应按照屋面的宽度或坡度的大小变化确定，架空层不得堵塞；当屋面宽度大于 10m 时，应设置通风屋脊；屋面基层上宜有适当厚度的保温隔热层；

8　采用钢丝网水泥或钢筋混凝土薄壁构件的屋面板应有抗风化、抗腐蚀的防护措施；刚性防水屋面应有抗裂措施；

9　当无楼梯通达屋面时，应设上屋面的检修人孔或低于 10m 时可设外墙爬梯，并应有安全防护和防止儿童攀爬的措施；

10　闷顶应设通风口和通向闷顶的检修人孔；闷顶内应有防火分隔。

6.13.4 吊顶构造应符合下列要求：

1 吊顶与主体结构吊挂应有安全构造措施；高大厅堂管线较多的吊顶内，应留有检修空间，并根据需要设置检修走道和便于进入吊顶的人孔，且应符合有关防火及安全要求；

2 当吊顶内管线较多，而空间有限不能进入检修时，可采用便于拆卸的装配式吊顶板或在需要部位设置检修手孔；

3 吊顶内敷设有上下水管时应采取防止产生冷凝水措施；

4 潮湿房间的吊顶，应采用防水材料和防结露、滴水的措施；钢筋混凝土顶板宜采用现浇板。

6.14 管道井、烟道、通风道和垃圾管道

6.14.1 管道井、烟道、通风道和垃圾管道应分别独立设置，不得使用同一管道系统，并应用非燃烧体材料制作。

6.14.2 管道井的设置应符合下列规定：

1 管道井的断面尺寸应满足管道安装、检修所需空间的要求；

2 管道井宜在每层靠公共走道的一侧设检修门或可拆卸的壁板；

3 在安全、防火和卫生方面互有影响的管道不应敷设在同一竖井内；

4 管道井壁、检修门及管井开洞部分等应符合防火规范的有关规定。

6.14.3 烟道和通风道的断面、形状、尺寸和内壁应有利于排烟(气)通畅，防止产生阻滞、涡流、窜烟、漏气和倒灌等现象。

6.14.4 烟道和通风道应伸出屋面，伸出高度应有利烟气扩散，并应根据屋面形式、排出口周围遮挡物的高度、距离和积雪深度确定。平屋面伸出高度不得小于0.60m，且不得低于女儿墙的高度。坡屋面伸出高度应符合下列规定：

1 烟道和通风道中心线距屋脊小于1.50m时，应高出屋脊0.60m；

2 烟道和通风道中心线距屋脊1.50～3.00m时，应高于屋脊，且伸出屋面高度不得小于0.60m；

3 烟道和通风道中心线距屋脊大于3m时，其顶部同屋脊的连线同水平线之间的夹角不应大于10°，且伸出屋面高度不得小于0.60m。

6.14.5 民用建筑不宜设置垃圾管道。多层建筑不设垃圾管道时，应根据垃圾收集方式设置相应设施。中高层及高层建筑不设置垃圾管道时，每层应设置封闭的垃圾分类、贮存收集空间，并宜有冲洗排污设施。

