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Assessment standard for green building

绿色建筑评价标准

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Assessment standard for green building

1 General provisions

1.0.1 In order to implement the concept of green development, promote the high-quality development of green buildings, save resources, protect the environment, meet the people's growing needs for a better life, this standard is formulated.

1.0.2 This standard applies to the assessment of the green performance of civil buildings.

1.0.3 The assessment of green buildings shall follow the principle of adapting measures to local conditions, combining the characteristics of the climate, environment, resources, economy and culture of the area where the building is located, to make comprehensive assessment of such performances as safety, durability, health and comfort, living convenience, resource conservation, and environmental livability.

1.0.4 The site design and architectural layout of green buildings shall be combined with the topography and geomorphology; the architectural layout shall be adapted to the climatic conditions and geographical environment of the site; the wind environment, light environment, thermal environment, acoustic environment of the site shall be organized and utilized.

1.0.5 In addition to complying with the provisions of this standard, the assessment of green buildings shall also comply with the provisions of relevant national standards.

2 Terms

2.0.1 Green building

A high-quality building which, during the whole life cycle, saves resources, protects the environment, reduces pollution, provides people with healthy, applicable and efficient use of space, maximizes the realization of harmonious coexistence between man and nature.

2.0.2 Green performance

It involves the comprehensive performance of building safety and durability, health and comfort, living convenience, resource saving (land saving, energy

saving, water saving, material saving) and environmental livability.

2.0.3 Decorated

Before delivery, all interior walls, top surfaces, floors of residential buildings are paved and painted, doors and windows, fixed furniture, equipment pipelines, switch sockets, kitchen and toilet fixtures are installed in place; all fixed surfaces in public areas of public buildings are paved and painted; basic equipment such as water, heating, electricity and ventilation are all installed in place.

2.0.4 Heat island intensity

The difference between the temperature in an area of a city and the temperature in the suburbs, expressed by the difference between the temperature at the representative measurement points of the two, which is the characterizing parameter of the urban heat island effect.

2.0.5 Green building material

The building materials which, during the whole life cycle, can reduce the consumption of resources and reduce the impact on the ecological environment, has the characteristics of energy saving, emission reduction, safety, health, convenience and recyclability.

3 Basic requirements

3.1 General requirements

3.1.1 The green building assessment shall take a single building or a group of buildings as the assessment object. The assessment object shall implement and deepen the green development requirements as put forward by the upper-level statutory planning and related special plans; the systematic and holistic indicators shall be evaluated based on the overall situation of the engineering project to which the building belongs.

3.1.2 Green building assessment shall be carried out after the completion of the construction project. Pre-assessment can be carried out after the construction drawing design of the construction project is completed.

3.1.3 The assessment applicant shall conduct full-life technical and economic analysis of the participating buildings; select appropriate technologies, equipment and materials; control the entire process of planning, design, construction, operation; submit corresponding analysis and testing report and related documents during the assessment. The party applying for assessment shall be responsible for the authenticity and completeness of the submitted

The concentration reduction basis is the relevant requirements of the current national standard "Indoor air quality standard" GB/T 18883.

4 Safety and durability

4.1 Prerequisite items

4.1.1 The site shall avoid geologically dangerous areas such as landslides and mudslides. The flood-prone areas shall have reliable flood control infrastructure; the site shall be free from threats of hazardous chemicals, flammable and explosive sources; it shall be free from hazards of electromagnetic radiation and radon-containing soil.

4.1.2 The building structure shall meet the requirements of bearing capacity and building function. Building's exterior walls, roofs, doors and windows, curtain walls and external insulation and other enclosure structures shall meet the requirements of safety, durability and protection.

4.1.3 External facilities such as external shading, solar energy facilities, air-conditioning outdoor units, external wall flower ponds shall be designed and constructed uniformly with the main structure of the building; it shall have the installation, repair and maintenance conditions.

4.1.4 The non-structural components, equipment and auxiliary facilities inside the building shall be firmly connected and able to adapt to the deformation of the main structure.

4.1.5 The exterior doors and windows of the building must be installed firmly; their wind pressure resistance and watertightness performance shall comply with the current relevant national standards.

