

(Tentative Translation)

**DRAFT CABINET ORDER PARTIALLY REVISING THE
BUILDING STANDARD LAW ENFORCEMENT ORDER**

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**Building Guidance Division,
Housing Bureau,
Ministry of Construction**

I. Provisions Related to Building Structure

CHAPTER III STRUCTURAL STRENGTH

Section 1 General Provisions

(Technical Requirements for Construction Methods)

Article 36. Technical requirements stipulated by Cabinet Order under Article 20 item (1) of the Law (excluding technical standards for building equipment) shall be as specified through this Section to Section 7-2.

2. A construction method for buildings other than buildings referred to in Article 6 paragraph 1 item (2) and item (3) of the Law shall be a construction method specified in one of the following items.

(1) A construction method that conforms to those specified from this section to section 7-2.

(2) A construction method that conforms to regulations related to durability etc. (refers to regulations specified in this Article to Article 37, Article 38 paragraphs 1, 5, and 6, Article 39 paragraph 1, Article 41, Article 49, Article 70, Article 72 (including cases where it applies mutatis mutandis in Article 79-4 and Article 80), Article 74 to Article 76 (including cases where it applies mutatis mutandis in Article 79-4 and Article 80), Article 79 (including cases where it applies mutatis mutandis in Article 79-4), Article 79-3, and Article 80-2 (limited to standards from among technical standards considered necessary for safety stipulated by the Minister of Construction that are designated by the Minister of Construction)) and whose safety has been confirmed by the critical strength calculation specified in Article 82-6 or by structural calculation specified in the proviso to Article 81 (limited those that are designated by the Minister of Construction as those that have been confirmed to provide safety equal to or greater than in cases based on critical strength calculations).

(3) A construction method that conforms to regulations related to durability etc. and has been approved by the Minister of Construction as a construction method whose safety has been confirmed by structural calculations that conform to requirements stipulated by the Minister of Construction under the provisions of Article 81-2.

3. A construction method for a building referred to in Article 6 paragraph 1 item (2) or (3) of the Law (excluding a building with a height in excess of 60 meters (referred to as high-rise building in the following paragraph, Article 81, and Article 81-2)) shall be a construction method specified in one of the following items.

(1) A construction method that conforms to the provisions from this Section to Section 7-2 and whose safety has been confirmed by allowable unit stress calculations specified in Article 82 or by structural calculations that specified in the proviso to Article 81.

(2) A construction method specified in item (2) or item (3) of the preceding paragraph.

4. A construction method for a high-rise building shall conform to regulations related to durability etc., and shall be a construction method that has been approved by the Minister of Construction as a method whose safety has been confirmed by structural calculations specified by the Minister of Construction under the provisions of Article 81-2.

(Fundamental Principles of Structural Strength)

Article 36-2. Omitted.

(Foundations)

Article 38. Omitted.

2. Different kinds of foundations shall not be used for the same building.

3. The construction of the foundation of a building shall be a construction method specified by the Minister of Construction accounting for the construction and form of the building and the condition of the ground. In this case, the bottom of foundations (or the tip of foundation piles if they are used) of buildings which have a height exceeding 13 m or a total floor area exceeding 3,000 sq m shall reach down to stable soil if the loads acting upon the building concerned exceeds 10 t/sq m of floor area when measured on the lowest floor of the building.

4. The provisions in the preceding two paragraphs shall not apply in a case where the structural safety of the foundation of the building has been confirmed by structural calculations specified by the Minister of Construction.

5.-6. Omitted.

(Anchoring of Roofing Materials, etc.)

Article 39. Omitted.

2. The construction of roofing materials, exterior materials and curtain walls to be fixed to the outside of buildings shall conform to a construction method specified by the Minister of Construction as a method that is structurally safe.

(Sills and Foundations)

Article 42. The base of columns constituting principal parts necessary for structural strength and used on the lowest floor shall be placed on sills. Provided, that this shall not apply in cases where the columns concerned are firmly fastened to the foundation or where the feet of columns in single-story buildings are fixed with each other by “ashigatame” girths (limited to cases where the columns concerned are firmly fastened to a foundation within the areas designated by the Designated Administrative Agency by regulations as areas where the ground is soft, in accordance with the standards established by the Minister of Construction).

2. Sills shall be firmly fastened to a foundation. Provided, that this shall not apply to single-story buildings with total floor area of 50 sq m or less within the areas other than areas designated by the provisions in the proviso to the preceding paragraph.

(Smallest Width of Columns)

Article 43. The ratio of the smallest width of columns constituting principal parts necessary for structural strength in the span direction or in the ridge direction in relation to the vertical

distance between horizontal members in each direction as necessary for structural strength such as sills, “ashigatame,” girths, beams, girders, etc. which are connected with the said columns shall be not less than the ratio shown in the following table. Provided, that this shall not apply in cases where the calculation specified by the Minister of Construction confirms that the smallest width concerned is safe from the viewpoint of structural strength.

Columns	Buildings		
	(1) Buildings of “dozozukuri” construction or other similar buildings with especially heavy walls	(2) Buildings other than those in (1) whose roofs are covered with light materials such as metal sheets, stone plates, asbestos sheet, wooden boards or the like	(3) Buildings other than those in (1) and (2)
Columns placed at intervals of 10 m or more in the span and ridge directions or columns in buildings for use as schools, day nurseries, theaters, movie theaters, entertainment halls, grand-stands, public halls, assembly halls, stores engaged in commodity sales (excluding those with an aggregate of floor areas of 10 sq m or less) or public bathhouses			
Columns in the uppermost story or columns of single- story buildings	1/22	1/30	1/25
Columns in other stories	1/20	1/25	1/22
Columns other than the above			
Columns in the uppermost story or columns of single- story buildings	1/25	1/33	1/30
Columns in other stories	1/22	1/30	1/28

2. The smallest width of columns in the span and ridge directions constituting principal parts necessary for the structural strength of the first floors of buildings which have more than two stories excluding basement levels shall not be less than 13.5 cm. Provided, that this shall not apply in cases where the columns concerned are firmly fastened to sills or foundations as well as to beams, ridges and/or other horizontal members by bolts or other similar methods, and where structural safety has been confirmed through structural calculation specified by the Minister of Construction.

3.-6. Omitted.

(Braces)

Article 45. Braces acting as tension members shall be made of timber 1.5 cm or more in thickness and 9 cm or more in width or of reinforcing bars 9 mm or more in diameter.

2. Braces acting as compression members shall be made of timber 3 cm or more in thickness and 9 cm or more in width.

3.- 4. Omitted.

(Frames, etc. Necessary for Structural Strength)

Article 46. In buildings whose walls, columns and horizontal members constituting principal parts necessary for structural strength are made of wood, frames having either walls or braces shall be properly arranged on each floor in both the span and ridge directions so that the said buildings will be safe against horizontal force in any direction.

2. The provision of the preceding paragraph shall not apply to buildings or structural building parts of wooden construction coming under any of the following items:

(1) Buildings or structural building parts which conform to (a) to (c) below:

(a) The quality of glued laminated timber and other timber used as columns and horizontal members (excluding studs, small beams and other similar members; the same in this item) constituting principal parts necessary for structural strength shall conform to standards established by the Minister of Construction concerning the strength and durability of the columns and horizontal members concerned.

(b) The feet of columns constituting principal parts necessary for structural strength shall be firmly fastened to sills firmly fastened to a monolithic continuous foundation constructed of reinforced concrete, or be firmly fastened to foundation constructed of reinforced concrete.

(c) In addition to the above-mentioned items (a) and (b), structural safety has been confirmed through structural calculation in compliance with the standards established by the Minister of Construction.

(2) Buildings with knee braces (limited to those fixed to columns which are reinforced with fish plate, etc.), stay posts and buttress walls which is satisfactory from the viewpoint of structural strength.

3. Corners of floor framing and tie beam framing shall be provided with horizontal angle braces and roof trusses with bracings. Provided, that this shall not apply in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction.

4. Frames having either walls or braces to be arranged in both the span and ridge directions on each floor under paragraph 1 that are provided in wooden buildings with two or more stories or with a total floor area exceeding 50 sq m shall be installed based on requirements specified by the Minister of Construction so that the sum of the values obtained by multiplying the length of each frame in the same direction by one of the figures shown in the column of “Multiplier” of the following Table 1 according to the classification of frames as shown in the column of “Type of frame” of the said table, shall equal or exceed, in each direction, the value obtained by multiplying the floor area of the said floor (in a case where a storeroom is constructed on the said floor, the attic space or above the ceiling of the story above the said floor, or other similar space, the floor area obtained by adding a floor area specified by the Minister of Construction according to the floor area and the height of the said storeroom to the floor area of the said floor) by one of the figures shown in Table 2 (in areas designated by the Designated Administrative Agency under Article 88 paragraph 2, the figures will be 1.5 times those in Table 2) and also the value obtained by multiplying the plumb measure size (which is the vertically projected area in the span or ridge direction; hereinafter the same) of the said floor (including higher floors if any) minus the plumb measure size of the portion of the said floor up to a height of 1.35 m from the floor level, by one of the figures shown in Table 3.

Table 1

	Type of frame	Multiplier
(1)	Frames with earth-plaster walls or frames with walls with wooden lath or the like nailed to one side of columns and studs	0.5
(2)	Frames with walls with wooden lath or the like nailed to both sides of columns and studs	1
	Frames with braces of timber 1.5 cm <u>or more</u> in thickness and 9 cm <u>or more</u> in width or with steel bar braces 9 mm <u>or more</u> in diameter	
(3)	Frames with braces of timber 3 cm <u>or more</u> in thickness and 9 cm <u>or more</u> in width	1.5
(4)	Frames with braces of timber 4.5 cm <u>or more</u> in thickness and 9 cm <u>or more</u> in width	2
(5)	Frames with braces of timber 9 cm <u>or more</u> square	3
(6)	Frames with “X” braces shown in any of (2) through (4)	Two times each value of (2) through (4)
(7)	Frames with “X” braces shown in (5)	5
(8)	<u>Other frames approved by the Minister of Construction or frames using a construction method specified by the Minister of Construction</u> as having such strength as equal or superior to that of the frames shown in one of (1) through (7)	A value to be specified by the Minister of Construction within the range between 0.5 and 5
(9)	Frames with walls shown in item (1) or (2) and braces shown in one of (2) through (6)	The sum of the value of (1) or (2) and that of one of (2) through (6)

Table 2

	Buildings	
	Buildings specified in (1) or (3) of the table of Article 43 paragraph 1	Buildings specified in (2) of the table of Article 43 paragraph 1
Multiplier for the floor area of each floor (unit: cm/sq m)		
Single-story buildings	15	11
First floor of two-story buildings	33	29
Second floor of two-story buildings	21	15
First floor of three-story buildings	50	46
Second floor of three-story buildings	39	34
Third floor of three-story buildings	24	18

For this table, basement levels shall not be included in counting the number of stories.

Table 3

Areas	Multiplier for plumb measures size (unit: cm/sq m)
(1) Areas designated by the Designated Administrative Agency by regulations as strong wind areas, based on past data on wind	A value to be determined by the Designated Administrative Agency by regulations based on the wind conditions in the region concerned within a range exceeding 50 and not more than 75
(2) Areas other than the above	50

(Joints/Connections Constituting Principal Parts Necessary for Structural Strength)

Article 47. Joints/connections constituting principal parts necessary for structural strength shall be firmly fastened in such a way as to properly transmit the full existing stress of the said parts by using bolts, cramps, cotters or other construction methods specified by the Minister of Construction. In this case, if excessive depth of horizontal members, rigid connection of steel horizontal members to columns or other factors might generate such local stress within the said columns as is detrimental to structural strength, the columns concerned shall be reinforced with fish plates or other materials.

2. Omitted.

(Wooden School Buildings)

Article 48. School buildings whose walls, columns and horizontal members are made of wood shall comply with the provisions as mentioned in the following:

(1) Omitted.

(2) If the ridge length exceeds 12 m, continuous partition walls with braces as mentioned in paragraph (5) of Table 1 of Article 46 paragraph 4 shall be provided at an interval of 12 m or less in the ridge direction. Provided, that this shall not apply in cases where stay posts or buttress walls are provided at proper intervals and it has been confirmed that these are safe from the viewpoint of structural strength by structural calculations specified by the Minister

of Construction.

- (3) Omitted.
 - (4) Columns constituting principal parts necessary for structural strength shall be 13.5 cm or more square (those columns on the first floor in two-story buildings which are located at an interval of 4 m or more in the span or ridge direction shall be either coupled columns consisting of 13.5 cm or more square columns or columns of 15 cm or more square).
2. The provisions of the preceding paragraph shall not apply to school buildings coming under any one of the following items:

- (1) School buildings which conform to the standards mentioned in (a) through (c) of Article 46 paragraph 2 item (1).
- (2) Omitted.

(Scope of Application)

Article 51. The provisions of this Section shall apply to buildings of masonry construction such as brick construction, stone construction, concrete block construction and other masonry construction, (excluding reinforced concrete block construction; the same in this paragraph and in paragraph 4) and to the structural parts of masonry construction in buildings of masonry construction combined with wooden or other construction. Provided, that only Article 59-2 among the provisions in this section shall apply to parts reinforced with steel frames or steel reinforced concrete and which have been confirmed to be safe through structural calculation specified by the Minister of Construction.

2. Omitted.
3. Partition walls which are not important for structural strength and have a height of 2 m or less shall be subject only to Article 52 and Article 55 paragraph 5 in applying the provisions of this Section.

Article 53. Deleted.

(Masonry Construction Requiring Reinforcement)

Article 59-2. A building higher than 13 meters or with eaves higher than 9 meters shall be reinforced with steel bars, steel frames, or with reinforced concrete constructed with a construction method specified by the Minister of Construction.

Article 62-3. Deleted.

(Bearing Walls)

Article 62-4. Omitted.

2.- 3. Omitted.

4. Bearing walls of reinforced concrete block construction shall be provided with reinforcing bars of 12 mm or more in diameter vertically at the end and the corner, and shall be provided with reinforcing bars of 9 mm or more in diameter vertically and horizontally at intervals of 80 cm or

more.

5-6. Omitted.

(Fences)

Article 62-8. Fences of reinforced concrete block construction shall be as described in each of the following items (excluding items (5) and (7) for fences 1.2 m or less in height). Provided, that this shall not apply in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction:

(1)-(2) Omitted.

(3) The walls shall be provided with reinforcing bars with a diameter of 9 mm or more which are arranged horizontally at the top and foundation of the wall and vertically at the end and corner thereof.

(4)-(7) Omitted.

(Materials)

Article 64. Materials used to make principal parts necessary for structural strength of steel frame buildings shall be carbon steel or stainless steel (hereafter in this section, “steel materials”) or cast iron.