6.14.6 如设置垃圾管道时，应符合下列规定：

1 垃圾管道宜靠外墙布置，管道主体应伸出屋面，伸出屋面部分加设顶盖和网栅，并采取防倒灌措施；

2 垃圾出口应有卫生隔离，底部存纳和出运垃圾的方式应与城市垃圾管理方式相适应；

3 垃圾道内壁应光滑、无突出物；

4　垃圾斗应采用不燃烧和耐腐蚀的材料制作，并能自行关闭密合；高层建筑、超高层建筑的垃圾斗应设在垃圾道前室内，该前室应采用丙级防火门。

6.15　室内外装修

6.15.1　室内外装修应符合下列要求：

1　室内外装修严禁破坏建筑物结构的安全性；

2　室内外装修应采用节能、环保型建筑材料；

3　室内外装修工程应根据不同使用要求，采用防火、防污染、防潮、防水和控制有害气体和射线的装修材料和辅料；

4　保护性建筑的内外装修尚应符合有关保护建筑条例的规定。

6.15.2　室内装修应符合下列规定：

1　室内装修不得遮挡消防设施标志、疏散指示标志及安全出口，并不得影响消防设施和疏散通道的正常使用；

2　室内如需要重新装修时，不得随意改变原有设施、设备管线系统。

6.15.3　室外装修应符合下列规定：

1　外墙装修必须与主体结构连接牢靠；

2　外墙外保温材料应与主体结构和外墙饰面连接牢固，并应防开裂、防水、防冻、防腐蚀、防风化和防脱落；

3　外墙装修应防止污染环境的强烈反光。

7 室内环境

7.1 采　光

7.1.1 各类建筑应进行采光系数的计算，其采光系数标准值应符合下列规定。

1 居住建筑的采光系数标准值应符合表 7.1.1-1 的规定。

表 7.1.1-1 居住建筑的采光系数标准值

采光等级	房间名称	侧面采光	
		采光系数最低值 C_{min}(%)	室内天然光临界照度 (lx)
Ⅳ	起居室(厅)、卧室、书房、厨房	1	50
Ⅴ	卫生间、过厅、楼梯间、餐厅	0.5	25

2 办公建筑的采光系数标准值应符合表 7.1.1-2 的规定。

表 7.1.1-2 办公建筑的采光系数标准值

采光等级	房间名称	侧面采光	
		采光系数最低值 C_{min}(%)	室内天然光临界照度 (lx)
Ⅱ	设计室、绘图室	3	150
Ⅲ	办公室 视屏工作室、会议室	2	100
Ⅳ	复印室、档案室	1	50
Ⅴ	走道、楼梯间、卫生间	0.5	25

3 学校建筑的采光系数标准值必须符合 7.1.1-3 的规定。

表 7.1.1-3 学校建筑的采光系数标准值

采光等级	房间名称	侧面采光	
		采光系数最低值 C_{min}(%)	室内天然光临界照度 (lx)
Ⅲ	教室、阶梯教室实验室、报告厅	2	100
Ⅴ	走道、楼梯间、卫生间	0.5	25

4 图书馆建筑的采光系数标准值应符合表 7.1.1-4 的规定。

表 7.1.1-4 图书馆建筑的采光系数标准值

采光等级	房间名称	侧面采光		顶部采光	
		采光系数最低值 C_{min}(%)	室内天然光临界照度(lx)	采光系数平均值 C_{av}(%)	室内天然光临界照度(lx)
Ⅲ	阅览室、开架书库	2	100	—	—
Ⅳ	目录室	1	50	1.5	75
Ⅴ	书库、走道、楼梯间、卫生间	0.5	25	—	—

5 医院建筑的采光系数标准值应符合表 7.1.1-5 的规定。

表 7.1.1-5 医院建筑的采光系数标准值

采光等级	房间名称	侧面采光		顶部采光	
		采光系数最低值 C_{min}(%)	室内天然光临界照度(lx)	采光系数平均值 C_{av}(%)	室内天然光临界照度(lx)
Ⅲ	诊室、药房、治疗室、化验室	2	100	—	—
Ⅳ	候诊室、挂号处、综合大厅 病房、医生办公室(护士室)	1	50	1.5	75
Ⅴ	走道、楼梯间、卫生间	0.5	25	—	—