4.1.6 The floor of the toilet and bathroom shall be provided with a waterproof layer; the wall and ceiling shall be provided with a moisture-proof layer.

4.1.7 Passage spaces such as corridors and evacuation passages shall meet the requirements of emergency evacuation and emergency care; it shall be kept unblocked.

4.1.8 There shall be a warning and guidance marking system for safety protection.

4.2 Scoring items

I Safety

pedestrian and bicycle traffic systems have adequate lighting: the assessment score is 8 points.

II Durability

4.2.6 Take measures to improve the adaptability of buildings. The total assessment score is 18 points, which are scored and accumulated according to the following rules:

1 Adopt a universal, open, flexible and variable use space design, or take measures to change the use of the building's functions: 7 points;

2 Separate building structure from building equipment pipeline: 7 points;

3 Use equipment and facility layout methods or control methods that are compatible with building functions and spatial changes: 4 points.

4.2.7 Take measures to improve the durability of construction parts and components. The total assessment score is 10 points, which is scored and accumulated according to the following rules:

1 Use pipes, pipelines and fittings with good corrosion resistance, aging resistance and durability: 5 points;

2 Select long-life products for the active parts; consider the same life of the parts combination. When parts with different service life are combined, use a structure that is convenient for separate replacement, update and upgrade: 5 points.

4.2.8 Improve the durability of building structure materials. The total assessment score is 10 points, which are scored based on the following rules:

1 For durability design based on 100 years: 10 points.

2 Use building structural materials with good durability and meet one of the following conditions: 10 points:

1) For concrete members, increase the thickness of the protective layer of steel bar or use high-durability concrete;

2) For steel members, use weathering-resistance structural steel and weathering-resistance ant-corrosion paints;

3) For wood members, use ant-corrosion wood, durable wood or durable wood products.

4.2.9 Reasonably use durable and easy-to-maintain decoration building materials. The total assessment score is 9 points, which are respectively scored

national standard "Code for sound insulation design of civil buildings" GB 50118;

2 The sound insulation performance of exterior walls, partition walls, floors, doors and windows shall meet the minimum requirements in the current national standard "Code for sound insulation design of civil buildings" GB 50118.

5.1.5 Architectural lighting shall meet the following requirements:

1 The quantity and quality of lighting shall comply with the current national standard "Standard for lighting design of building" GB 50034;

2 The places where people stay for a long time shall adopt non-hazardous lighting products that comply with the current national standard "Photobiological safety of lamps and lamp systems" GB/T 20145;

3 The fluctuation depth of the light output waveform of the selected LED lighting products shall meet the requirements of the current national standard "Technical requirements for application of LED indoor lighting" GB/T 31831.

5.1.6 Measures shall be taken to protect the indoor thermal environment. For buildings with central heating and air-conditioning systems, the design parameters such as temperature, humidity, fresh air volume in the room shall comply with the relevant provisions of the current national standard "Design code for heating ventilation and air conditioning of civil buildings" GB 50736; for buildings with non-central heating and air-conditioning systems, there shall be measures or reserved conditions to protect the indoor thermal environment.

5.1.7 The thermal performance of the enclosure structure shall meet the following requirements:

1 Under the conditions of indoor design temperature and humidity, no condensation shall be allowed on the inner surface of the non-transparent building envelope;

2 There shall be no condensation on the roof and exterior walls of buildings with heating;

3 The thermal insulation performance of the roof and external walls shall meet the requirements of the current national standard "Code for thermal design of civil building" GB 50176.

5.1.8 The main function room shall have a thermal environment adjustment device independently controlled on site.

5.1.9 The underground garage shall be equipped with a carbon monoxide

5.2.6 Take measures to optimize the indoor acoustic environment of the main functional rooms. The total assessment score is 8 points. The noise level reaches the average of the low and high standard limits in the current national standard "Code for sound insulation design of civil buildings" GB 50118: 4 points. If it reaches the high standard limit: 8 points.

5.2.7 The sound insulation performance of the main functional rooms is good. The total assessment score is 10 points. They are respectively scored and accumulated according to the following rules:

1 The airborne sound insulation performance between the components and adjacent rooms reaches the average of the low and high standard limits in the current national standard "Code for sound insulation design of civil buildings" GB 50118: 3 points. If it reaches the high standard limit: 5 points;

2 The impact sound insulation performance of the floor slab reaches the average of the low and high standard limits in the current national standard "Code for sound insulation design of civil buildings" GB 50118: 3 points. If it reaches the high standard limit: 5 points.