2. Cast iron shall not be used in parts dependant on stress other than compressive stress or contact stress.

(Feet of Columns)

Article 66. The feet of columns constituting principal parts necessary for structural strength shall be firmly fastened to the foundation by anchor bolts and by other construction method conforming to requirements specified by the Minister of Construction. Provided, that this shall not apply in cases where pin connection is used.

(Joining)

Article 67. Steel shapes constituting principal parts necessary for structural strength shall, in cases where the steel material joined is carbon steel, be joined by high strength bolting, welding or riveting (double plate riveting when riveting joints/connections constituting principal parts necessary for structural strength), and in cases where the steel material joined is stainless steel, high strength bolting or welding. Provided, that in the case of buildings whose eaves are 9 m or less in height and whose span is 13 m or less (excluding buildings with a total floor area exceeding 3,000 sq m), bolting shall be permitted as long as the bolted parts are embedded in concrete, nuts are fixed by welding, or lock nuts are used so that bolts will not be loosened or as long as other deterrent measures are taken whose effectiveness is equal or superior to the aforementioned measures.

2. Joints/connections constituting principal parts necessary for structural strength shall be constructed by a construction method specified by the Minister of Construction such that the existing stress at the parts concerned may be transmitted. In this case, when no tensile stress is made to exist by making the end of columns perfectly planed and by making the contact of joints/connections tight, the joints/connections may be deemed of such construction as a maximum

1/4 (1/2 at the foot of columns) of the compressive force and the bending moment at that point is transmitted through the surface of contact.

(Provision of Diagonal Members, Walls, etc.)

Article 69. Upright framing, floor framing and tie beam framing shall be provided, in a well balanced manner, with shaped steel, steel bars, or structural use cable as diagonal members, or with walls, roof slabs or floor slabs of reinforced concrete construction, except in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction so that it is safe from horizontal forces in all directions.

(Fire Preventive Coverings for Columns)

Article 70. Regarding buildings having three or more stories excluding basement levels (excluding buildings satisfying the requirements in Article 2, item (9-2)(a) of the Law and buildings coming under the provisions of Article 2 item (9-3)(a) of the Law), in a case specified by the Minister of Construction as one where there is a danger of easy collapse of the whole building due to deterioration in strength resulting from heating only one column, the said column shall have a construction specified by the Minister of Construction as that which when exposed to heat equivalent to the heat of a normal fire will neither be deformed, melted, fail, nor suffer other damage detrimental to structural strength for 30 minutes after the beginning of the heating, or a construction method approved by the Minister of Construction.

(Splice and Development of Reinforcing Bars)

Article 73. Omitted.

2. On longitudinal bars or reinforcing bars for bearing walls (referred to in this paragraph as “longitudinal bars, etc.”), the length of lap shall, in a case where the splice is installed on the part of the structural member with the smallest tensile force, be 25 times or more of the diameter of longitudinal bars, etc. (in the case of splicing longitudinal bars, etc. of different diameters, the smaller diameter; the same in this Article), and in a case where the splice is installed on a part other than a part with the smallest tensile force, 40 times or more of the diameter of longitudinal bars, etc. Provided, that this shall not apply if the splice is formed by a construction method specified by the Ministry of Construction.

3.-4 Omitted.

5. The provisions of each preceding paragraph shall not apply in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction.

(Strength of Concrete)

Article 74. The strength of concrete to be used for reinforced concrete construction shall be as specified in the following items:

(1) The compressive strength of concrete at the age of 28 days shall be 12 Newton/1 mm² (9 Newton in the case of using light weight aggregate) or more.

(2) Omitted.

2. The strength of concrete specified in the preceding paragraph shall be determined by a strength test designated by the Minister of Construction.

3. Omitted.

(Construction of Columns)

Article 77. Columns constituting principal parts necessary for structural strength shall be constructed as specified in the following. Provided, that the provisions of items (2) through (5) shall not apply in cases where structural safety has been confirmed through structural calculation specified by the Ministry of Construction:

(1)-(5) Omitted.

(Construction of Floor Slabs)

Article 77-2. Floor slabs constituting principal parts necessary for structural strength shall be constructed as described in the following. Provided, that this shall not apply in cases where it has been confirmed through structural calculation stipulated in Article 82 item (4) that there is no problem of vibration or deformation adversely affecting the use of the building.

(1)-(2) Omitted.

2. Those floor slabs as described in the preceding paragraph which are made of precast reinforced concrete shall be the construction specified in the following items in addition to the provisions of the said paragraph. Provided, that this shall not apply in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction.

(1)-(2) Omitted.

(Construction of Beams)

Article 78. Beams constituting principal parts necessary for structural strength shall be double reinforced beams, and shall have stirrups at intervals not exceeding $\frac{3}{4}$ of the span of the said beams (not exceeding 30 cm for wall girders). Provided, that for the joints of beams which are made of precast reinforced concrete and are each composed of two or more members, this shall not apply in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction.

(Bearing Walls)

Article 78-2. Bearing walls shall be constructed as specified in each of the following items:

(1)-(2) Omitted.

(3) Bearing walls shall be provided with horizontal and vertical reinforcing bars with a diameter of 9 mm or more at an interval of 30 cm or less (45 cm or less in the case of double reinforcement) except in cases where structural safety has been confirmed through structural calculation specified by the Minister of Construction. Provided, that the interval may be

extended up to 35 cm (50 cm in the case of double reinforcement) for single-story buildings.

(4) Omitted.

2. Omitted.

(Depth of Concrete Covering for Embedded Bars)

Article 79. Omitted.

2. The provisions of the preceding paragraph shall not apply to a member made of precast reinforced concrete that has a construction specified by the Minister of Construction.

(Depth of Concrete Covering for Embedded Steel Frames)

Article 79-3. Omitted.

2. The provisions of the preceding paragraph shall not apply to a member made of precast steel framed reinforced concrete that has a construction specified by the Minister of Construction.

(Application)

Article 81. Structural calculations specified in one of the following items for buildings as mentioned in Article 20 item (2) of the Law (excluding high-rise buildings) shall be made according to any of the following items. Provided, that this shall not apply in cases where structural calculation is made by a method which is specified by the Minister of Construction as equal or superior to these structural calculations in confirming the safety of buildings.

(1) Allowable unit stress etc. calculation

(2) Critical strength calculation.

2. Omitted.

(Special Rules Regarding High Rise Buildings)

Article 81-2. Structural calculation for high-rise buildings shall be made by those methods which are specified by the Minister of Construction as being valid in confirming the structural safety of the building, by continuously clarifying the force and deformation produced in each part of the building by loads and external forces according to the construction method of the building and the properties of its vibration.

Clause 1-2 Allowable Unit Stress Calculation Etc.

(Allowable Unit Stress Calculation, etc.)

Article 82. Allowable unit stress calculation etc. as specified in Article 81 item (1) refers to a structural calculation that conforms to each of the following items and to the provisions of Article 82-2 to Article 82-5:

(1) Such forces acting upon principal parts of buildings necessary for structural strength as

caused by loads and external forces as specified in Clause 2 shall be calculated.

- (2) Unit stresses due to sustained and temporary loads acting upon the sections of principal parts necessary for structural strength as mentioned in the preceding item shall be calculated by the formula shown in the following table.

<u>Kinds of force</u>	<u>Possible conditions Regarding loads and External forces</u>	<u>General Cases</u>	<u>In heavy snow areas designated by the Designated Administrative Agency under the proviso to Article 86 paragraph 2</u>	<u>Remarks</u>
<u>Force due to sustained loads</u>	<u>Normal time</u>	<u>G+P</u>	<u>G+P</u>	
	<u>Snow season</u>		<u>G+P+0.7S</u>	
	<u>Snow season</u>	<u>G+P+S</u>	<u>G+P+S</u>	
<u>Stress due to temporary loads</u>	Storm	G+P+W	G+P+W	Safety in case of overturning of buildings or pulling out of columns, P shall be a value obtained by reducing the live load according to the actual conditions of the building concerned
			G+P+0.35S+W	
	Earthquake	G+P+K	G+P+0.35S+K	

In this table, G, P, S, W and K represent the following forces (forces combined of axial stress, bending moment, shearing stress and others):

- G Forces produced by dead load as specified in Article 84
- P Forces produced by live load as specified in Article 85
- S Forces produced by snow load as specified in Article 86
- W Forces produced by wind pressure as specified in Article 87
- K Forces produced by seismic force as specified in Article 88

- (3) It shall be confirmed that unit stresses due to sustained and temporary loads calculated under the preceding item for each principal part necessary for structural strength in item (1) do not exceed sustained forces or temporary forces as specified in Clause 3.
- (4) In cases specified by the Minister of Construction, it shall be confirmed by a method specified by the Minister of Construction, that any deformation or vibration of structural members constituting principal parts necessary for structural strength will not have adverse effects on the use of the building concerned.

(Relative Story Displacement Angle)

Article 82-2. Regarding buildings specified by the Minister of Construction (referred to in this Clause as “specified buildings”), it shall be confirmed that, in addition to complying with the provisions of each item of the preceding Article, the ratio of horizontal relative story displacement caused to each aboveground story of a specified building by such seismic force as specified in

Article 88 paragraph 1 (referred to in this Clause as “seismic force”) to the height of the story concerned (such ratio to be referred to in the next Article and Article 109-2 as “relative story displacement angle”) is not greater than 1/200 (1/120 in cases where such deformation of principal parts of a specified building necessary for structural strength as caused by seismic force is not likely to lead to considerable damage of any part of the said building).

(Stiffness Ratio, Eccentricity Ratio, etc.)

Article 82-3. Regarding specified buildings which do not exceed 31 m in height, it shall be confirmed that all the aboveground parts of the specified building concerned conform with each of the following items and structural calculations recognized and specified by the Minister of Construction as necessary for safety from earthquakes according to a construction method for specified buildings shall be performed, in addition to the provisions of the items of Article 82 and the preceding Article. Provided, that this shall not apply in cases where structural calculation for the aboveground parts of a specified building is made according to the provisions of each item of the next Article:

(1)-(2) Omitted.

(Retained Horizontal Strength)

Article 82-4. Regarding specified buildings which exceed 31 m in height, it shall be confirmed that the strength against horizontal forces in each story calculated according to the provisions of item 1 (referred to as the “retained horizontal strength” in this article and Article 82-6) of all the aboveground parts of the specified building concerned is equal to or greater than the retained horizontal strength required as calculated according to the provisions in item (2) in addition to the provisions of the items in Article 82 and of Article 82-2:

- (1) The retained horizontal strength shall be calculated based on material strength as specified in Clause 4 .
- (2) A required value of retained horizontal strength of each story against seismic force shall be calculated with the following formula.

$$Q_{un} = D_s F_{es} Q_{ud}$$

where,

Q_{un} : Required value of retained horizontal strength of each story (in kilo-Newtons)

D_s : A value representing structural characteristics of each story specified by the Minister of Construction based on the construction of principal parts necessary for structural strength of specified buildings vibration and ductility of each story

F_{es} : A value representing form characteristics of each story to be obtained with a calculation method as specified by the Minister of Construction according to stiffness ratio and eccentricity ratio of each story

Q_{ud} : Horizontal force acting upon each story due to seismic force (in kilo-Newtons)

(Structural Calculations for Roofing Material, Etc.)

Article 82-5 It shall be confirmed that roofing materials, exterior materials, curtain walls to be fixed to the outside of buildings provide structural safety from wind pressure based on structural calculations specified by the Minister of Construction.

Clause 1-3 Critical Strength Calculation

(Critical Strength Calculations)

Article 82-6 Critical strength calculations specified by the provisions of Article 81 item (2) shall refer to structural calculations specified as follows.

(1) Except during an earthquake, it shall conform to the provisions from Article 82 item (1) to item (3) (excluding parts related to earthquakes).

(2) The forces generated in principal parts necessary for structural strength of a building during a snow period or strong winds shall be calculated by the formula shown in the following table and it shall be confirmed that the forces generated in the said principal parts necessary for structural strength do not exceed the strength of the said principal parts necessary for structural strength calculated according to the material strengths based on the provisions of Clause 4.

<u>Hypothetical state of the loads and external forces</u>	<u>Ordinary case</u>	<u>In heavy snow areas designated by the Designated Administrative Agency based on the provisions of the proviso to Article 86 paragraph 2</u>	<u>Remarks</u>
<u>Snow period</u>	<u>$G+P+1.4S$</u>	<u>$G+P+1.4S$</u>	
<u>Storm</u>	<u>$G+P+1.6W$</u>	<u>$G+P+1.6W$ $G+P+0.35S +1.6W$</u>	<u>When the overturning of a building, pull-out of a column, etc. is studied, P shall be based on a value obtained by reducing the live load according to the actual stage of the building.</u>
<u>In this table, G, P, S, and W represent the following forces (axial force, bending moment, shearing force and others):</u>			
<u>G Forces produced by dead load as specified in Article 84</u> <u>P Forces produced by live load as specified in Article 85</u> <u>S Forces produced by snow load as specified in Article 86</u> <u>W Forces produced by wind pressure as specified in Article 87</u>			

(3) The horizontal forces acting on each above-ground story of a building and the relative story displacement generated in each story of the building by the acceleration of an earthquake shall be calculated as specified in the following (a) to (d), it shall be confirmed that the said horizontal forces do not exceed the critical damage strength (refers to the strength against horizontal forces in

each story of the building in a case where the unit stress generated in the cross-sections of principal parts necessary for structural strength in each story of the building reaches the allowable unit stress against the temporary force generated based on the provisions in Clause 3; same in this item), and it shall be confirmed that the relative story displacement does not exceed 1/200 (In a case where there is no danger of seismic force causing deformation of a principal part necessary for structural strength, resulting in conspicuous damage occurring in a part of the building, 1/120).

a) The horizontal relative story displacement generated in a story when the story is withstanding horizontal force equivalent to the critical damage strength and other forces acting on it (referred to as “critical damage displacement” in the remainder of this item) shall be calculated.

b) The natural period of a building when displacement equivalent to the critical damage displacement calculated in a) is generated in any story of the building (referred to as “critical damage natural period” in this item and item (7)) shall be calculated by a method specified by the Minister of Construction.

c) The seismic force acting on a story of a building during an earthquake shall be calculated as the aggregate of the forces generated horizontally in the said story and higher stories calculated by the formula shown in the following table according to the critical damage natural period.