注：表 7.1.1-1 至 7.1.1-5 所列采光系数标准值适用于Ⅲ类光气候区。其他地区的采光系数标准值应乘以相应地区光气候系数。

7.1.2 有效采光面积计算应符合下列规定：

1 侧窗采光口离地面高度在 0.80m 以下的部分不应计入有效采光面积；

2 侧窗采光口上部有效宽度超过 1m 以上的外廊、阳台等外挑遮挡物，其有效采光面积可按采光口面积的 70%计算；

3 平天窗采光时，其有效采光面积可按侧面采光口面积的 2.50 倍计算。

7.2 通 风

7.2.1 建筑物室内应有与室外空气直接流通的窗口或洞口，否则应设自然通风道或机械通风设施。

7.2.2 采用直接自然通风的空间，其通风开口面积应符合下列规定：

1 生活、工作的房间的通风开口有效面积不应小于该房间地板面积的1/20；

2 厨房的通风开口有效面积不应小于该房间地板面积的1/10，并不得小于 0.60m²，厨房的炉灶上方应安装排除油烟设备，并设排烟道。

7.2.3 严寒地区居住用房，厨房、卫生间应设自然通风道或通风换气设施。

7.2.4 无外窗的浴室和厕所应设机械通风换气设施，并设通风道。

7.2.5 厨房、卫生间的门的下方应设进风固定百叶，或留有进风缝隙。

7.2.6 自然通风道的位置应设于窗户或进风口相对的一面。

7.3 保　温

7.3.1 建筑物宜布置在向阳、无日照遮挡、避风地段。

7.3.2 设置供热的建筑物体形应减少外表面积。

7.3.3 严寒地区的建筑物宜采用围护结构外保温技术，并不应设置开敞的楼梯间和外廊，其出入口应设门斗或采取其他防寒措施；寒冷地区的建筑物不宜设置开敞的楼梯间和外廊，其出入口宜设门斗或采取其他防寒措施。

7.3.4 建筑物的外门窗应减少其缝隙长度，并采取密封措施，宜选用节能型外门窗。

7.3.5 严寒和寒冷地区设置集中供暖的建筑物，其建筑热工和采暖设计应符合有关节能设计标准的规定。

7.3.6 夏热冬冷地区、夏热冬暖地区建筑物的建筑节能设计应符合有关节能设计标准的规定。

7.4 防　热

7.4.1 夏季防热的建筑物应符合下列规定：

1 建筑物的夏季防热应采取绿化环境、组织有效自然通风、外围护结构隔热和设置建筑遮阳等综合措施；

2 建筑群的总体布局、建筑物的平面空间组织、剖面设计和门窗的设置，应有利于组织室内通风；

3 建筑物的东、西向窗户，外墙和屋顶应采取有效的遮阳和隔热措施；

4 建筑物的外围护结构，应进行夏季隔热设计，并应符合有关节能设计标准的规定。

7.4.2 设置空气调节的建筑物应符合下列规定：

1 建筑物的体形应减少外表面积；

2 设置空气调节的房间应相对集中布置；

3 空气调节房间的外部窗户应有良好的密闭性和隔热性；向阳的窗户宜设遮阳设施，并宜采用节能窗；

4 设置非中央空气调节设施的建筑物，应统一设计、安装空调机的室外机位置，并使冷凝水有组织排水；

5 间歇使用的空气调节建筑，其外围护结构内侧和内围护结构宜采用轻质材料；连续使用的空调建筑，其外围结构内侧和内围护结构宜采用重质材料；

6 建筑物外围护结构应符合有关节能设计标准的规定。

7.5 隔　声

7.5.1 民用建筑各类主要用房的室内允许噪声级应符合表 7.5.1 的规定。

表 7.5.1　室内允许噪声级(昼间)

建筑类别	房间名称	允许噪声级(A声级,dB)			
		特级	一级	二级	三级
住宅	卧室、书房	—	≤40	≤45	≤50
	起居室	—	≤45	≤50	≤50
学校	有特殊安静要求的房间	—	≤40	—	—
	一般教室	—	—	≤50	—
	无特殊安静要求的房间	—	—	—	≤55
医院	病房、医务人员休息室	—	≤40	≤45	≤50
	门诊室	—	≤55	≤55	≤60
	手术室	—	≤45	≤45	≤50
	听力测听室	—	≤25	≤25	≤30
旅馆	客　房	≤35	≤40	≤45	≤55
	会议室	≤40	≤45	≤50	≤50
	多用途大厅	≤40	≤45	≤50	—
	办公室	≤45	≤50	≤55	≤55
	餐厅、宴会厅	≤50	≤55	≤60	—