5.2.8 Make full use of natural light. The total assessment score is 12 points, they are respectively scored and accumulated according to the following rules:

1 In at least 60% of the area proportion of the residential building's indoor main functional space, the number of hours with an illuminance value not less than 300 lx is not less than 8 h/d on average: 9 points.

2 Public buildings are scored and accumulated according to the following rules:

1) The proportion of the area whose daylighting coefficient meets the daylighting requirements in the inner zone reaches 60%: 3 points;

2) The ratio of the area of the underground space with an average daylighting coefficient of not less than 0.5% to the area of the first floor of the basement reaches more than 10%: 3 points;

3) The average number of hours where the lighting intensity value of the area with at least 60% area ratio of the main indoor functional space is not lower than the lighting requirements is not less than 4 h/d: 3 points.

3 The main function room has glare control measures: 3 points.

IV Indoor thermal environment

5.2.9 Have a good indoor hot and humid environment. The total assessment score is 8 points. The scoring is according to the following rules:

6 Occupant convenience

6.1 Prerequisite items

6.1.1 Buildings, outdoor venues, public green spaces, urban roads shall have a coherent barrier-free walking system.

6.1.2 There shall be public transportation stations within 500 m from the pedestrian entrance of the site or a dedicated shuttle bus that connects to the public transportation stations.

6.1.3 The parking lot shall have electric vehicle charging facilities or have the installation conditions for charging facilities, meanwhile it shall set up reasonable parking spaces for electric vehicles and barrier-free vehicles.

6.1.4 The location of the bicycle parking lot shall be reasonable and convenient for people.

6.1.5 The construction equipment management system shall have automatic monitoring and management functions.

6.1.6 The building shall be equipped with an information network system.

6.2 Scoring items

I Transit and accessibility

6.2.1 The connection between the venue and the public transportation station is convenient. The total assessment score is 8 points, which are scored and accumulated according to the following rules:

1 The walking distance of the site entrance & exit to the public transportation station is not more than 500 m, or the walking distance to the rail transit station is not more than 800 m: 2 points. The walking distance of the site entrance & exit to the public transportation station is not more than 300 m, or the walking distance to the rail transit station is not more than 500 m: 4 points;

2 There are no less than 2 lines of public transportation stations within 800 m walking distance from the site: 4 points.

6.2.2 The indoor and outdoor public areas of the building meet the full-age design requirements. The total assessment score is 8 points, which are scored and accumulated according to the following rules:

4) There is a social public parking lot (garage) within 500 m of the surrounding area;

5) The venue is not closed or the public walkway in the venue is open to the public.

6.2.4 Open spaces such as urban green spaces, squares and public sports venues can be reached on foot. The total assessment score is 5 points, which are scored and accumulated according to the following rules:

1 The walking distance from the entrance of the site to urban parks, green spaces, residential parks, squares is not more than 300 m: 3 points;

2 The walking distance to the medium-sized multifunctional sports venue is not more than 500 m: 2 points.

6.2.5 Set up fitness venues and spaces reasonably. The total assessment score is 10 points, which are scored and accumulated according to the following rules:

1 The outdoor fitness field area is not less than 0.5% of the total land area: 3 points;

2 Set up a dedicated fitness slow track with a width of not less than 1.25 m, meanwhile the length of the fitness slow track is not less than 1/4 of the circumference of the red line of the site and not less than 100 m: 2 points;

3 The indoor fitness space is not less than 0.3% of the above-ground building area and not less than 60 m^2: 3 points;

4 The stairwell has natural lighting and good vision, meanwhile the distance from the main population is not more than 15 m: 2 points.

III Intelligent operation

6.2.6 Set up an automatic remote metering system for classified and graded energy consumption; set up an energy management system to realize the monitoring, data analysis and management of building energy consumption. The assessment score is 8 points.

6.2.7 Set up the air quality monitoring system for PM_{10}, $PM_{2.5}$ and CO_2 concentrations; have the functions of storing monitoring data for at least one year and real-time display. The assessment score is 5 points.