<u>Td < 0.16 case</u>	<u>Pdi = (64 + 600 Td) mi Bdi Z Gs</u>
<u>0.16 <= Td < 0.64 case</u>	<u>Pdi = 160 mi Bdi Z Gs</u>
<u>0.64 <= Td < 5.00 case</u>	<u>Pdi = (102.4 /Td) mi Bdi Z Gs</u>
<u>In this table, Td, Pdi, mi, Bdi, Z, and Gs represent the following values.</u>	
<u>Td Critical damage natural period of the building (unit: seconds)</u>	
<u>Pdi Forces acting horizontally on each story (units: kilo-Newtons)</u>	
<u>mi Mass of each story (obtained by dividing the sum of the dead load and the live load (plus the snow load in heavy snow areas designated by the Designated Administrative Agency under the provisions of the proviso to Article 86 paragraph 2) of the story by the gravity acceleration) (unit: tons)</u>	
<u>Bdi A value that represents the distribution of the acceleration generated in each story of the building; it is calculated in accordance with standards specified by the Minister of Construction according to its critical damage natural period</u>	
<u>Z Value of Z which is stipulated in Article 86 paragraph 1</u>	
<u>Gs A value that represents the amplification rate of the acceleration caused by the surface ground; it is calculated by a method specified by the Minister of Construction according to the category of surface ground</u>	

d) The horizontal relative story displacement generated in each story when the story is withstanding horizontal force and other forces acting on it calculated in c) shall be calculated.

(4) The unit stress generated in the cross section of principal parts necessary for structural strength of the below-ground parts of a building by the seismic force stipulated in Article 88 paragraph 4 shall be calculated based on the provisions of Article 82 item (1) and item (2), and it shall be confirmed that these do not exceed the allowable unit stresses under the temporary forces in accordance with the provisions of Clause 3.

(5) The horizontal force acting on each story of a building under the effects of acceleration generated by an earthquake shall be calculated by methods stipulated in a) to c) below and it shall be confirmed that the said horizontal force does not exceed the retained horizontal strength.

- a) The maximum horizontal relative story displacement generated in a story when the story is withstanding horizontal force equivalent to the retained horizontal strength and other forces acting on it (referred to as “critical safety displacement” in the remainder of this item) shall be calculated by a method specified by the Minister of Construction.
- b) The natural period of a building when displacement equivalent to the critical safety displacement calculated in a) is generated in any story of the building (referred to as “critical safety natural period” in the remainder of this item) shall be calculated by a method specified by the Minister of Construction.
- c) The seismic force acting on a story of a building during an earthquake shall be calculated as the aggregate of the forces generated horizontally in the said story and higher stories calculated by the formula shown in the following table according to the critical safety natural period.

<u>Ts < 0.16 case</u>	<u>Psi = (320 + 3,000 Ts) mi Bsi Fh Z Gs</u>
<u>0.16 <= Ts < 0.64 case</u>	<u>Psi = 800 mi Bsi Fh Z Gs</u>
<u>0.64 <= Ts < 5.00 case</u>	<u>Psi = (512/ Ts) mi Bsi Fh Z Gs</u>
<u>In this table, Ts, Psi, mi, Bsi, Fh, Z, and Gs represent the following values.</u>	
<u>Ts Critical safety natural period of the building (unit: seconds)</u>	
<u>Psi Forces acting horizontally on each story (units: kilo-Newtons)</u>	
<u>mi Value of mi as stipulated in item (3)</u>	
<u>Bsi A value that represents the distribution of the acceleration generated in each story of the building; it is calculated in accordance with standards specified by the Minister of Construction according to the properties of the vibration of the critical safety natural period</u>	
<u>Fh A value that represents the abatement rate of the acceleration caused by the damping of the vibration of the critical safety natural period, it is calculated in accordance with standards specified by the Minister of Construction.</u>	
<u>Z Value of Z which is stipulated in Article 88 paragraph 1</u>	
<u>Gs Value of Gs specified in item (3)</u>	

(6) It shall be in accordance with the provisions of Article 82 item (4).

(7) It shall be confirmed that roofing materials, exterior materials and curtain walls to be fixed to the outside of buildings are safe from the viewpoint of structural strength against wind pressure, earthquakes, and other vibrations and impacts based on structural calculations specified by the Minister of Construction accounting for the acceleration generated in each story of the building according to the horizontal relative story displacement generated in each story of the building calculated in accordance with the provisions of item (3-2) and according to the critical damage natural period of the building calculated in accordance with the provisions in b) in the same item.

(Dead Loads)

Article 84. Dead load of each part of a building shall be calculated according to the actual conditions of the building concerned. Provided that the dead load of each part of a building stipulated in the following table may be calculated by multiplying the value stipulated in the weight per unit surface area column on the same table by the surface area.

Parts of Building	Kinds of the part	Weight per unit surface area (Unit: <u>Newton</u> /sq m)	Remarks
Roof		(For face of roof)	
	Clay tile roof		
	When no mud bed used	<u>640</u>	Including beds and rafters but not including purlins
	When mud bed used	<u>980</u>	
	Asbestos cement shingle roof		
	Placed directly over purlins	<u>250</u>	Not including purlins
	Other cases	<u>340</u>	Including beds and rafters but not including purlins
	Corrugated iron sheet roof		
	Placed directly over purlins	<u>50</u>	Not including purlins
	Iron sheet roof	<u>200</u>	Including beds and rafters but not including purlins
	Glass roof	<u>290</u>	Including steel frames but not including purlins
	Pressed cement tile roof	<u>440</u>	Including beds and rafters but not including purlins
Wooden purlin		(For face of roof)	
	When distance of supports of purlins is 2 m or less	<u>50</u>	
	When distance of supports of purlins is 4 m or less	<u>100</u>	
Ceiling		(For face of ceiling)	
	Common moulding and strip	<u>100</u>	
	Fiberboard, wooden board, plywood board or metal sheet	<u>150</u>	Including straps, brackets and other beds
	Cemented excelsior board	<u>200</u>	
	Cross framed moulding	<u>290</u>	
	Plaster finish	<u>390</u>	
	Mortar finish	<u>590</u>	
Floor		(For face of floor)	
	Wooden floor		
	Wooden board	<u>150</u>	Including joists
	Tatami (Japanese mat)	<u>340</u>	Including floor boards and joists
	Floor beam		
	When span is 4 m or less	<u>100</u>	
	When span is 6 m or less	<u>170</u>	
	When span is 8 m or less	<u>250</u>	
Floor		(For face of floor)	
	Finish of concrete floor		
	Wooden board	<u>200</u>	Including joists and sleepers
	Flooring block	<u>150</u>	It shall be multiplied by the thickness of the finish in centimeters
	Mortar finish, artificial stone finish and tile finish	<u>200</u>	
	Asphalt waterproof layer	<u>150</u>	It shall be multiplied by the thickness in centimeters
Wall		(For face of wall)	
	Wall frame in wooden building	<u>150</u>	Including columns, studs and braces
	Finish of wall in wooden building		
	Wood siding, lining or fiber-board finish	<u>100</u>	Including beds but not including frames
	Plaster on wooden lath	<u>340</u>	
	Mortar on metal lath	<u>640</u>	

(continued)

Parts of Building	Kinds of the part	Weight (Unit: kg/sq m) (For face of wall)	Remarks
Wall	Earth plaster wall (“komaikabe”) in wooden building	<u>830</u>	Including frames
	Finish of concrete wall		
	Plaster finish	<u>170</u>	It shall be multiplied by the thickness of the finish in centimeters
	Mortar and artificial stone finish	<u>200</u>	
Tile finish	<u>200</u>		

(Live Loads)

Article 85. Live load at each part of a building shall be calculated according to the actual conditions of the building concerned. Provided, that live loads for the floor of rooms as mentioned in the following table may be calculated by multiplying a value as shown in each column of (a), (b) or (c) of the same table by the floor surface area.

Kinds of rooms	Items to be calculated		
	(a) Structural calculation for floors (unit: <u>Newton/sq m</u>)	(b) Structural calculation for beams, columns or foundations (unit: <u>Newton/sq m</u>)	(c) Calculation of seismic force (unit: <u>Newton/sq m</u>)
(1) Habitable rooms of houses, bedrooms or sickrooms of buildings other than houses	<u>1,800</u>	<u>1,300</u>	<u>6,00</u>
(2) Offices	<u>2,900</u>	<u>1,800</u>	<u>800</u>
(3) Classrooms	<u>2,300</u>	<u>2,100</u>	<u>1,100</u>
(4) Sales area in department stores or other stores	<u>2,900</u>	<u>2,400</u>	<u>1,300</u>
(5) Seating space or meeting rooms of theaters, movie theaters, entertainment halls, grand-stands, public halls, assembly halls or other buildings for similar use			
In the case of fixed seats	<u>2,900</u>	<u>2,700</u>	<u>1,600</u>
In the case of other seats	<u>3,500</u>	<u>3,200</u>	<u>2,100</u>
(6) Automobile garages or passageways for automobiles	<u>5,400</u>	<u>3,900</u>	<u>2,000</u>
(7) Corridors, vestibules or stairs	For those connected to rooms as mentioned in (3) through (5), the value of “In the case of other seats” of (5) is to be taken.		
(8) Open space on roof or balconies	Value of (1) is to be used. Provided, that in the case of buildings for use as schools or department stores, the value of (4) is to be taken.		

2. Omitted.

3. Even if the live load for the floors of commercial warehouses calculated according to the actual conditions under paragraph 1 is less than 3,900 Newton/sq m, the value shall be deemed to be

3,900 Newton /sq m.

(Snow Loads)

Article 86. Snow loads shall be calculated by multiplying unit weight of snow by the area of horizontal projection of the roof and depth of the snow fall in the region concerned.

2. Unit weight of snow as mentioned in the preceding paragraph shall be 20 Newton/sq m or more for every centimeter of snow depth. Provided, that the Designated Administrative Agency may designate, by regulations, heavy snow areas based on the standards established by the Minister of Construction and may prescribe otherwise for such areas.

3. Depth of the snow fall as mentioned in paragraph 1 shall be values specified by the Designated Administrative Agency based on standards specified by the Minister of Construction.

4. In cases where the roof slope is less than 60° except where there are snow stoppers on the roof, snow loads on a roof may, according to its slope, take a value obtained by multiplying the snow load in paragraph 1 by one of the figures based on the following formula (or other figures specified by the Designated Administrative Agency in cases where such figures are specified by regulations in consideration of roofing materials, nature of snow, etc.). Provided, that if the slope exceeds 60°, it may be zero.

$$\mu b = \sqrt{\cos (1.5 b)}$$

In this equation, μb and b represent the following values

: gradient of the roof (unit: degrees)

μb : roof shape coefficient

5. Omitted.

6. In regions where snow accumulation on the roof is customarily removed, the depth of the snow fall may be reduced, according to the actual conditions of snow removal, to a depth of 1 m for calculation of snow load, even if the depth of the snow fall in the region concerned exceeds 1 m.

7. In cases where the depth of the snow fall is reduced in calculating snow load according to the provisions of the preceding paragraph, details of such reduction and other necessary matters shall be indicated at the doorways, principal habitable rooms or other conspicuous parts of the building concerned.

(Wind Pressure)

Article 87. Omitted.

2. Velocity pressure as mentioned in the preceding paragraph shall be calculated by the following formula.

$$q = 0.6E V_o^2$$

In this equation, q, E, and V_o shall represent the following values.

q: Velocity pressure (unit: Newton/m²)

E: Value calculated by a method specified by the Minister of Construction according to the height of the roof of the said building and the state of buildings, other structures, trees, and other objects around the said building that effect the wind velocity

V₀: A wind velocity specified by the Minister of Construction within a range from 30 m/sec to 46 m/sec according to the degree of wind damage and other wind conditions based on records of past typhoons in the said region (unit: m/sec)

3. Omitted.

4. The value of the wind force coefficient mentioned in paragraph 1 shall be a value specified by the Minister of Construction according to the shape of the section and the plane of the building or structure, unless it is determined based on wind tunnel tests.

(Seismic Force)

Article 88. The seismic force regarding aboveground parts of a building shall be calculated, according to the height of each part of the said building, as the overall seismic force acting upon the section supported by each part. The seismic force shall be determined by multiplying the total of dead load and live load at each part (snow load in addition in heavy snow areas designated by the Designated Administrative Agency under the proviso to Article 86 paragraph 2) by the seismic story shear coefficient at the height of the said part. The seismic story shear coefficient shall be calculated by the following formula.

$$C_i = Z R_t A_i C_o$$

where,

C_i : Seismic story shear coefficient of the aboveground part of a building at a given height

Z : A value to be specified by the Minister of Construction within a range between 1.0 and 0.7 according to the extent of earthquake damage, seismic activity and other seismic characteristics based on the record of earthquakes in the region concerned

R_t : A value representing vibration characteristics of buildings to be obtained by the calculation method specified by the Minister of Construction according to the natural periods in the elastic range (referred to below as the design use natural period) of buildings and kinds of ground

A_i : A value representing a vertical distribution of seismic story shear coefficients according to the vibration characteristics of buildings to be obtained by the calculation method specified by the Minister of Construction

C_o : Standard shear coefficient

2.-4 Omitted.

(Timber)

Article 89. The allowable unit stress in the direction of grain of timber shall be in accordance with the values given in the following table. Provided that when performing structural calculations for snow accumulation periods in accordance with the provisions in Article 82 item (1) to item (3), the allowable unit stress for sustained force shall be a value obtained by multiplying the said value by 1.3 and the allowable unit stress for temporary force shall be a value obtained by multiplying the said value by 0.8.

Allowable Unit Stress for Sustained Force (Unit: Newton/mm ²)				Allowable Unit Stress for Temporary Force (Unit: Newton/mm ²)			
Compression	Tension	Bending	Shear	Compression	Tension	Bending	Shear
$\frac{1.1 F_c}{3}$	$\frac{1.1 F_t}{3}$	$\frac{1.1 F_b}{3}$	$\frac{1.1 F_s}{3}$	$\frac{2 F_c}{3}$	$\frac{2 F_t}{3}$	$\frac{2 F_b}{3}$	$\frac{2 F_s}{3}$

In this table, F_c, F_t, F_b, and F_s represent the standard strengths for compression, tension, bending, and shearing specified by the Minister of Construction according to the type and quality of the wood (unit: Newton/mm²)

2.-3. Omitted.

(Steel, etc.)

Article 90. The allowable unit stress for steel etc. shall be in accordance with the values given in the following Table 1 or 2.

Table 1

Kinds of steel	Allowable unit stress							
	Allowable unit stress for sustained forces (Unit: <u>Newton/sq. mm</u>)			Allowable unit stress for temporary forces (unit: <u>Newton/sq. mm</u>)				
	Compressio	Tension	Bending	Shear	Compression	Tension	Bending	Shear
<u>Carbon Steel</u>	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5\sqrt{3}}$				
<u>Bolts</u>								
<u>Black</u>		$\frac{F}{1.5}$						
<u>Finished</u>		$\frac{F}{1.5}$		$\frac{F}{2}$				
<u>Structural Cable</u>		$\frac{F}{1.5}$						
<u>Rivet steel</u>		$\frac{F}{1.5}$		$\frac{F}{2}$				
<u>Cast steel</u>	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5\sqrt{3}}$				

1.5 times the values of allowable unit stress for compression, tension, bending or shear for sustained forces, respectively.

In this table, F shall represent a value of standard strength (unit: Newton/sq. mm) to be specified by the Minister of Construction according to the kinds and quality of steel, etc.