注:夜间室内允许噪声级的数值比昼间小 10dB(A)。

7.5.2　不同房间围护结构(隔墙、楼板)的空气声隔声标准应符合表 7.5.2 规定。

表 7.5.2　空气声隔声标准

建筑类别	围护结构部位	计权隔声量(dB)			
		特级	一级	二级	三级
住宅	分户墙、楼板	—	≥50	≥45	≥40
学校	隔墙、楼板	—	≥50	≥45	≥40
医院	病房与病房之间	—	≥45	≥40	≥35
	病房与产生噪声房间之间	—	≥50	≥50	≥45
	手术室与病房之间	—	≥50	≥45	≥40
	手术室与产生噪声房间之间	—	≥50	≥50	≥45
	听力测听室围护结构	—	≥50	≥50	≥50
旅馆	客房与客房间隔墙	≥50	≥45	≥40	≥40
	客房与走廊间隔墙(含门)	≥40	≥40	≥35	≥30
	客房外墙(含窗)	≥40	≥35	≥25	≥20

7.5.3　不同房间楼板撞击声隔声标准应符合表 7.5.3 的规定。

7.5.4　民用建筑的隔声减噪设计应符合下列规定:

1　对于结构整体性较强的民用建筑,应对附着于墙体和楼板的传声源部件采取防止结构声传播的措施;

2　有噪声和振动的设备用房应采取隔声、隔振和吸声的措施,并应对设备和管道采取减振、消声处理;平面布置中,不宜将有噪声和振动的设备用房设在主要用房的直接

上层或贴邻布置，当其设在同一楼层时，应分区布置；

3　安静要求较高的房间内设置吊顶时，应将隔墙砌至梁、板底面；采用轻质隔墙时，其隔声性能应符合有关隔声标准的规定。

表 7.5.3　撞击声隔声标准

建筑类别	楼板部位	计权标准化撞击声压级(dB)			
		特级	一级	二级	三级
住宅	分户层间	—	≤65	≤75	≤75
学校	教室层间	—	≤65	≤65	≤75
医院	病房与病房之间	—	≤65	≤75	≤75
	病房与手术室之间	—	—	≤75	≤75
	听力测听室上部	—	≤65	≤65	≤65
旅馆	客房层间	≤55	≤65	≤75	≤75
	客房与有振动房间之间	≤55	≤55	≤65	≤65

8 建筑设备

8.1 给水和排水

8.1.1 民用建筑给水排水设计应满足生活和消防等要求。

8.1.2 生活饮用水的水质，应符合国家现行有关生活饮用水卫生标准的规定。

8.1.3 生活饮用水水池(箱)应与其他用水的水池(箱)分开设置。

8.1.4 建筑物内的生活饮用水水池、水箱的池(箱)体应采用独立结构形式，不得利用建筑物的本体结构作为水池和水箱的壁板、底板及顶板。生活饮用水池(箱)的材质、衬砌材料和内壁涂料不得影响水质。