6.2.8 Set up a water remote metering system and an online water quality monitoring system. The total assessment score is 7 points, which are scored and accumulated according to the following rules:

1 Set up a water consumption remote metering system, which can classify,

water saving quota and not greater than the average value: 3 points.

3 If the average daily water consumption is not greater than the lower limit of the water saving quota: 5 points.

6.2.12 Regularly evaluate the building operation effect; optimize the operation based on the results. The total assessment score is 12 points. They are scored and accumulated according to the following rules:

1 Develop technical plans and plans for the assessment of green building operation effects: 3 points;

2 Regularly check an adjust public facilities and equipment, with records of inspection, debugging, operation and calibration; meanwhile the records are complete: 3 points;

3 Carry out energy-saving diagnosis and assessment regularly, and formulate and implement an optimization plan based on the assessment results: 4 points;

4 Regularly inspect and publicize various types of water and water quality: 2 points.

6.2.13 Establish a green education and publicity and practice mechanism; compile a manual for the use of green facilities; form a good green atmosphere; regularly conduct user satisfaction surveys. The total assessment score is 8 points. They are respectively scored and accumulated according to the following rules:

1 Organize no less than twice a year green building technology publicity, green life guidance, disaster emergency drills and other green education publicity and practical activities; have activity records: 2 points;

2 Have a platform for green life display, experience or exchange and sharing; provide users with a manual for green facilities: 3 points;

3 Carry out a user satisfaction survey on the green performance of the building once a year; formulate improvement measures based on the survey results; implement and publicize them: 3 points.

7 Resource saving

7.1 Prerequisite items

7.1.1 The energy-saving design of the building's shape, plane layout, spatial scale, envelope structure shall be combined with the natural conditions of the

assessment score is 15 points. It is scored according to the following rules:

1 The water efficiency rating of all sanitary appliances reaches grade 2: 8 points.

2 If the water efficiency grade of more than 50% sanitary appliances reaches grade 1, meanwhile the others reach grade 2: 12 points.

3 The water efficiency rating of all sanitary appliances reaches grade 1: 15 points.

7.2.11 Water-saving equipment or technology is used in the green irrigation and air-conditioning cooling water system. The total assessment score is 12 points, which are scored and accumulated according to the following rules:

1 Water-saving equipment or technology is used for green irrigation, which is scored according to the following rules:

1) Use water-saving irrigation system: 4 points.

2) On the basis of using the water-saving irrigation system, take water-saving control measures such as soil moisture sensors and automatic shut-off devices in rainy days, or use plants without permanent irrigation: 6 points.

2 The air conditioning cooling water system adopts water-saving equipment or technology, which is scored according to the following rules:

1) The circulating cooling water system adopts methods such as taking water treatment measures, enlarging the water collecting tray, setting up a balance pipe or balance water tank, etc., to avoid cooling water overflow when the cooling water pump stops: 3 points.

2) Use cooling technology without evaporative water consumption: 6 points.

7.2.12 Combined with rainwater comprehensive utilization facilities to create an outdoor landscape water body, the water replenishment of the outdoor landscape water body using rainwater is greater than 60% of the water body evaporation, meanwhile use the ecological water treatment technology that guarantees the water quality of the water body. The total assessment score is 8 points, which are respectively scored and accumulated according to the following rules:

1 For rainwater entering the outdoor landscape water body, use ecological facilities to reduce runoff contamination: 4 points;

2 Use aquatic animals and plants to ensure the water quality of outdoor

points.

3 Mixed structure: The concrete structure part and the steel structure part shall be evaluated in accordance with the first and second paragraphs of this article; the score shall be the average of the scores.

7.2.16 Industrialized interior parts are selected for building decoration. The total assessment score is 8 points. For architectural decoration, if the proportion of industrialized interior parts accounted for more than 50% of the consumption of similar parts, 3 points are awarded for 1 type; 5 points for 3 types; 8 points for 3 or more types.

7.2.17 Select recyclable materials, reusable materials and waste building materials. The total assessment score is 12 points. They are respectively scored and accumulated according to the following rules:

1 The ratio of recyclable materials to reusable materials is scored according to the following rules:

1) It reaches 6% for residential buildings or 10% for public buildings: 3 points.