Table 1

Kinds of steel	Allowable unit stress							
	Allowable unit stress for sustained forces (unit: <u>Newton/sq mm</u>)			Allowable unit stress for temporary forces (unit: <u>Newton/sq mm</u>)				
	Compression	Tension	Bending	Shear	Compression	Tension	Bending	Shear
<u>Stainle ss Steel</u>	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5\sqrt{3}}$				
<u>Bolts</u>		$\frac{F}{1.5}$		$\frac{F}{1.5\sqrt{3}}$				
<u>Structural cable</u>		$\frac{F}{1.5}$						
<u>Cast steel</u>	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5\sqrt{3}}$				
<u>Cast iron</u>	$\frac{F}{1.5}$							

1.5 times the values of allowable unit stress for compression, tension, bending or shear for sustained forces, respectively.

In this table, F shall represent a value of standard strength (unit: Newton/sq. mm) to be specified by the Minister of Construction according to the kinds and quality of steel, etc.

Table 2

Kinds of steel	Allowable unit stress					
	Allowable unit stress for sustained forces (unit: $\frac{\text{Newton}}{\text{sq. mm}}$)			Allowable unit stress for temporary forces (unit: $\frac{\text{Newton}}{\text{sq. mm}}$)		
	Tension		When used for reinforcement for shearing	Tension		When used for reinforcement for shearing
Compression	When not used for reinforcement for shearing	Compression		When not used for reinforcement for shearing		
Round bar	$\frac{F}{1.5}$ (to be regarded as <u>155</u> in excess thereof)	$\frac{F}{1.5}$	$\frac{F}{1.5}$ (to be regarded as <u>195</u> in excess thereof)	F	F	F (to be regarded as <u>295</u> in excess thereof)
Deformed bar	$\frac{F}{1.5}$ (to be regarded as <u>215</u> in excess thereof)	$\frac{F}{1.5}$	$\frac{F}{1.5}$ (to be regarded as <u>195</u> in excess thereof)	F	F	F (to be regarded as <u>390</u> in excess thereof)
Welded wire netting with a wire diameter of 4 mm or more	-	$\frac{F}{1.5}$	$\frac{F}{1.5}$ (to be regarded as <u>195</u> in excess thereof)	-	F	F (limited to cases where the netting is used for floor slabs)

In this table, F shall represent a standard strength as specified in Table 1.

Article 91. The allowable unit stress for concrete shall be in accordance with the values given in the following table. Provided, that the allowable unit stress of bonds formed with deformed steel may, in a case where the Minister of Construction has separately specified values according to the type and quality of the deformed steel, be based on the said values.

Allowable unit stress for sustained forces (unit: Newton/sq. mm)				Allowable unit stress for temporary forces (unit: Newton/sq. mm)			
Compression	Tension	Shear	Bond	Compression	Tension	Shear	Bond
$\frac{F}{3}$	$\frac{F}{30}$ (If the Minister of Construction has specified a different value for concrete whose value of F exceeds 21, that specified value)		$\frac{0.7}{0.6}$ when using light weight aggregate)	2 times the values of allowable unit stress for compression, tension, shear or bond for sustained forces, respectively. $\frac{F}{30}$ (If the Minister of Construction has specified different tension and shear values for concrete whose F exceeds 21, that specified value)			

In this table, F shall represent a standard concrete strength (unit: Newton/sq. mm)

2. Omitted.

(Welding)

Article 92. The allowable unit stress at throat sections of welded joints shall be in accordance with the values given in the following table.

Type of joints	Allowable unit stress for <u>sustained forces</u> (unit: <u>Newton/sq.mm</u>)				Allowable unit stress for <u>temporary forces</u> (unit: <u>Newton/sq.mm</u>)			
	Compression	Tension	Bending	Shear	Compression	Tension	Bending	Shear
Butt	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5}$	$\frac{F}{1.5\sqrt{3}}$				
Other than butt		$\frac{F}{1.5\sqrt{3}}$	$\frac{F}{1.5\sqrt{3}}$	$\frac{F}{1.5\sqrt{3}}$				

1.5 times the values of allowable unit stress for compression, tension, bending or shear for sustained forces, respectively

In this table, F shall represent a value of standard strength (unit: Newton/sq.mm) of welded parts, to be specified by the Minister of Construction according to the kinds and quality of steel to be welded.

(High Strength Bolting)

Article 92-2. The allowable unit shearing stress for the joints of high strength friction bolting at the axial sections of the high strength bolts concerned shall be in accordance with the values given in the following table.

Kinds of shear	Allowable unit shearing stress	
	Allowable unit shearing stress for <u>sustained forces</u> (unit: <u>Newton/sq.mm</u>)	Allowable unit shearing stress for <u>temporary forces</u> (unit: <u>Newton/sq.mm</u>)

Single shear	0.3 To	1.5 times the values of allowable unit shearing stress
Double shear	0.6 To	<u>for sustained forces</u>

In this table, To shall represent a value of standard tensile strength (unit: Newton/sq.mm) to be specified by the Minister of Construction according to the quality of the high strength bolts.

2. If both tensile and shearing forces act upon high strength bolts at the same time, the allowable unit shearing stress for the joints of high strength friction bolting at the axial sections of the high strength bolts concerned shall, notwithstanding the provisions of the preceding paragraph, be in accordance with the value to be obtained with the following formula.

$$fst = fso \left(1 - \frac{t}{To} \right)$$

where,

fst : Allowable unit shearing stress as specified in this paragraph
(unit: Newton/sq.mm)

fso : Allowable unit shearing stress as specified in the preceding paragraph
(unit: Newton/sq.mm)

t : Unit tensile stress caused by external force acting upon high strength bolts
(unit: Newton/sq.mm)

To : Specified tensile strength as described in the table of the preceding paragraph (unit: Newton/sq.mm)

(Ground and Foundation Piles)

Article 93. The allowable unit stress for ground and allowable bearing capacity of foundation piles shall be determined based on the results of soil surveying to be conducted in accordance with one of the methods specified by the Minister of Construction. Provided, that the allowable unit stress for such kinds of soil as shown in the following table may be in accordance with the values given therein.

Ground	Allowable unit stress for <u>sustained forces</u> (unit: <u>kilo-Newton/sq. m</u>)	Allowable unit stress for <u>temporary forces</u> (unit: <u>kilo-Newton/sq m</u>)
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Rock mass	<u>1,000</u>	
Cemented sand	<u>500</u>	
Mudstone	<u>300</u>	
Dense gravel layer	<u>300</u>	
Dense sandy soil	<u>200</u>	2 times the values of allowable unit stress for sustained forces
Sandy soil (<u>only that which will not liquefy during an earthquake</u>)	<u>50</u>	
Stiff clayey soil	<u>100</u>	
Clayey soil	<u>20</u>	
Stiff loam	<u>100</u>	
Loam	<u>50</u>	

(Timber)

Article 95. The material strength in the direction of grain of timber shall be in accordance with the values given in the following. Provided that when performing structural calculations for a snow accumulation period in accordance with the provisions of Article 82-6 item (2), it shall be a value obtained by multiplying the said value by 0.8.

<u>Material strength (unit: Newton/sq mm)</u>			
<u>Compression</u>	<u>Tension</u>	<u>Bending</u>	<u>Shear</u>
<u>F_c</u>	<u>F_t</u>	<u>F_b</u>	<u>F_s</u>

In this table, F_c, F_t, F_b, and F_s represent the standard strengths specified in the table in Article 89 paragraph 1.

2. Omitted.

(Steel, etc.)

Article 96. The material strength of steel, etc. shall be in accordance with the values given in the following Table 1 or 2.

Table 1

Kinds of steel	<u>Material strength (unit: Newton/sq. mm)</u>			
	<u>Compression</u>	<u>Tension</u>	<u>Bending</u>	<u>Shear</u>
Carbon Steel				
Structural steel	F	F	F	$\frac{F}{\sqrt{3}}$
High strength bolts	-	F	-	$\frac{F}{\sqrt{3}}$
Bolts				
Blank	-	F	-	-

Finished	-	F	-	$\frac{3F}{4}$ (If the Minister of Construction has specified a different value for bolts with an F value greater than 240, that value)
<u>Structural cable</u>	=	$\frac{F}{2}$	=	=
Rivet steel	-	F	-	$\frac{3F}{4}$
Cast steel	F	F	F	$\frac{F}{\sqrt{3}}$
<u>Stainless steel</u>				
<u>Structural steel</u>	$\frac{F}{2}$	$\frac{F}{2}$	$\frac{F}{2}$	$\frac{F}{2}$
<u>High strength bolts</u>	=	$\frac{F}{2}$	=	$\frac{F}{2}$
<u>Bolts</u>	=	$\frac{F}{2}$	=	$\frac{F}{2}$
<u>Structural cable</u>	=	$\frac{F}{2}$	=	=
<u>Cast steel</u>	$\frac{F}{2}$	$\frac{F}{2}$	$\frac{F}{2}$	$\frac{F}{2}$
Cast iron	F	-	-	-

In this table, F shall represent a standard strength as specified in Table 1 of Article 90.

Table 2

Kinds of steel	Material strength (unit: (unit: <u>Newton/sq.mm</u>))		
	Compression	Tension	
		When not used for reinforcement for shearing	When used for reinforcement for shearing
Round bar	F	F	F (to be regarded as <u>295</u> in excess thereof)
Deformed bar	F	F	F (to be regarded as <u>390</u> in excess thereof)
Welded wire netting with a wire diameter of 4 mm or more	-	F (limited to cases where the netting is used for floor slabs)	F

In this table, F shall represent a standard strength as specified in Table 1 of Article 90.

(Concrete)

Article 97. The material strength of concrete shall be in accordance with the values given in the following table. Provided, that the material strength of bonds formed with deformed steel may, in a case where the Minister of Construction has separately specified values according to the type and quality of the deformed steel, be based on the said values.

Material strength (unit: <u>Newton/sq. mm</u>)			
Compression	Tension	Shear	Bond
F	$\frac{F}{10}$		$\frac{2.1}{1.8}$ (1.8 in using light weight aggregate)

(If the Minister of Construction has specified a different value for concrete with an F value that exceeds 21, the value so specified)

In this table, F shall represent a standard concrete strength (unit: Newton/sq. mm).

2. Omitted.

(Welding)

Article 98. The material strength at throat sections of welded joints shall be in accordance with the values given in the following table.

Type of joints	Material strength (unit: <u>Newton/sq. mm</u>)			
	Compression	Tension	Bending	Shear
Butt	F	F	F	$\frac{F}{\sqrt{3}}$
Other than butt	$\frac{F}{\sqrt{3}}$	$\frac{F}{\sqrt{3}}$	$\frac{F}{\sqrt{3}}$	$\frac{F}{\sqrt{3}}$

In this table, F shall represent a standard strength as specified in the table of Article 92.

II. Provisions Related to Fire Prevention

(Definition of Terms)

Article 1. In this Cabinet Order, the meaning of the terms in the following items shall be as defined in each item concerned:

(1) – (4) Omitted.

(5) Quasi-noncombustible materials: Building materials which, when they are heated with heat equivalent to the heat produced during a normal fire, satisfy the essential conditions specified in all items of Article 108-2 (for those used as finishing of the exterior of a building, item (1) and item (2) of the same Article) for 10 minutes after the beginning of the heating by the heat of a normal fire, and which the Minister of Construction has specified or which the Minister of Construction has approved.

(6) Fire retardant materials: Building materials which, when they are heated with heat equivalent to the heat produced during a normal fire, satisfy the essential conditions specified in all items of Article 108-2 (for those used as finishing of the exterior of a building, item (1) and item (2) of the same Article) for 5 minutes after the beginning of the heating by the heat of the normal fire, and which the Minister of Construction has specified or which the Minister of Construction has approved.

(Natural Lighting in Habitable Rooms of Schools, Hospitals, Children’s Welfare Facilities, etc.)

Article 19. Buildings as specified by Cabinet Order under Article 28 paragraph 1 of the Law shall be children’s welfare facilities, maternity clinics, rehabilitation facilities for physically disabled persons (excluding prosthetic appliances manufacturing facilities, information centers for visual/hearing impairment), social rehabilitation facilities for mentally disordered persons, protective institutions (excluding medical protective institutions), protective facilities for women, facilities for people with intellectual disability, welfare facilities for the elderly, fee charging homes for the elderly and maternal and child health facilities (hereinafter collectively referred to as “children’s welfare facilities, etc.”).

(Technical Standards Regarding Fireproof Performance)

Article 107. Technical standards as specified in the Cabinet Order under Article 2 item (7) of the Law shall be as mentioned in the following items:

(1) When each part of a building listed in the following table is heated with heat equivalent to the heat produced during a normal fire for the periods of time in the following table, the said parts are not deformed, melted, cracked, or undergo any other damage detrimental for structural strength.

Stories of buildings

	Uppermost story, and second to fourth stories from the uppermost story	Fifth to fourteenth stories from the uppermost story	Fifteenth story or more from the uppermost story
<hr/>			
Walls			
Partition walls (<u>limited to bearing walls</u>)	<u>1 hour</u>	<u>2 hours</u>	<u>2 hours</u>
External walls (<u>limited to bearing walls</u>)	<u>1 hour</u>	<u>2 hours</u>	<u>2 hours</u>
Columns	1 hour	2 hours	3 hours
Floors	1 hour	2 hours	2 hours
Beams	1 hour	2 hours	3 hours
Roofs	<u>30 minutes</u>	<u>30 minutes</u>	<u>30 minutes</u>
<u>Stairs</u>	<u>30 minutes</u>	<u>30 minutes</u>	<u>30 minutes</u>
<hr/>			

- 1) Omitted.
- 2) The above-roof parts mentioned in the preceding item shall comply with the same provisions of duration as those for the uppermost story specified in this table.
- 3) Omitted.

- (2) When walls and floors are heated with heat equivalent to heat produced during a normal fire for one hour (in the case of parts other than parts of external walls that are non-bearing walls that may catch fire, 30 minutes), the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) shall not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite.
- (3) When an external wall or roof is heated with heat equivalent to heat produced during a normal fire occurring inside them for 1 hour (in the case of parts other than parts of external walls that are non-bearing walls and roofs that may catch fire, 30 minutes) cracking or other damage that could cause the fire to spread outside the building shall not occur.

(Technical Standards Regarding Quasi-fireproof Performance)

Article 107-2. Technical standards specified by Cabinet Order under the provisions of Article 2 item (7-2) of the Law shall be as follows.

- (1) When each part of a building listed in the following table is heated with heat equivalent to the heat produced during a normal fire, the said part shall not be deformed, melted, cracked, or undergo any other damage detrimental to structural strength during the times after the heating begins listed in the following table.