8.1.5 埋地生活饮用水贮水池周围 10m 以内，不得有化粪池、污水处理构筑物、渗水井、垃圾堆放点等污染源，周围 2m 以内不得有污水管和污染物。

8.1.6 建筑给水设计应符合下列规定：

1 宜实行分质供水，优先采用循环或重复利用的给水系统；

2 应采用节水型卫生洁具和水嘴；

3 住宅应分户设置水表计量，公共建筑的不同用户应分设水表计量；

4 建筑物内的生活给水系统及消防供水系统的压力应符合给排水设计规范和防火规范有关规定；

5 条件许可的新建居住区和公共建筑中可设置管道直饮水系统。

8.1.7 建筑排水应遵循雨水与生活排水分流的原则排出，并应遵循国家或地方有关规定确定设置中水系统。

8.1.8 在水资源紧缺地区，应充分开发利用小区和屋面雨水资源，并因地制宜，将雨水经适当处理后采用入渗和贮存等利用方式。

8.1.9 排水管道不得布置在食堂、饮食业的主副食操作烹调备餐部位的上方，也不得穿越生活饮用水池部位的上方。

8.1.10 室内给水排水管道不得布置在遇水会引起燃烧、爆炸的原料、产品和设备的上面。

8.1.11 排水立管不得穿越卧室、病房等对卫生、安静有较高要求的房间，并不宜靠近与卧室相邻的内墙。

8.1.12 给排水管不应穿越配变电房、档案室、电梯机房、通信机房、大中型计算机网络中心、音像库房等遇水会损坏设备和引发事故的房间内。

8.1.13 给排水管穿越地下室外墙或地下构造物的墙壁处，应采取防水措施。

8.1.14 给水泵房、排水泵房不得设置在有安静要求的房间上面、下面和毗邻的房间内；泵房内应设排水设施，地面应设防水层；泵房内应有隔振防噪设置。消防泵房应符合防火规范的有关规定。

8.1.15 卫生洁具、水泵、冷却塔等给排水设备、管材应选用低噪声的产品。

8.2 暖通和空调

8.2.1 民用建筑中暖通空调系统及其冷热源系统的设计应满足安全、卫生和建筑物功能的要求。

8.2.2 室内空气设计参数及其卫生要求应符合现行国家标准《采暖通风与空气调节设计规范》GB 50019 及其他相关标准的规定。

8.2.3 采暖设计应符合下列要求：

1 民用建筑采暖系统的热媒宜采用热水；

2 居住建筑采暖系统应有实现热计量的条件；

3 住宅楼集中采暖系统需要专业人员调节、检查、维护的阀门、仪表等装置不应设置在私有套型内；一个私有套型中不应设置其他套型所用的阀门、仪表等装置；

4 采暖系统中的散热器、管道及其连接件应满足系统承压要求。

8.2.4 通风系统应符合下列要求：

1 机械通风系统的进风口应设置在室外空气清新、洁净的位置；

2 废气排放不应设置在有人停留或通行的地带；

3 机械通风系统的管道应选用不燃材料；

4 通风机房不宜与有噪声限制的房间相邻布置；

5 通风机房的隔墙及隔墙上的门应符合防火规范的有关规定。

8.2.5 空气调节系统应符合下列要求：

1 空气调节系统的民用建筑，其层高、吊顶高度应满足空调系统的需要；

2 空气调节系统的风管管道应选用不燃材料；

3 空气调节机房不宜与有噪声限制的房间相邻；

4 空气调节系统的新风采集口应设置在室外空气清新、洁净的位置；

5 空调机房的隔墙及隔墙上的门应符合防火规范的有关规定。

8.2.6 民用建筑中的冷冻机房、水泵房、换热站等的设置应符合下列要求：

1 应预留大型设备的进入口；有条件时，在机房内适当位置预留吊装设施；

2 宜采用压光水泥地面，并应设置冲洗地面的上、下水设施；在设备可能漏水、泄水的位置，设地漏或排水明沟；

3 宜设置修理间、值班室、厕所以及对外通讯和应急照明；

4 设备布置应保证操作方便，并有检修空间；

5 应防止设备振动可能导致的不利影响；

6 有通风换气要求的房间，当室内只设置送风口或只设置排风口时，应能保证关门时室内空气可以流动；既有送风，又有排风的房间，送、排风口的位置应避免气流短路。

8.2.7 居住区集中锅炉房位置应防止燃料运输、噪声、污染物排放等对居住区环境的影响。建筑物、构筑物和场地布置应符合现行国家标准《锅炉房设计规范》GB 50041 的有关规定。

