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General technical requirements of emergency shelters

应急避难场所通用技术要求

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1 Scope

This document specifies the general technical requirements for the planning, design, construction, management and maintenance, use and inspection and assessment of emergency shelters.

This document applies to the planning, design, construction, management and maintenance, use and inspection and assessment of emergency shelters.

4 General requirements

4.1 Public facilities for education, sport, culture and tourism in town and countryside, together with resources for disaster prevention, air defence and epidemic control, shall be planned as a whole for dual everyday and emergency use, built jointly and used jointly.

4.2 The geographical and geological setting, the meteorological and hydrological conditions, the distribution of the urban and rural population, land resources, public facilities and open space, and the risk of disaster and accident shall all be taken together, and shelters of a suitable class and type planned and designed accordingly.

4.3 The specialised plan for emergency shelters shall be followed, and shelters of every class and type shall be built, maintained and used to local conditions, taking account of economic and social development.

5 Planning

5.1.1 All sources of emergency risk faced within the planning area shall be reviewed, and the kinds of risk, their size, the degree of their effect and their spatial distribution determined.

5.1.2 Taking the emergency risks of the planning area as a whole, the number of people who would need shelter, their age composition and their spatial distribution shall be analysed.

5.2.1 The resources available within the planning area for disaster, air defence and epidemic shelter shall be surveyed, including their location, type, building and site conditions, the kinds of sheltering they suit, the usable shelter area and the state of the infrastructure.

5.2.2 The safety, the level of protective design and the accessibility of those resources shall be assessed, and resources unsuited to serve as emergency shelters excluded.

5.3 The spatial distribution and construction requirements for shelters of different classes and types shall be set out in accordance with GB/T 44013, and shelters of a suitable class and type designed accordingly.

5.4.1 The siting of a shelter shall meet safety requirements: it shall avoid seismic fault zones, sites and danger areas of geological hazard and areas at risk of flood, and shall be well clear of flood discharge areas, reservoir spillway areas and areas threatened by mountain torrents, of high voltage line corridors, oil and gas pipelines, hazardous chemical storage areas, large chemical parks, tailings ponds and stores of flammable, explosive or nuclear material, and of the collapse range of buildings and structures.

5.4.2 The siting shall meet requirements of convenience: transport around the site shall be easy, so that people can reach it and vehicles, equipment and supplies can be delivered.

5.4.3 The site shall be easy to connect to municipal infrastructure and shall have power, water and drainage capacity.

5.4.4 The layout of shelters shall follow territorial spatial planning, so that the total is sufficient and what already exists is used to the full, overlapping service areas are avoided and blind spots are covered as far as possible.

6 Design

6.1.1 The general layout design shall take together the terrain, the landform, the climate, the hydrology, the geology, the vegetation cover and the sheltering needs.

6.1.2 It shall cover the building layout, the functional zones, the entrances and exits, the pipe and cable networks and the barrier-free provisions.

6.1.3 The general layout shall meet the following: a reasonable building layout with clear functional zoning, smooth circulation and convenient management and maintenance,

satisfying local planning requirements; outdoor ground that is fairly level, allows air to circulate and drains easily; two or more entrances connecting to roads in different directions, the main routes to them meeting the requirements for firefighting, safe evacuation and the passage of vehicles for supplies and medical rescue as well as the fire separation widths of GB 55037; emergency parking whose number of spaces, width and height give priority to rescue vehicles; and barrier-free design complying with GB 50763.

6.2.1 The design of the shelter grounds shall keep the flow of people, vehicles and goods reasonably separated and shall favour firefighting, parking, the assembly and dispersal of sheltering people and the placing of barrier-free facilities.

6.2.2 The number and width of emergency routes within the grounds shall suit the length of the stay, the number of people who can be accommodated and the requirements of the functional zones.

6.2.3 The spacing between shelter buildings shall meet local planning requirements for daylight, lighting, ventilation, firefighting, disaster prevention, buried services and visual hygiene.

6.2.4 Shelter buildings and their structures shall meet the design requirements for earthquake, flood, waterlogging, lightning, wind and fire.

6.2.5 The supporting facilities, the direction of the evacuation routes and the width of the stairs and safety exits shall be designed for the number of people to be accommodated.

6.3.1 An emergency shelter shall have zones for emergency assembly, command and management, medical treatment, supply storage, washing, refuse storage and transfer, and emergency parking.

6.3.2 A short-term shelter shall add to those zones for sleeping accommodation, epidemic isolation and catering.

6.3.3 A long-term shelter shall add to those zones for cultural and sporting activity, temporary teaching, public services and helicopter landing.

6.3.4 Each zone shall connect to the internal emergency routes and shall be signed in accordance with GB/T 44014; fire routes shall be laid out between zones in accordance with the fire safety rules.

6.3.6 In an outdoor shelter the zones shall be laid out taking together the terrain, the water, the wind direction, the vegetation cover and the effective shelter area; in an indoor shelter they shall be laid out with regard to the everyday use of the rooms.

6.3.9 The emergency assembly zone shall be placed so that it connects easily to the main route through the shelter, with ground space and assembly facilities that let people gather and disperse quickly.

6.3.10 The sleeping zone shall be placed where people can be evacuated safely; it shall be

laid out with sleeping and supporting facilities and should be grouped by the number of people to be accommodated, the effective shelter area, the number of families and the ratio of men to women, with the necessary provision for privacy.

6.3.11 The command and management zone should use the existing office area or control room of the site and shall be provided with an emergency communication interface.

6.3.12 The medical treatment zone shall have its own water point and refuse collection point.

6.3.13 The washing zone shall be designed with water supply and drainage, placed with the sleeping zone but at a hygienic separation distance from it.

6.3.14 The refuse storage and transfer zone shall be placed downwind of the prevailing wind direction and at a hygienic separation distance from the other zones.

6.3.15 The emergency parking zone shall use the existing spaces of the site or usable ground within 500 m around it, the width and height of the main routes and the size of the spaces giving priority to rescue vehicles.

6.3.16 The helicopter landing zone shall be placed on open, level ground with nothing to obstruct take-off and landing, and shall meet the following. The landing pad shall be large enough to contain a circle of diameter not less than 1.5 times the overall length of the helicopter; where a rectangular pad is used its length shall be not less than 1.5 times the length of the helicopter and its width not less than 1.5 times the rotor diameter. The pad shall be clearly marked in yellow or white, showing the rated helicopter load, the main approach and departure direction, the landing area and the safety area. A safety area shall be provided around the final approach and take-off area, extending at least 3 m from its edge or 0.25 times the overall length of the helicopter, whichever is greater; apart from frangible objects placed there for functional reasons there shall be no fixed object in the safety area, and frangible objects shall not project above a surface rising outwards at 5 percent from a line 25 cm above the edge of the final approach and take-off area. The pad shall have not less than two exits, each of a width not less than 1.5 m.

6.4.1 Equipment and supplies shall be provided according to the type of shelter, taking account of the disaster environment, the climate, the level of economic and social development and the building and site conditions, and comfort and convenience shall be improved once the basic sheltering functions are met.

6.4.2 An emergency shelter shall be equipped for up to one day of emergency refuge, with facilities and supplies for assembly, command, medical aid, storage, washing, refuse handling, parking, water supply, power supply, ventilation, firefighting, heating or cooling, emergency routes, emergency repair and construction, barrier-free access and signage.

6.4.3 A short-term shelter shall add to those the facilities and supplies for 2 to 14 days of sheltering: sleeping accommodation, epidemic isolation, catering, emergency drainage and