<u>Walls</u>	
<u>Partition walls (limited to bearing walls)</u>	<u>45 minutes</u>
<u>External walls (limited to bearing walls)</u>	<u>45 minutes</u>
<u>Columns</u>	<u>45 minutes</u>
<u>Floors</u>	<u>45 minutes</u>
<u>Beams</u>	<u>45 minutes</u>
<u>Roofs</u> (excluding soffits)	<u>30 minutes</u>
<u>Stairs</u>	<u>30 minutes</u>

(2) When walls, floors, and soffits (excluding cases where an exterior wall acts as a barrier that effectively protects an attic or ceiling plenum from fire, and limited to parts that are in danger of igniting, same in Article 115-2-2 paragraph 1 and Article 129-2-3 paragraph 1.) are heated with heat equivalent to heat produced during a normal fire, for a period of 45 minutes after the beginning of the heating (in the case of parts other than parts in danger of igniting of external walls that are non-bearing walls, soffits (excluding cases where an exterior wall acts as a barrier that effectively protects an attic or ceiling plenum from fire, and limited to parts other than parts that are in danger of igniting), 30 minutes), the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) shall not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite.

(3) When an external wall or roof is heated with heat equivalent to heat produced during a normal fire occurring inside them (in the case of parts other than parts of external walls that are non-bearing walls and roofs that may catch fire, 30 minutes) cracking or other damage that could cause the fire to spread outside the building shall not occur for 45 minutes after heating begins.

(Technical Standards Regarding Fire Preventive Performance)

Article 108. Technical standards specified in the Cabinet Order under Article 2 item (8) of the Law shall be as mentioned in each of the following items:

(1) When exterior walls that are bearing walls are heated with heat equivalent to the heat produced during a normal fire occurring in the surroundings of a building, they shall not be deformed, melted, cracked, or undergo any other damage detrimental to structural strength for thirty minutes after the heating begins.

(2) When exterior walls and soffits are heated with heat equivalent to heat produced during a normal fire occurring in the surroundings of a building, the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) shall not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite for 30 minutes after the beginning of the heating.

(Noncombustible Performance and its Technical Standards)

Article 108-2. Performance and its technical standards specified by Cabinet Order under Article 2 item (9) of the Law shall, when the building material is heated with heat equivalent to the heat of a normal fire, satisfy the essential conditions in the following items (for those used as external finishing of the building, item (1) and item (2)) for 20 minutes after the beginning of the heating.

- (1) It shall not cause burning.
- (2) It shall not cause deformation, melting, cracking, or other damage detrimental to fire prevention.
- (3) It shall not generate smoke or gas detrimental to evacuation.

(Technical Standards for Principal Structural Parts of a Fireproof Building)

Article 108-3. In technical standards specified by Cabinet Order under Article 2 item (9-2) a) (2) of the Law, principal building parts shall correspond to one of the following items.

(1) It shall be confirmed by the fireproof property verification method that a principal building part conforms with the standards stipulated in items (a) and (b) (in the case of principal building parts other than external walls (a)).

(a) When each principal building part is heated by the heat of a fire predicted to occur inside the said building, the said principal building part shall satisfy the essential conditions in [1] to [3] below.

[1] Walls that are bearing walls, columns, floors, beams, roofs, and stairs shall not be deformed, melted, cracked, or damaged in any other way detrimental to structural strength by the dead weight and live load of the said building (in the case of principal building parts of a building in a heavy snow region designated by the Designated Administrative Agency under the provisions in the proviso to Article 86 paragraph 2, the dead weight, live load, and the snow load, same in the remainder of this Article).

[2] The temperature of surfaces of walls and floors other than the surfaces heated (limited to surfaces facing the interior) shall not increase to a temperature equal to or greater than a temperature specified by the Minister of Construction as a temperature that could ignite combustible materials in contact with the said surface.

[3] Walls and roofs shall not crack or undergo other damage that could allow the fire to spread outside the building.

(b) External walls shall, when heated with the heat of an ordinary fire occurring around the said building for 1 hour (parts other than parts in danger of catching fire, 30 minutes), satisfy the essential conditions in items [1] and [2] below.

[1] Walls that are bearing walls are not deformed, melted, cracked, or damaged in any other way detrimental to structural strength by the dead weight and live load of the said building

[2] The temperature of surfaces of external walls other than the surfaces heated

(limited to surfaces facing the interior) do not increase to a temperature equal to or greater than a temperature specified by the Minister of Construction as a temperature that could ignite combustible materials in contact with the said surface.

(2) It shall be approved by the Minister of Construction as one that conforms with the standards in (a) and (b) of the previous item (in the case of principal building parts other than external walls, (a)).

2. The “fireproof performance verification method” referred to in the preceding paragraph shall be a method of verifying the fireproof performance of principal building parts of the said building in conformity with the following specifications.

(1) The duration of the fire forecast to occur in the interior rooms of the said building shall be calculated using the following equation for each room in the interior of the said building.

$$tf = Q_r/60q_b$$

In this equation, the symbols tf , Q_r , and q_b shall represent the following values.

tf : duration of the fire in the said room (unit: minutes)

Q_r : the calorific value of the combustible material in the said room calculated by a method specified by the Minister of Construction according to the use and floor surface area of the said room, the surface areas of the parts of the walls, floor, and ceiling (where there is no ceiling, the roof) of the said room facing the interior of the room, and the types of building materials used to make the said parts (unit: mega-joule).

q_b : Calorific value per second of the combustible material in the said room calculated by a method specified by the Minister of Construction according to the use and total floor surface area of the said room and the height and surface area of openings in the said room (unit: megawatt).

(2) The heating time period that each principal structural part can maintain the essential conditions referred to in item (1) (a) [1] to [3] in the preceding paragraph when the said principal building part is heated with the heat of a fire predicted to occur inside the rooms of the said building (referred to in the remainder of this paragraph as “interior fire fireproof property retention time”) shall be obtained by a method specified by the Minister of Construction according to the construction method of the said principal building part, the dead weight and the live load of the said building and the change in the temperature of the surface of the said principal building part caused by the heating.

(3) The heating time period that the said external wall can maintain the essential conditions referred to in item (1) (b) [1] and [2] in the preceding paragraph when the said external wall is heated with the heat of a normal fire occurring around the said building (referred to in the remainder of this paragraph as “exterior fire fireproof property retention time”) shall be obtained by a method specified by the Minister of Construction according to the construction method of the said exterior wall and the dead weight and the live load of the said building.

(4) It shall be confirmed that each principal building part conforms to the following items (a) and (b) (for principal building parts other than external walls, (a)).

(a) The interior fire fireproof property retention time of each principal building part is equal to or greater than the duration of fire calculated by the equation referred to in item (1) for the room whose interior is faced by the principal building part.

(b) The exterior fire fireproof property retention time of each external wall is equal to or greater than 1 hour (for parts other than parts in danger of catching fire, 30 minutes).

3. In the case of a building covered by the provisions shown in the left column of the following table and whose principal building parts are covered by paragraph 1 item(1) or item (2), parts of the said building referred to in the middle column of the following table shall be considered to have the construction referred to in the right column of the following table.

<u>Article 112 paragraph 1, Article 122 paragraph 1, Article 128-4 paragraph 4, 129-13-2 item (3), and Article 145.</u>	<u>Principal building part</u>	<u>Fireproof construction</u>
<u>Article 112 paragraph 5 and paragraph 8, Article 117 paragraph 2, Article 122 paragraph 1, Article 129-13 item (3), Article 129-13-3 paragraph 3 item (4) and paragraph 4.</u>	<u>Wall or floor</u>	<u>Fireproof construction</u>
<u>Article 123 paragraph 1 item (4) and paragraph 3 item (5)</u>	<u>Wall or roof</u>	<u>Fireproof construction</u>
<u>Article 123 paragraph 1 item (1) and paragraph 3 item (2)</u>	<u>Wall</u>	<u>Fireproof construction</u>
<u>Article 120 paragraph 1 and paragraph 13, Article 129 – 2-5, paragraph 1 item (7)</u>	<u>Wall or floor</u>	<u>Quas-fireproof construction conforming to the standards specified in Article 115-2-2 paragraph 1 item (1)</u>
<u>Article 112 paragraph 9, Article 120 paragraph 1, 2, and 4, Article 121 paragraph 2, Article 122 paragraph 1, Article 123-2 Article 129-2 paragraph 1, and Article 129-2 paragraph 1</u>	<u>Principal building part</u>	<u>Quasi-fireproof construction</u>
<u>Article 112 paragraphs 9, 10 (excluding the proviso), 15, and 16, Article 126-2 paragraph 1 item (1), and paragraph 2 , Article 129 paragraphs 1 and 4, and Article 129-2-5 paragraph 1 item (7)</u>	<u>Wall or floor</u>	<u>Quasi-fireproof construction</u>
<u>Article 112 paragraph 12, Article 114 paragraphs 1 and 2</u>	<u>Wall</u>	<u>Quasi-fireproof construction</u>
<u>Article 112 paragraphs 10 and 11</u>	<u>External wall</u>	<u>Quasi-fireproof construction</u>

4. In the case of a building covered by the provisions shown in the left column of the following table and whose principal building parts are covered by paragraph 1 item (1) equipment installed in openings in floors or walls that are principal building parts of the said building (limited to cases where it has been confirmed by the fire separation verification method that when the said equipment is heated with the heat equivalent to the heat of a fire predicted to occur inside the rooms of the said building, the fire does not spread through to a surface other than the surface that is

heated) shall be considered to be fire preventive equipment shown in the right column of the following table, and in the case of a building covered by the provisions shown in the left column of the following table and whose principal building parts are covered by paragraph 1 item (2), equipment installed in openings in floors or walls that are principal building parts of the said building (limited to cases where it has been approved by the Minister of Construction that when the said equipment is heated with the heat equivalent to the heat of a fire predicted to occur inside the rooms of the said building, the fire does not spread through to a surface other than the surface that is heated) shall be considered to be fire preventive equipment shown in the right column of the following table.

<u>Article 112 paragraphs 1, 6, 7, 8, 13, 14, and 16, Article 122 paragraph 1, Article 123 paragraph 3 item (9), Article 129-2-5 paragraph 1 item 7, Article 129-13 item (3), Article 129-13-3 paragraph 1 item (3)</u>	<u>Special fire preventive equipment</u>
<u>Article 112 paragraphs 5, 8 to 10, 12 to 14, and 16, Article 122 paragraph 1, Article 123 paragraph 1 items (5) and (6), paragraph 2 item (2), and paragraph 3 item (9), Article 126-2 paragraph 1 item (1) and paragraph 2, Article 129 paragraph 1 and paragraph 4, Article 129-13-2 item (3)</u>	<u>Fire preventive equipment stipulated in Article 2 item (9-2) (b) of the Law</u>

5. The “fire separation verification method” in the preceding paragraph shall be a method of verifying the fire blocking performance during a fire of the equipment installed in the openings (referred to in the remainder of this paragraph as “opening equipment”) according to the following provisions.

(1) The duration of a fire predicted to occur in the room faced by the opening in which the said equipment is installed shall be calculated by the equation in paragraph 2 item (1).

(2) The heating time period that each opening equipment can block flame so it does not spread to a surface other than the surface heated when the said opening equipment is heated with the heat of a fire predicted to occur inside the rooms of the said building (referred to in the remainder of this paragraph as “retained flame blocking time”) shall be obtained by a method specified by the Minister of Construction according to the construction of the said opening equipment and the change in the temperature of the surface of the opening equipment caused by the heating.

(3) It shall be confirmed that the retained flame blocking time of each opening equipment is equal to or greater than the fire duration calculated according to the provisions of item (1).

(Fire Doors and Other Fire Preventive Equipment)

Article 109. Fire preventive equipment as specified by Cabinet Order under the provisions of Article 2 item (9-2) (b) of the Law and Article 64 of the Law shall be fire doors, drenchers and other equipment that effectively block flames.

2. External walls, wing walls, fences or the like that exist between openings of buildings and those parts of relevant boundary lines with the adjacent land lots, center lines of roads or center lines between external walls of two or more buildings on the same site (buildings with an aggregate of total floor areas not exceeding 500 sq m to be regarded as one building) which are at a distance of 3 m or less from the said openings in the case of first floors and 5 m or less from the said

openings in the case of second or higher floors, shall be regarded as fire preventive equipment as mentioned in the preceding paragraph.

(Technical Standards Regarding Flame Interruption Performance)

Article 109-2 Under the technical standards specified by Cabinet Order under Article 2 item (9-2) (b) of the Law, when fire preventive equipment is heated by heat equivalent to the heat of a normal fire, flame shall not spread to a surface other than the surface that is heated for 20 minutes after the beginning of the heating.

(Relative Story Displacement Angle of Buildings Whose Principal Building Parts Are of Quasi-fireproof Construction)

Article 109-2-3 Omitted.

(Technical Standards for Buildings Having Fireproof Property Equal to Buildings Whose Principal Building Parts Are of Quasi-fireproof Construction)

Article 109-3. Technical standards as specified by Cabinet Order under Article 2 item (9-3) (b) of the Law shall be as mentioned in one of the following items:

- (1) External walls shall be of fireproof construction, and roof construction shall be the construction stipulated in the provisions of Article 22 paragraph 1 of the Law, and excluding cases under Article 86-3 of the Law, the construction of portions of roofs which are liable to catch fire shall be such that when the said part is heated with heat equivalent to the heat of a normal fire that occurs inside a building, the said part is not cracked or undergo other damage that could permit flame to spread outside the building for 20 minutes after heating begins, and is a construction specified by the Minister of Construction or has been approved by the Minister of Construction.
- (2) Columns and beams which are principal building parts shall be made of noncombustible materials, other principal building parts shall be made of quasi-noncombustible materials, and portions of external walls liable to catch fire, roofs, and floors shall be constructed as mentioned as follows:
 - (a) Portions of external walls liable to catch fire shall be of fire preventive construction.
 - (b) Roofs shall be constructed as stipulated in Article 22 paragraph 1 of the Law.
 - (c) Floors shall be made of quasi-noncombustible materials. In addition, the construction of floors of the third or higher stories or of the ceilings directly below the said floors shall be such that when they are heated with heat equivalent to the heat of a normal fire that occurs inside these rooms, the said floors or ceilings are not deformed, melted, cracked, nor suffer other damage detrimental for structural strength for 30 minutes after the heating begins and the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) do not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite, and shall be made by a construction method that is specified by the Minister of Construction or one approved by

the Minister of Construction.

(Parts Specified by the Minister of Construction under Article 21 paragraph 1 of the Law)

Article 109-4. Parts specified by Cabinet Order under Article 21 paragraph 1 of the Law shall be a principal building part that supports its own weight or a live load (in the case of principal building parts of a building in a heavy snow region designated by the Designated Administrative Agency under the provisions in the proviso to Article 86 paragraph 2, the dead weight, live load, or the snow load).

(Technical Standards Regarding Performance of Roofs in Buildings in Districts in Cities Under Article 22 paragraph 1 of the Law)

Article 109-5. Technical standards specified by Cabinet Order under Article 22 paragraph 1 of the Law shall be those in the following items (In the case of buildings or parts of buildings provided for use as warehouses that store noncombustible products for other uses specified as similar uses by the Minister of Construction, and roofs whose principal building parts excluding the roof are made of quasi-noncombustible material, item 1).