8.2.8 为民用建筑服务的燃油、燃气锅炉房(或其他有燃烧过程的设备用房)不宜设置在主体建筑中。需要设置在主体建筑中时,应符合有关规范和当地消防、安全等部门的规定。

8.3 建筑电气

8.3.1 民用建筑物内配变电所,应符合下列要求:

1 配变电所位置的选择,应符合下列要求:

1)宜接近用电负荷中心;

2)应方便进出线;

3)应方便设备吊装运输;

4)不应设在厕所、浴室或其他经常积水场所的正下方,且不宜与上述场所相贴邻;装有可燃油电气设备的变配电室,不应设在人员密集场所的正上方、正下方、贴邻和疏散出口的两旁;

5)当配变电所的正上方、正下方为住宅、客房、办公室等场所时,配变电所应作屏蔽处理。

2 安装可燃油油浸电力变压器总容量不超过1260kVA、单台容量不超过630kVA的变配电室可布置在建筑主体内首层或地下一层靠外墙部位,并应设直接对外的安全出口,变压器室的门应为甲级防火门;外墙开口部位上方,应设置宽度不小于1m不燃烧体的防火挑檐;

3 可燃油油浸电力变压器室的耐火等级应为一级,高压配电室的耐火等级不应低于二级,低压配电室的耐火等级不应低于三级,屋顶承重构件的耐火等级不应低于二级;

4 不带可燃油的高、低压配电装置和非油浸的电力变压器,可设置在同一房间内;

5 高压配电室宜设不能开启的距室外地坪不低于1.80m的自然采光窗,低压配电室可设能开启的不临街的自然采光窗;

6 长度大于7m的配电室应在配电室的两端各设一个出口,长度大于60m时,应增加一个出口;

7 变压器室、配电室的进出口门应向外开启;

8 变压器室、配电室等应设置防雨雪和小动物从采光窗、通风窗、门、电缆沟等进入室内的设施;

9 变配电室的电缆夹层、电缆沟和电缆室应采取防水、排水措施;

10 变配电室不应有与其无关的管道和线路通过;

11 变配电室、控制室、楼层配电室宜做等电位联结;

12 变配电室重地应设与外界联络的通信接口、宜设出入口控制。

8.3.2 配变电所防火门的级别应符合下列要求:

1 设在高层建筑内的配变电所,应采用耐火极限不低于2h的隔墙、耐火极限不低于1.50h的楼板和甲级防火门与其他部位隔开;

2 可燃油油浸变压器室通向配电室或变压器室之间的门应为甲级防火门;