2) It reaches 10% for residential buildings or 15% for public buildings: 6 points.

2 The selection and consumption ratio of waste building materials shall be scored according to the following rules:

1) Use a kind of waste building materials that accounts for no less than 50% of the consumption of similar building materials: 3 points.

2) Select two or more waste building materials, each of which accounts for no less than 30% of the consumption of similar building materials: 6 points.

7.2.18 Select green building materials. The total assessment score is 12 points. The proportion of green building materials is not less than 30%: 4 points. It is not less than 50%: 8 points. It is not less than 70%: 12 points.

8 Environment livability

8.1 Prerequisite items

8.1.1 The planning and layout of the building shall meet the sunshine standard, meanwhile it shall not lower the sunshine standard of surrounding buildings.

catching. The smoking area is set up with warning signs that smoking is harmful to health: 4 points.

8.2.5 Use site space to set up green rainwater infrastructure. The total assessment score is 15 points, which are scored and accumulated according to the following rules:

1 Recessed green spaces, rain gardens and other green spaces and water bodies that have the function of regulating and storing rainwater account for 40% of the total green space: 3 points; accounts for 60%: 5 points;

2 Connect and guide at least 80% of roof rainwater into the ground ecological facilities: 3 points;

3 Connect and guide no less than 80% of road rainwater into the ground ecological facilities: 4 points;

4 The proportion of permeable pavement area in hard pavement reaches 50%: 3 points.

II Outdoor physical environment

8.2.6 The environmental noise in the site is better than the requirements of the current national standard "Standard of environmental noise of urban area" GB 3096. The total assessment score is 10 points. It is scored based on the following rules:

1 The environmental noise value is greater than the standard limit of the category 2 acoustic environment functional area and less than or equal to the standard limit of the category 3 acoustic environment functional area: 5 points.

2 The environmental noise value is less than or equal to the standard limit of the category 2 acoustic environment functional area: 10 points.

8.2.7 Building and lighting design avoid light pollution. The total assessment score is 10 points. They are scored and accumulated according to the following rules:

1 The visible light reflectance of the glass curtain wall and the impact of the reflected light on the surrounding environment meet the requirements of the "Optical and thermal performance of glass curtain wall" GB/T 18091: 5 points;

2 The limit of light pollution of outdoor night scene lighting complies with the current national standard "Specification for limitation to obtrusive light of outdoor lighting" GB/T 35626 and the current industry standard "Code for lighting design of urban nightscape" JGJ/T 163: 5 points.

9 Promotion and innovation

9.1 General requirements

9.1.1 When evaluating green buildings, improvement and innovation items shall be evaluated in accordance with the provisions of this chapter.

9.1.2 The scores of improvement and innovation items shall be the sum of the bonus items. When the score is greater than 100 points, it shall be taken as 100 points.

9.2 Bonus points

9.2.1 Take measures to further reduce the energy consumption of building heating and air conditioning system. The total assessment score is 30 points. The energy consumption of the heating and air-conditioning system of the building is reduced by 40% compared with the current national energy-saving standards for buildings: 10 points. For each reduction of 10%: another 5 points, at most 30 points.

9.2.2 Adopt the architectural style design suitable for regional characteristics. Inherit the regional architectural culture according to local conditions. The assessment score is 20 points.

9.2.3 Reasonably select abandoned sites for construction; or make full use of old buildings that are still usable. The assessment score is 8 points.

9.2.4 The green capacity rate of the venue is not less than 3.0. The total assessment score is 5 points. It is scored based on the following rules:

1 The calculated value of the green capacity of the venue is not less than 3.0: 3 points.

2 The measured value of the green capacity of the venue is not less than 3.0: 5 points.

9.2.5 Use structural systems and building components that meet the requirements of industrialized construction. The assessment score is 10 points. It is scored based on the following rules:

1 The main structure adopts steel structure and wood structure: 10 points.

2 The main structure adopts a prefabricated concrete structure; the proportion of the concrete volume of the prefabricated parts aboveground to the total volume of concrete reaches 35%: 5 points; 50%: 10 points.

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