- (1) Roofs shall be such that they are not ignited detrimental for fire prevention by embers produced by a normal fire.
- (2) Roofs shall not be melted, cracked or undergo other damage detrimental for fire prevention by embers produced by a normal fire.

(Technical Standards Regarding Quasi-fire Protection Performance)

Article 109-6. Technical standards specified by Cabinet Order under Article 23 of the Law shall be as follows.

- (1) An exterior wall that is a bearing wall shall be such that when it has been heated by heat equivalent to the heat of a normal fire occurring around a building, the said exterior wall is not deformed, melted, cracked, or damaged in other ways detrimental to structural strength for 20 minutes after the heating begins.
- (2) An exterior wall shall be such that when it has been heated by heat equivalent to the heat of a normal fire occurring around a building, the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) do not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite.

Article 110. Deleted.

(Fire Separations)

Article 112. Any building with a total floor area exceeding 1,500 sq m (excluding an area equivalent to 1/2 of the floor area of those parts which are provided with sprinkler equipment, water or foam fire-extinguishing equipment or other equipment similar thereto which automatically

operate; the same in this Article) whose principal building parts are of fireproof construction or which comes under either (a) or (b) of Article 2 item (9-3) of the Law shall be separated by floors and walls of quasi-fireproof construction that conforms to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1) or by specified fire protection equipment (Of fire protection equipment mentioned in Article 109, it shall be such that when it is heated with the heat of a normal fire, flame does not penetrate to a surface other than the surface heated for one hour after heating begins, and which either is of construction specified by the Minister of Construction or is of construction that has been approved by the Minister of Construction; the same in this Article.) within the aggregate of floor areas of each separation (excluding an area equivalent to 1/2 of the floor area of those parts which are provided with sprinkler equipment, water or foam fire-extinguishing equipment or other equipment similar thereto which automatically operate; the same in this Article) to 1,500 sq m or less. Provided, that regarding the parts of buildings coming under any of the following items, in inevitable circumstances by nature of use of the said parts, this shall not apply:

- (1) Omitted.
- (2) Parts of staircases, and hoistway of elevatory equipment (including passenger lobbies) which are separated by floors and walls of fireproof construction, quasi-fireproof construction that conforms to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1), or by designated fire preventive equipment.

2. Notwithstanding the provisions of the preceding paragraph, any quasi-fireproof building under the provisions of Article 27 paragraph 2 or Article 62 paragraph 1 of the Law whose total floor area exceeds 500 sq m (excluding those conforming to the technical standards mentioned in Article 109-3 item (2) or Article 115-2-2 paragraph 1 item (1)) shall be separated by floors and walls of quasi-fireproof construction conforming to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1) and by Special Fire preventive Equipment to limit the aggregate of floor areas of each separation to 500 sq m or less, and at the same time, those partition walls which are important from the viewpoint of fire protection shall be of quasi-fireproof construction and reach the attic space or above-ceiling space.

3. Notwithstanding the provisions of paragraph 1, any building conforming to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1) under the proviso to Article 21 paragraph 1, the proviso to Article 27 paragraph 1, Article 27 paragraph 2, or Article 62 paragraph 1, of the Law or any quasi-fireproof building conforming to the technical standards mentioned in Article 109-3 item (2) under Article 27 paragraph 2 or Article 62 paragraph 1 of the Law whose total floor area exceeds 1,000 sq m shall be separated by floors and walls of quasi-fireproof construction conforming to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1) and by special fire preventive equipment to limit the aggregate of floor areas of each separation to 1,000 sq m or less.

4. The preceding two paragraphs shall not apply to the parts of buildings coming under either of the following items, where the finishing on parts of ceilings (where there is no ceiling, the roof, same in paragraph 6, paragraph 7, and paragraph 9) and walls facing the interior of a room is quasi-noncombustible material:

- (1) ~ (2)Omitted.

5. Notwithstanding the provisions of paragraph 1, those parts of buildings which are on the eleventh or higher floors thereof and have an aggregate of floor areas of each floor exceeding 100 sq m shall be separated by floors or walls of fireproof construction and by fire preventive equipment

specified in item (9-2) (b) of Article 2 of the Law to limit the aggregate of floor areas to 100 sq m or less.

6. Notwithstanding the provisions of the preceding paragraph, the parts of buildings described in the said paragraph may be separated to limit the aggregate of floor areas of each separation to 200 sq m or less except in cases where fire preventive equipment specified in Article 2 item (9-2) (b) of the law that is not special fire preventive equipment is used for such separation, if the interior surface of the walls (excluding the part up to 1.2 m from the floor; the same in the next paragraph) and ceilings (excluding picture rails, window seats or the like; the same in the next paragraph) of the said parts is finished with noncombustible or quasi-noncombustible materials and the beds thereof are made of noncombustible or quasi-noncombustible materials.

7. Notwithstanding the provisions of paragraph 5, the parts of buildings described in the said paragraph may be separated to limit the aggregate of floor areas of each separation to 500 sq m or less except in cases where fire preventive equipment specified in Article 2 item (9-2) (b) of the law that is not special fire preventive equipment is used for such separation, if the interior surface of the walls and ceilings of the said parts is finished with noncombustible materials and the beds thereof are made of noncombustible materials.

8. The preceding three paragraphs shall not apply to those parts of staircases, hoistway of elevatory equipment (including passenger lobbies), corridors or other parts used for evacuation, and dwelling units in apartment buildings whose total aggregate floor area is less than 200 sq. m which are separated by floors and walls of fireproof construction and by special fire preventive equipment (fire preventive equipment specified in Article 2 item (9-2) (b) of the Law, in the case of buildings to be separated in accordance with the provisions of paragraph 5).

9. Regarding the parts for use as dwelling units (limited to those parts which have dwelling units on two or more stories), atriums, stairwells, hoistway of elevatory equipment, duct space or other similar parts (including public lavatories, public telephone boxes or other similar facilities which are accessible only through the said parts) of those buildings whose principal building parts are quasi-fireproof construction and have habitable rooms on basement levels or on the third or higher stories, the said parts (parts of the said buildings if the said parts cannot be separated by nature of their use, in cases where the said parts are those of buildings for use as described in the proviso to paragraph 1 and the interior surface of the walls (excluding the part up to 1.2 m from the floor) and ceilings (excluding picture rails, window seats and the like; the same in this paragraph) of the said parts is finished with quasi-noncombustible materials and the beds thereof are made of quasi-noncombustible materials) shall be separated from other parts (excluding corridors, balconies or other similar parts exposed to the outside air) by floors and walls of quasi-fireproof construction and fire preventive equipment specified in Article 2 item (9-2) (b) of the Law. Provided, that this shall not apply to parts of buildings coming under either of the following items:

(1) Omitted.

(2) Atriums, stairwells, hoistways of elevatory equipment, or other similar parts in detached houses which have three stories or fewer and a total floor area of 200 sq m or less or dwelling units of row houses or dwelling units in apartment buildings which have three stores or fewer and a total floor area of 200 sq m or less.

10. External walls adjoining floors or walls of quasi-fireproof construction (excluding those partition walls which are important from the viewpoint of fire protection as described in paragraph 2) as mentioned in paragraphs 1 through 5 or the preceding paragraph, or external walls adjoining fire preventive equipment specified in Article 2 item (9-2) (b) of the Law, shall be of quasi-

fireproof construction for a width of 90 cm or more including the part adjoining the said exterior walls. Provided, that this shall not apply in cases where pent roofs, floors, wing walls or the like of quasi-fireproof construction project from the said external walls by 50 cm or more, so that it effectively prevents the spread of fire.

11. If the part which is required to be of quasi-fireproof construction under the preceding paragraph has an opening, fire preventive equipment specified in Article 2 item (9-2) (b) of the Law shall be installed at the said opening.

12. If parts of buildings come under any of the items of Article 24 of the Law, the said parts shall be separated from other parts by walls of quasi-fireproof construction or by fire preventive equipment specified in Article 2 item (9-2) (b) of the Law.

13. If parts of buildings come under any of the items of Article 27 paragraph 1 or 2 of the Law, the said parts shall be separated from other parts by walls of quasi-fireproof construction conforming to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1) and by special fire preventive equipment.

14. Specified fire preventive equipment to be used for separation under paragraphs 1 through 5, paragraph 8 or 13 and fire preventive equipment specified in Article 2 item (9-2) (b) of the Law used for separation under paragraphs 5, 8, 9, or 12, shall have a construction specified in the following according to the separation listed below:

(1) Specified fire preventive equipment to be used for separation under the provisions of the main clause of paragraph 1 or of paragraph 2 or 3, and fire preventive equipment specified in Article 2 item (9-2) (b) of the Law to be used for separation under the provisions of paragraph 5, shall satisfy the essential conditions listed in the following items (a) to (c), and shall have a construction specified by the Minister of Construction or which has been approved by the Minister of Construction.

(a) The equipment shall be either permanently closed or operating or it shall be possible for it to be closed or operated at any time.

(b) Equipment installed on parts provided for use as principal corridors, stairs or other passageways leading from habitable rooms to the ground shall be constructed so that they do not obstruct evacuation or fire protection when both closed and when operating.

(c) Equipment other than that which is always closed or always operating shall close automatically or operate automatically when the occurrence of a fire has led to either generation of smoke or sudden increases in temperature.

(2) Specified fire preventive equipment to be used for separation under the provisions of paragraph 1 item (2) or paragraph 4, 8, or 13, and fire preventive equipment specified in Article 2 item (9-2) (b) of the Law to be used for separation under the provisions of paragraphs 8, 9, or 12, shall satisfy the essential conditions listed in the following items (a) to (c), and shall have a construction specified by the Minister of Construction or which has been approved by the Minister of Construction..

(a) The equipment shall satisfy the essential conditions specified in (a) and (b) in the preceding item.

(b) It shall have smoke blocking performance that is not detrimental for evacuation or fire prevention, and equipment other than that which is always closed or always operating shall close automatically or operate automatically when the occurrence of a fire has led to generation of smoke.

15. If water pipes, electric wire conduits or other pipes pass through floors or walls of quasi-fireproof construction as specified in paragraphs 1 through 5, paragraph 8, the main clause of paragraph 9, the main clause of paragraph 10, paragraph 12 or 13, or pent roofs, floors, wing walls or the like as mentioned in the paragraph 10 proviso in cases where the said proviso is applicable (referred to in this and next paragraphs as “fire separations of quasi-fireproof construction, etc.”), any gap between the said pipes and fire separations of quasi-fireproof construction, shall be filled with mortar or other noncombustible material.

16. If air ducts of ventilation, heating or cooling equipment pass through fire separations of quasi-fireproof construction, etc. (excluding the cases designated by the Minister of Construction as not presenting objection from the viewpoint of fire protection), those parts of the said air ducts which pass through the said fire separations of quasi-fireproof construction, etc. or parts close thereto shall be equipped by a method specified by the Minister of Construction with specified fire preventive equipment (in a case where it passes through a fire separation of quasi-fireproof construction that should be separated by fire protective equipment specified by Article 2 item (9-2) (b) of the Law, fire protective equipment specified by Article 2 item (9-2) (b) of the Law) that satisfies the essential conditions listed in the following items, and has a construction specified by the Minister of Construction or which has been approved by the Minister of Construction:

- (1) Constructed so as to close automatically when the occurrence of a fire has led to either generation of smoke or sudden increases in temperature.
- (2) If it is closed, it shall have smoke blocking performance that is not detrimental for fire prevention.

(Fire Walls in Wooden Buildings, etc.)

Article 113. Fire walls shall be constructed as specified in each of the following items:

- (1) – (2) Omitted.
- (3) Both ends and top of fire walls shall project from external walls and roofs by 50 cm or more (10 cm or more in a case where within 1.8 m from the center line of the fire wall, the external wall is fire preventive construction, and the construction of the roof is such that when the roof is heated with heat equivalent to heat produced during a normal fire occurring inside the roof, cracking or other damage that could cause the fire to spread outside the roof shall not occur for 25 minutes after heating begins, and if it has a construction method specified by the Minister of Construction or one approved by the Minister of Construction, there is no opening in these parts). Provided, that if external walls or roofs of those parts which are provided with fire walls are of fireproof construction over a width of 3.6 m or more in the ridge direction including the said fire walls, and the said parts are not provided with openings or are provided with openings having fire preventive equipment specified by Article 2 item (9-2) (b) of the Law, the said parts shall not be subject to the provisions of this item.

(4) Openings in fire walls shall be 2.5 m or less in width and height and shall be provided with special fire preventive equipment which is constructed as specified in item (1) of paragraph 14 of the preceding Article.

2. Omitted.

(Separation Walls, Partition Walls and Dividing Walls in Buildings)

Article 114. Separation walls between each dwelling unit of row houses or apartment houses shall be of quasi-fireproof construction, and shall reach the attic space or above-ceiling space.

2. Regarding the parts of buildings for use as schools, hospitals, clinics (excluding those having no patient accommodation facilities), children's welfare facilities, etc., ___hotels/inns, boarding houses, dormitories or markets, partition walls important from the viewpoint of fire prevention shall be of quasi-fireproof construction and reach the attic space or above-ceiling space.

3. If buildings exceeding 300 sq m in building area have wooden roof trusses, the attic space of the said roof trusses shall be provided with dividing walls of quasi-fireproof construction at least every 12 m in the ridge direction. Provided, that this shall not apply to buildings coming under either of the following items:

(1) Buildings which conform to the standards as mentioned in Article 2 paragraph 1 item (9-2) (a) of the Law.

(2)~(3) Omitted.

4. If connecting corridors between two buildings other than fireproof buildings each of which have a total floor area exceeding 200 sq m, have wooden roof trusses and have a length in the ridge direction exceeding 4 m,___ the attic space of the said connecting corridors shall be provided with dividing walls of quasi-fireproof construction.

5. The provisions of Article 112 paragraph 15 shall apply mutatis mutandis in cases where water supply pipes, electric wire conduits or other pipes pass through the separation walls described in paragraph 1, partition walls described in paragraph 2, or dividing walls described in the preceding two paragraphs, and the provisions of paragraph 16 of the same Article shall apply mutatis mutandis in cases where air ducts of ventilation, heating or cooling equipment pass through the said separation walls, partition walls or dividing walls. In this case, the words "special fire preventive equipment" in the paragraph shall be read as "fire preventive equipment specified under the provisions of Article 109 and is such that when it is heated by heat equivalent to the heat of a normal fire, flame does not spread to a surface other than the surface that is heated for 25 minutes after the beginning of the heating, and is a construction method specified by the Minister of Construction or a construction method approved by the Minister of Construction.

(Chimneys Built within Buildings)

Article 115. Chimneys built within buildings shall be constructed as specified in the following items:

(1) Chimneys shall project from roofs by 60 cm or more in vertical distance from the roof surface.