3　配变电所内部相通的门，宜为丙级的防火门；

4　配变电所直接通向室外的门，应为丙级防火门。

8.3.3　柴油发电机房应符合下列要求：

1　柴油发电机房的位置选择及其他要求应符合本通则第 8.3.1 条的要求；

2　柴油发电机房宜设有发电机间、控制及配电室、储油间、备件贮藏间等；设计时可根据具体情况对上述房间进行合并或增减；

3　发电机间应有两个出入口，其中一个出口的大小应满足运输机组的需要，否则应预留吊装孔；

4　发电机间出入口的门应向外开启；发电机间与控制室或配电室之间的门和观察窗应采取防火措施，门开向发电机间；

5　柴油发电机组宜靠近一级负荷或变配电室设置；

6　柴油发电机房可布置在高层建筑裙房的首层或地下一层，并应符合下列要求：

1)柴油发电机房应采用耐火极限不低于 2h 或 3h 的隔墙和 1.50h 的楼板、甲级防火门与其他部位隔开；

2)柴油发电机房内应设置储油间，其总储存量不应超过 8h 的需要量，储油间应采用防火墙与发电机间隔开；当必须在防火墙上开门时，应设置能自行关闭的甲级防火门；

3)应设置火灾自动报警系统和自动灭火系统；

4)柴油发电机房设置在地下一层时，至少应有一侧靠外墙，热风和排烟管道应伸出室外。排烟管道的设置应达到环境保护要求；

7　柴油发电机房进风口宜设在正对发电机端或发电机端两侧；

8　柴油发电机房应采取机组消声及机房隔声综合治理措施。

8.3.4　智能化系统机房应符合下列要求：

1　智能化系统的机房主要有：消防控制室、安防监控中心、电信机房、卫星接收及有线电视机房、计算机机房、建筑设备监控机房、有线广播及(厅堂)扩声机房等；

2　智能化系统的机房可单独设置，也可合用设置，并应符合下列要求：

1)消防控制室、安防监控中心的设置应符合有关消防、安防规范；

2)消防控制室、安防监控中心宜设在建筑物的首层或地下一层，且应采用耐火极限不低于 2h 或 3h 的隔墙和耐火极限不低于 1.50h 或 2h 的楼板与其他部位隔开，并应设直通室外的安全出口；

3)消防控制室与其他控制室合用时，消防设备在室内应占有独立的工作区域，且相互间不会产生干扰；

4)安防监控中心与其他控制室合用时，风险等级应得到主管安防部门的确认；

5)智能化系统的机房宜铺设架空地板、网络地板或地面线槽；宜采用防静电、防尘材料；机房净高不宜小于 2.50m；

6)机房室内温度冬天不宜低于 18℃，夏天不宜高于 27℃；室内湿度冬天宜大于 30%，夏天宜小于 65%；

7)智能化系统的机房不应设在厕所、浴室或其他经常积水场所的正下方，且不宜与上述场所相贴邻；

3 智能化系统的重要机房应远离强磁场所；

4 智能化系统的设备用房应在初步设计中预留位置及线路敷设通道；

5 智能化系统的重要机房应做好自身的物防、技防；

6 智能化系统应根据系统的风险评估采取防雷措施，应做等电位联结。

8.3.5 电气竖井、智能化系统竖井应符合下列要求：

1 高层建筑电气竖井在利用通道作为检修面积时，竖井的净宽度不宜小于0.80m；

2 高层建筑智能化系统竖井在利用通道作为检修面积时，竖井的净宽度不宜小于0.60m；多层建筑智能化系统竖井在利用通道作为检修面积时，竖井的净宽度不宜小于0.35m；