(2) Omitted.

(3) Chimneys shall conform to either item (a) or item (b) below.

(a) Chimneys shall conform to the following standards.

[1] Those parts of chimneys that pass through attic space, above-ceiling space, under-floor space, etc. shall be made of metal or asbestos and covered with noncombustible materials other than metal or shall be made of noncombustible material other than metal at least 10 cm in thickness.

[2] Chimneys shall be installed at least 15 cm away from wooden or other combustible materials that are part of the building. Provided that this shall not apply to parts that are made of or covered with noncombustible material other than metal with a thickness of 10 cm or more.

(b) It shall be such that parts of buildings around chimneys (in the case of parts passing through attic space, above-ceiling space, under-floor space, etc., including dust accumulated the chimney) are not ignited by the heat of exhaust gasses or other products inside the chimney and shall be approved by the Minister of Construction.

(4) Chimneys of wall fireplaces made of brick construction, stone construction, or concrete block construction (limited to interior parts), shall either be made of cement mortar or earthenware flues shall be inserted in the chimneys.

(5) Omitted.

(6) Parts of chimneys in danger of corrosion or deterioration by exhaust gasses and other products shall be made of materials resistant to corrosion and deterioration or shall be protected by effective rust prevention or corrosion prevention treatment.

(7) Chimneys of boilers shall conform, in addition to the provisions of each preceding item, to such standards regarding the height from the center of openings where flues are connected to the said boilers to the top of the said chimneys, as established by the Minister of Construction according to the fuel consumption of the boiler (specified by the Minister of Construction upon hearing the opinion of the Minister of International Trade and Industry) and shall be of construction specified by the Minister of Construction as being necessary for fire prevention.

2. The provisions of items (1) to (3) of the preceding paragraph shall not apply to chimneys which conform to standards specified by the Minister of Construction as presenting no objection from the viewpoint of fire prevention due to low temperatures of the exhaust gases or other products concerned or for other reasons.

(Technical Standards, etc. for Buildings with No Need for Fire Walls)

Article 115-2. The technical standards established by Cabinet Order under Article 26 item (2) (b) of the Law shall be as follows:

(1) Buildings shall conform to the standards mentioned in (a) and (b) of Article 46 paragraph 2 item (1).

(2) ~ (3) Omitted.

(4) External walls and soffits shall be fire preventive construction, and floors of the first floor (limited to those with basements directly below) and floors of the second floor (excluding floors of passageways, etc.) shall be such that when they are heated with heat equivalent to the heat produced during a normal fire occurring in a room, they are not deformed, melted, cracked, or undergo any other damage detrimental to structural strength for 30 minutes after the heating begins, and that the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) shall not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite, and shall be a construction that has been specified by the Minister of Construction or has been approved by the Minister of Construction as that having performance. Provided, that this shall not apply to external walls and soffits of buildings which the Designated Administrative Agency concludes that those buildings present no objection from the viewpoint of prevention of the spread of fire judging from surrounding conditions.

(5) Omitted.

(6) In kitchens, bathrooms and other rooms, parts installed with kitchen ranges, cooking stoves and other fire-using equipments and apparatus shall be separated from the other parts by floors and walls of fireproof construction (limited to those with water pipes, electric wire conduits, and other pipes passing through the floors and walls as well as construction of their surrounding parts being a construction specified by the Minister of Construction), or by special fire-preventive equipment of construction as specified in Article 112 paragraph 14 item (1).

(7) Regarding each room and passageway of buildings, the interior surfaces (excluding picture rails, window seats or the like) of walls (excluding the part up to 1.2 m from the floor) and those of ceilings (roofs, if there are no ceilings) shall be finished with fire retardant materials or be provided with sprinkler equipment, water fire-extinguishing equipment, foam fire-extinguishing equipment or other equipment similar thereto which automatically operate, and with smoke exhaust equipment which conforms to the provisions of Article 126-3.

(8) The construction of joints/connections fastening such principal building parts as columns and beams shall be a construction specified by the Minister of Construction as one which can effectively prevent a decline of its strength when heated by the heat of a normal fire.

(9) Omitted.

2. Omitted.

(Technical Standards, etc. for Special Buildings Which Need Not be Fireproof Buildings)

Article 115-2-2. Technical standards established by Cabinet Order under the proviso to Article 27 paragraph 1 of the Law shall be as follows for buildings in Quasi-fire Protection Districts and shall be as mentioned in items (1) to (4) for buildings in districts other than Fire Protection and Quasi-fire Protection Districts.

(1) Walls, columns, beams, and soffits of roofs that are principal building parts shall conform to

the standards in (a), (b), and (c) below and shall be a construction specified by the Minister of Construction or a construction specified by the Minister of Construction.

(a) Parts of buildings listed in the following table shall be such that when each of the said parts is heated by the heat of a normal fire, it is not deformed, melted, cracked, or undergoes any other damage detrimental to structural strength for the periods of time after the heating begins listed in the following table.

<u>Walls</u>	
<u>Partition walls (limited to bearing walls)</u>	<u>1 hour</u>
<u>External walls (limited to bearing walls)</u>	<u>1 hour</u>
<u>Columns</u>	<u>1 hour</u>
<u>Floors</u>	<u>1 hour</u>
<u>Beams</u>	<u>1 hour</u>

(b) Walls, floors, and soffits of roofs shall be such that when they are heated with heat equivalent to the heat produced during a normal fire, the temperature of surfaces other than the surface that is heated (limited to parts facing the interior) shall not rise to a temperature equal to or higher than a temperature specified by the Minister of Construction as a temperature that could cause combustible material in contact with the said surface to ignite for 1 hour after heating begins.

(c) External walls (excluding parts of external walls that are non-bearing walls other than parts danger of catching fire) shall be such that when exposed to the heat of a normal fire occurring in a room, cracking or other damage that could cause the fire to spread outside the building shall not occur for one hour after heating begins.

(2) All bedrooms in boarding houses, all dwelling units in apartment houses, and all bedrooms in dormitories, (hereinafter called bedrooms in boarding houses, etc.) shall be provided with balconies effective for evacuation or similar facilities. Provided, that this shall not apply in cases where the passageways, such as principal corridors and stairs, leading from each bedroom in boarding houses, etc. to the ground level are directly open to the outside air, and the openings of the rooms in boarding houses, etc. facing the said passageways are equipped with fire preventive equipment specified in Article 2 item (9-2) (b) of the Law.

(3) Omitted.

(4) Passageways at least 3 m wide (limited to those which lead to a roadway in contact with the site) shall be provided around the building (excluding portions of the building facing the roadway). Provided, that this shall not apply in cases where the said building conforms to the following standards:

(a) Omitted.

(b) Passageways such as principal corridors and stairways, leading from each bedroom in boarding houses, etc. to the ground level are directly open to the outside air, and the openings facing the said passageways of each room in boarding houses, etc. are equipped with preventive equipment specified in Article 2 item (9-2) (b) of the Law.

(c) In cases where there is a danger of fire spreading from an opening in an external wall to

an opening in the story above the story where the said opening is located, a pent roof or similar equipment with a construction such that when it is heated with the heat of a normal fire, it does not crack or undergo other damage that could cause the fire to spread to a surface other than the surface that is heated for 20 minutes after heating begins, and is of construction specified by the Minister of Construction or of construction approved by the Minister of Construction, shall be installed above the said opening in the external wall so that it effectively prevents the spread of fire.

- (5) Fire preventive equipment specified in Article 2 item (9-2) (b) shall be installed in openings in external walls of each bedroom in boarding houses, etc. on the third floor (including the second and lower floors in cases where the bedroom unit concerned has two or more stories) and in openings facing parts other than the bedroom unit concerned (among cases where openings of a bedroom unit are in external walls or face corridors, stairs, or other passageways directly exposed to the outside air, excluding those cases where there is no other opening in an area less than 90 cm from the openings of the bedroom unit concerned or cases where there is a pent roof or a wing wall, either of which is protruding 50 cm or more, or a similar structure which has a construction specified in (b) of the preceding item and which provides a barrier that effectively prevents fire).

2. Omitted.

(Provision of Through Stairs)

Article 120. On floors (excluding those constituting underground shopping malls; the same in the next Article paragraph 1) other than evacuation floors of buildings, through stairs (including slope-ways; hereinafter the same) leading to evacuation floors or to the ground shall be so provided that the walking distance from any part of a habitable room to one of the through stairs does not exceed the values given in the following table.

Type of habitable rooms	Construction	
	When principal building parts are of quasi-fireproof construction, or are made of non-combustible materials (unit: m)	Other cases (unit: m)
(1) Habitable rooms with no openings such as windows which come under Article 116-2 paragraph 1 item (1) or habitable rooms for principal uses in special buildings for use as listed in paragraph (4) of column (A) of Annexed Table 1 of the Law	30	30
(2) Habitable rooms for principal uses in special buildings for use as listed in paragraph (2) of column (A) of Annexed Table 1 of the Law	50	30
(3) Habitable rooms other than those in (1) and (2)	50	40

2. Regarding the habitable rooms of those buildings whose principal building parts are of quasi-fireproof construction, or are made of noncombustible materials, each value of the table in the preceding paragraph shall be increased by 10, if the interior surface (excluding picture rails,

window seats and the like) of the walls (except the part up to 1.2 m from the floor) and ceilings (roofs, if there are no ceilings) of the said habitable rooms and principal corridors, stairs and other passageways leading to the ground from the said habitable rooms is finished with__quasi-noncombustible materials. Provided, that this shall not apply to habitable rooms on the fifteenth or higher floors.

3. Omitted.

4. Regarding two or three-story dwelling units of apartment houses, whose principal building parts are of__quasi-fireproof construction and which are provided with entrances/exits on only one floor, the provisions of paragraph 1 shall not apply to the floors of the said dwellings units other than those with the said entrances/exits if the walking distance from any part of the habitable rooms on the said floors to one of the through stairs leading to the evacuation floor or the ground does not exceed 40 m.

(Provision of Two or More Through Stairs)

Article 121. Omitted.

2. In applying the provisions of the preceding paragraph to buildings whose principal building parts are of__quasi-fireproof construction or are made of noncombustible materials, “50 sq m”, “100 sq m”, and “200 sq m” in the said paragraph shall read “100 sq m”, “200 sq m” and “400 sq m”, respectively.

3. Omitted.

(Provision of Escape Stairs)

Article 122. Through stairs leading to the fifth or higher floors (excluding cases of buildings whose principal building parts are either quasi-fireproof construction or are made of noncombustible materials and in which the aggregate of the floor areas of the fifth and higher floors is less than 100 sq m) or to the second or lower basement levels (excluding cases of buildings whose principal building parts are either quasi-fireproof construction or are made of noncombustible materials and in which the aggregate of the floor areas of the second and lower basement levels is less than 100 sq m) of buildings shall be escape stairs or special escape stairs in accordance with the provisions of the next Article, and through stairs leading to the fifteenth or higher floors or to the third or lower basement levels of buildings shall be special escape stairs in accordance with the provisions of Article 123 paragraph 3. Provided, that this shall not apply to buildings whose principal building parts are of quasi-fireproof construction (excluding parts of stairways, parts of shafts of elevators (including parts of elevator lobbies used to enter or exit the said elevators), corridors, and other parts provided for use for evacuation which are separated by floors or walls of fireproof construction, or by special fire preventive equipment), and which are separated into sections with aggregate floor areas not exceeding 100 sq. m (in dwellings of apartment houses, 200 sq. m) by floors or walls of fireproof construction or by special fire preventive equipment (including fire preventive equipment specified in Article 2 item (9-2) (b) of the Law that is installed in windows with an opening surface area less than 0.2 sq. m t for ventilation purposes facing a stairway open directly to the outside air).

2.-3. Omitted.

(Construction of Escape Stairs and Special Escape Stairs)

Article 123. Escape stairs provided inside buildings shall be constructed as specified in each of the following items:

(1)~ (3) Omitted.

(4) Openings provided in those walls of staircases which face outside (excluding openings having an area not exceeding 1 sq m and provided with fire preventive equipment specified in Article 2 item (9-2) (b) of the Law and fixed-sash windows) shall be located away from openings provided in parts of the building concerned other than for the said staircases and away from the walls and roofs (excluding walls and roofs of fireproof construction) of the said building other than for the said staircases by 90 cm or more. Provided, that this shall not apply in the case of the proviso to Article 112 paragraph 10.

(5) In cases where windows are provided in staircase walls facing the inside of buildings, the area of each window shall not exceed 1 sq m, fire preventive equipment specified in Article 2 item (9-2) (b) of the Law and fixed-sash windows shall be installed therein.

(6) Doorways to stairs shall be provided with fire preventive equipment specified in Article 2 item (9-2) (b) of the Law which are constructed as specified in Article 112 paragraph 14 item (2). In this case, the said fire doors or parts thereof which can be manually opened and will close automatically shall be installed to open toward the direction of evacuation.

(7) Omitted.

2. Escape stairs provided on the outside of buildings shall be constructed as specified in each of the following items:

(1) Stairs shall be provided at a distance of 2 m or more away from openings (excluding those having an area not exceeding 1 sq m and provided with fire preventive equipment specified in Article 2 item (9-2) (b) of the Law and fixed-sash windows) other than the doorways leading to those stairs.

(2)~(3) Omitted.

3. Special escape stairs shall be constructed as specified in each of the following items:

(1) The inside of buildings and staircases shall be connected via balconies or via attached rooms which are provided with windows open to the outside air or smoke exhaust equipment (limited to those with construction specified by the Minister of Construction).

(2) ~ (4) Omitted.

(5) Openings provided in those walls of staircases, balconies or attached rooms which face outside (excluding openings having an area not exceeding 1 sq m and provided with fire preventive equipment specified in Article 2 item (9-2) (b) of the Law and fixed-sash windows) shall be located away from openings provided in parts of the building concerned other than for the said staircases, balconies or attached rooms and away from the walls and roofs (excluding walls and roofs of fireproof construction) of the said building other than for the said staircases, balconies or attached rooms by 90 cm or more, and shall be provided in parts of buildings other than the portions liable to catch fire from outside. Provided, that this shall not apply in the case of the proviso to Article 112 paragraph 10.

(6)~(8) Omitted.

(9) Doorways leading from the inside of buildings to balconies or attached rooms shall be provided with special fire preventive equipment as specified in paragraph 1 item (6), and doorways leading from balconies or attached rooms to staircases shall be provided with doors as specified in the said item.

(10)~(11) Omitted.

(Calculation of Floor Area, etc. Regarding Dwelling Units of Apartment Houses)

Article 123-2. Regarding two or three-story dwelling units of apartment houses, whose principal building parts are of quasi-fireproof construction and which are provided with entrances/exits on only one floor, the floors other than those with the said entrances/exits shall be regarded as floors with entrances/exits in applying the provisions of Article 119, Article 121 paragraph 1 item (4) (including cases where the phrases therein are replaced under paragraph 2 of the said Article), Article 122 paragraph 1 and the preceding Article paragraph 3 item (11) if the walking distance from any part of the habitable rooms on the said floors to one of the through stairs leading to the evacuation floor or the ground does not exceed 40 m.