3 电气竖井、智能化系统竖井内宜预留电源插座，应设应急照明灯，控制开关宜安装在竖井外；

4 智能化系统竖井宜与电气竖井分别设置，其地坪或门槛宜高出本层地坪0.15～0.30m；

5 电气竖井、智能化系统竖井井壁应为耐火极限不低于1h的不燃烧体，检修门应采用不低于丙级的防火门；

6 电气竖井、智能化系统竖井内的环境指标应保证设备正常运行。

8.3.6 线路敷设应符合下列要求：

1 线路敷设应符合现行国家标准《建筑电气工程施工质量验收规范》GB 50303的规定；

2 智能化系统的缆线宜穿金属管或在金属线槽内敷设；

3 暗敷在楼板、墙体、柱内的缆线(有防火要求的缆线除外)，其保护管的覆盖层不应小于15mm；

4 楼板的厚度、建筑物的层高应满足强电缆线及智能化系统缆线水平敷设所需的空间，并应与其他专业管线综合。

本通则用词说明

1　为便于在执行本通则条文时区别对待，对要求严格程度不同的用词说明如下：

1）表示很严格，非这样做不可的用词：

正面词采用“必须”；反面词采用“严禁”。

2）表示严格，在正常情况下均应这样做的用词：

正面词采用“应”；反面词采用“不应”或“不得”。

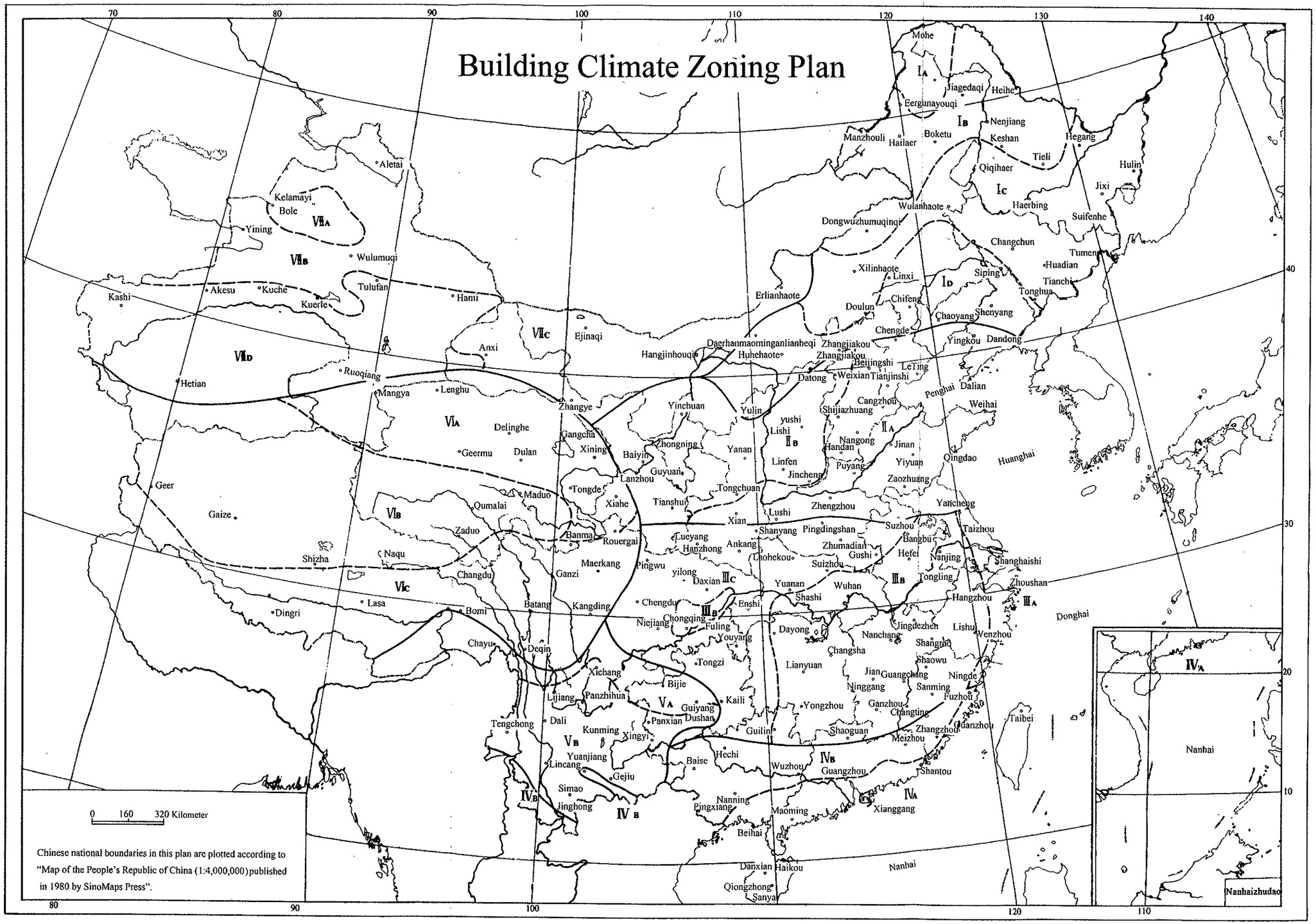
3）表示允许稍有选择，在条件许可时，首先应这样做的用词：

正面词采用“宜”；反面词采用“不宜”。

表示有选择，在一定条件下可以这样做的，采用“可”。

2　通则中指定应按其他有关标准、规范执行时，写法为：“应符合……规定”或“应按……执行”。

Appendix A Building Climate Zoning Plan



附录 A　中国建筑气候区划图