(Installation)

Article 126-2. Smoke exhaust equipment shall be installed in special buildings for use as mentioned in paragraphs (1) through (4) of column (A) of Annexed Table 1 of the Law with a total floor area exceeding 500 sq m, in buildings with three or more stories and a total floor area exceeding 500 sq m (excluding those habitable rooms which are provided in parts of buildings at a height of 31 m or less and are separated at every 100 sq m or less of floor area by partition walls, or hanging walls projecting downward from the ceiling by 50 cm or more, which are made of or finished with noncombustible materials, or other walls which are as effective as or more effective than the preceding two in obstructing the flow of smoke and are made of or finished with noncombustible materials; hereinafter referred to as “smoke prevention walls”), in habitable rooms with no openings such as windows coming under Article 116-2 paragraph 1 item (2) or in those habitable rooms in buildings with a total floor area exceeding 1,000 sq m each of which has a floor area exceeding 200 sq m (excluding those habitable rooms which are provided in parts of buildings at a height of 31 m or less and are separated at every 100 sq m or less of floor area by smoke prevention walls). Provided, that this shall not apply to buildings or parts of buildings coming under either of the following items:

(1) Parts of special buildings for use as mentioned in paragraph (2) of column (A) of Annexed Table 1 of the Law, which are separated by floors or walls of fireproof or quasi-fireproof construction or by fire preventive equipment specified in Article 2 item (9-2) (b) of the Law, and which have a floor area of 100 sq m (200 sq m in case of dwelling units of apartment houses which are provided in parts of buildings at a height of 31 m or less) or less.

(2)~(4) Omitted.

(5) Parts of buildings specified as those where smoke or gas does not descend to a height detrimental for evaluation when a fire occurs by the Minister of Construction accounting for the height of the ceilings and the categories of materials used to finish the walls and ceilings.

2. In cases where buildings are separated by those floors and walls which have no openings

and are of quasi-fireproof construction, or by fire preventive equipment specified by Article 2 item (9-2) (b) of the Law of construction specified by the provisions of Article 112 paragraph 14 item (2), the separated parts shall be regarded as different buildings in applying the provisions of this Section.

(Construction)

Article 126-3. The smoke exhaust equipment mentioned in paragraph 1 of the preceding Article shall be constructed as specified in each of the following items:

(1)~(11) Omitted.

(12) In addition to following the provisions of the preceding items, smoke exhaust equipment shall be constructed by a method specified by the Minister of Construction as a method that permits the effective discharge of smoke from fire.

2. The provisions of the preceding paragraph shall not apply to smoke exhaust equipment equipped with a blower or other smoke exhaust equipment with special construction that conforms to technical standards specified by the Minister of Construction as standards that permit the effective discharge of smoke from a normal fire.

(Installation)

Article 126-4. Lighting apparatus for emergency use shall be installed in the habitable rooms of special buildings for use as mentioned in paragraphs (1) through (4) of column (A) of Annexed Table 1 of the Law, habitable rooms of buildings with three or more stories and a total floor area exceeding 500 sq m, habitable rooms with no openings such as windows as described in Article 116-2 paragraph 1 item (1), or habitable rooms in buildings with a total floor area exceeding 1,000 sq m, as well as corridors, stairs and other passageways (excluding passageways exposed to the outside air in a manner effective for natural lighting) leading from the said habitable rooms to the ground, in addition to other parts of buildings usually requiring lighting apparatus. Provided, that this shall not apply to buildings or parts of buildings coming under any of the following items:

(1)~(3) Omitted.

(4) An evacuation stairway or a room in the floor directly above or below an evacuation stairway that is not detrimental for evacuation or similar parts specified by the Minister of Construction.

(Construction)

Article 126-5. The lighting apparatus for emergency use mentioned in the preceding Article shall be constructed as described in any of the following items:

(1) It shall be constructed as stipulated in (a) to (d) below.

(a) The lighting apparatus shall be of direct lighting type and capable of ensuring lighting of 1 lx or more at floor level.

- (b) The lighting fixtures shall be constructed by a construction method specified by the Minister of Construction as a method that prevents the luminance from declining conspicuously even when the temperature has increased during a fire.
- (c) A supplementary electric supply shall be provided.
- (d) It shall be constructed as specified by the Minister of Construction as necessary to ensure lighting for emergency use.
- (2) It shall automatically light up when the power fails during a fire, and shall be approved by the Minister of Construction as one capable of ensuring lighting of 1 lx or more at floor level until evacuation is completed even when the temperature inside a room of the said building has risen.

(Installation)

Article 126-6. Third or higher floors of buildings at a height of 31 m or less (excluding floors provided for use for the storage of noncombustible goods or for other uses which are as unlikely or more unlikely to cause a fire to occur, and floors into which entrance from the outside must be forbidden for special reasons specified by the Minister of Construction, and which can be entered from the floors directly above or directly below) shall be provided with entrances for emergency use. Provided, that this shall not apply to those cases which come under either of the following items:

(1)~ (2) Omitted.

(Passageways within Building Sites of Large-scale Wooden Buildings, etc.)

Article 128-2. Buildings whose principal building parts are entirely of wooden construction (excluding buildings conforming to the standards in Article 2 item (9-2) (a) of the Law) with a total floor area exceeding 1,000 sq m or buildings whose principal building parts are partly of wooden construction with a total floor area (excluding the floor area of any part whose principal building parts are of fireproof construction and are separated from other parts by walls of fireproof construction and by special fire preventive equipment; the same hereinafter in this Article) exceeding 1,000 sq m shall be surrounded by passageways with a width of 3 m or more (except for parts bounded by roadways). Provided, that if the total floor area is 3,000 sq m or less, the width of the said passageways may be 1.5 m or more along the boundary lines with the adjacent land lots.

2.~5. Omitted.

(Underground Shopping Malls)

Article 128-3. All business establishments of underground shopping malls shall abut on underground passages as described in each of the following items for 2 m or more. Provided, that public lavatories, public telephone boxes and the like may abut on underground passages for less than 2 m:

- (1) The walls, columns, floors, beams and floor slabs used shall have the fireproof properties specified by the Minister of Construction.

(2)~(5) Omitted.

(6) Underground passages shall be provided with the lighting apparatus for emergency use, smoke exhaust equipment and drainage equipment which is construction as specified by the Minister of Construction.

2. In cases where business establishments of underground shopping malls abut on each other, the said business establishments shall be separated by floors and walls of fireproof construction and by special fire preventive equipment which is constructed as specified in Article 112 paragraph 14 item (2).

3. Each business establishment of underground shopping malls shall be separated from the underground passages concerned by floors and walls of fireproof construction and by special fire preventive equipment which is constructed as specified in Article 112 paragraph 14 item (2).

4. Omitted.

5. The provisions of Article 112 paragraphs 5 through 11, paragraphs 14 through 16, and Article 129-2-2 paragraph 1 item (7) (limited to the part pertaining to the provisions of Article 112 paragraph 15) shall apply mutatis mutandis to each business establishment of underground shopping malls. In this case, the phrase of “those parts of buildings which are on the eleventh or higher floors thereof and have an aggregate of floor areas of each floor” in Article 112 paragraph 5 shall be replaced with “those parts of each business establishment of underground shopping malls which have an aggregate floor areas”, the word of “buildings” in paragraphs 6 and 7 of the same Article with “each business establishment of underground shopping malls”, the phrase of “those buildings whose principal building parts are of quasi-fireproof construction and have habitable rooms on basement levels or on the third or higher floors” in paragraph 9 of the same Article with “each business establishment of underground shopping malls” the phrase of “parts of buildings” in the said paragraph with “parts of each business establishment of underground shopping malls” and the phrase “quasi-fireproof construction” in the same paragraph with “fireproof construction,” and the phrase “quasi-fireproof construction” in paragraph 10 of the same Article with “fireproof construction” and the phrase “quasi-fireproof construction which conforms to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1)” in Article 129-2-5 paragraph 1 item (7) with “fireproof construction.”

6. Omitted.

Annex Table (Special Buildings)

Article 129. In special buildings as mentioned in item (1) of paragraph 1 of the preceding Article, the interior surface (excluding picture rails, window seats and the like; the same in this Article) of the walls (excluding the part up to 1.2 m from the floor; the same in paragraph 4) and ceilings (roofs, if there are no ceilings; the same in this Article) of habitable rooms for use as mentioned in the said item (if special buildings for use as shown in paragraph (2) of column (A) of Annexed Table 1 of the Law are fireproof buildings or quasi-fireproof buildings coming under Article 2 item (9-3) (a) of the Law; excluding habitable rooms of those parts of the said special buildings which are offered for the said use and are separated by floors and walls of quasi-fireproof construction and by fire preventive equipment specified in Article 2 item (9-2) (b) of the Law every 100 sq m or less (200 sq m or less for dwelling units of apartment houses) of the aggregate of floor areas) shall be finished as specified in item (1). The interior surface of the walls and ceilings of principal corridors, stairs and other passageways leading from habitable rooms for the said use to the ground shall be finished as specified in item (2).

(1) Finishing specified in (a) or (b) below.

(a) That which is made of fire retardant material (in parts of interior surfaces of ceilings of habitable rooms provided for the said use in buildings with habitable rooms in the third and higher floors, quasi-noncombustible material)

(b) That which is made of materials specified by the Minister of Construction combined by a method specified by the Minister of Construction as equivalent to the finishing mentioned in (a)

(2) Finishing specified in (a) or (b) below.

(a) That which is made of quasi-noncombustible material

(b) That which is made of materials specified by the Minister of Construction combined by a method specified by the Minister of Construction as equivalent to the finishing mentioned in (a)

2. In special buildings as mentioned in item (2) of paragraph 1 of the preceding Article, the interior surface of the walls and ceilings of those parts of the said special buildings which are offered for use as mentioned in the said item, and the interior surface of the walls and ceilings of principal passageways leading from the said parts to the ground, shall be finished as specified in item (2) of the preceding paragraph.

3. In special buildings as mentioned in item (3) of paragraph 1 of the preceding Article, the interior surface of the walls and ceilings of habitable rooms as specified in the said item, and the interior surface of the walls and ceilings of principal corridors, stairs or other passageways leading from the said habitable rooms to the ground, shall be finished as specified in item (2) of paragraph 1.

4. In buildings with three or more stories and a total floor area exceeding 500 sq m, those with two stories and a total floor area exceeding 1,000 sq m or those with one story and a total floor area exceeding 3,000 sq m (excluding those for use as schools, etc.), the interior surface of the walls and ceilings of habitable rooms (excluding those separated by floors and walls of quasi-fireproof construction, or fire preventive equipment specified in Article 2 item (9-2) (b) of the Law with a construction specified by Article 112 paragraph 14 item (2) at every 100 sq m or less and not for use shown in Column (A) of Annexed Table 1 of the Law, and provided in parts of fireproof buildings or quasi-fireproof buildings coming under Article 2 item (9-3) (a) of the Law at a height of 31 m or less) shall be finished as specified in paragraph 1 item (1), and the interior surface of the walls and ceilings of principal corridors, stairs or other passageways leading from the said habitable rooms to the ground shall be finished as specified in paragraph 1 item (2). Provided, that this shall not apply to those parts of special buildings for use as mentioned in paragraph (2) of column (A) of Annexed Table 1 of the Law which are at a height of 31 m or less.

5. In buildings having habitable rooms specified in Article 128-3-2, the interior surface of the walls and ceilings of the said habitable rooms and of principal corridors, stairs or other passageways leading from the said habitable rooms to the ground shall be finished as specified in paragraph 1 item (2).

6. The interior surface of the walls and ceilings of cooking rooms, etc. subject to interior restrictions shall be finished as specified in paragraph 1 item (2).

7. Omitted.

CHAPTER V-2-2 Verification of Evacuation Safety

(Application of Standards to Floors of a Building for which a Safe Floor Evacuation Verification is Performed)

Article 129-2. The provisions of Article 119, Article 120, Article 123 paragraph 3 item (1), item (9) (limited to parts of entrances and exists linking habitable rooms with balconies or attached rooms), and item (11), Article 124 paragraph 1 item (2), Article 126-2, Article 126-3, and Article 129 (excluding parts covered by provisions of paragraphs, 2, 6, and 7 and part of stairways) shall not apply to floors (in buildings provided for use as stores selling products, including floors and rooftop plaza, same in this article and the following article) of buildings (limited to buildings whose principal building parts are quasi-fireproof construction or are made of noncombustible materials) which have been confirmed by a safe floor evacuation verification method to provide safe floor evacuation performance or have been approved by the Minister of construction as floors that provide safe floor evacuation performance.

2. “Safe floor evacuation” in the preceding paragraph shall mean that when a fire has started in any habitable room (excluding habitable rooms which have been specified by the Minister of Construction as rooms where there is little danger of a fire starting. In this article and the following article, referred to as “fire rooms”) of the said floor, during the time period until all people (including people who cannot evacuate without moving through the said floor. In this article and the following article, referred to as “people in the floor”) on the said floor have completed evacuation from the said floor to one through stairway (limited to evacuation stairs and stairs linked to ground level, and in the case of evacuation stairs, ground level; same in the remainder of this article), smoke or gas does not descend to a level that is detrimental for evacuation in any room of the said floor, in principal corridors or other parts of the building linking any habitable room with the through stairs.

3. “Safe floor evacuation verification method” in paragraph 1 means a method of verifying in accordance with the provisions of the following items, that evacuation from the floors of a said building can be performed safely when a fire starts.

(1) For each habitable room on the said floor, the time required for all people in the said habitable room (including people who cannot evacuate without moving through the said room. In the remainder of this item, referred to as “people in the room”) to complete evacuation from the said habitable room after a fire starts in the said habitable room shall be calculated by obtaining the aggregate of times specified in items (a) to (b) below.

(a) Time required after a fire starts for people in a habitable room to begin evacuation calculated by a method specified by the Minister of Construction according to the aggregate of floor areas of the said habitable room and parts of the building from which people cannot evacuate without passing through the said habitable room (unit: minute)

(b) Walking time required for people in a habitable room to move from each part of the said habitable room to the one of the exits from the said habitable room calculated by a method specified by the Minister of Construction according to the use of the habitable rooms on the said floor and the walking distance to one of the exits (limited to an exit from the said habitable room to principal corridors or other passageways leading to through stairs, same in the remainder of this item) of the said habitable room from each part of the habitable room on the said floor (unit: minute)

(c) Time required for people in a habitable room to pass through the exit from the said habitable room calculated by a method specified by the Minister of Construction according to the use and floor surface area of the habitable rooms on the said floor and width of the exit (limited to exits leading to an exit of the said habitable room) of each habitable room of the said floor (unit: minute)

(2) For each habitable room in the said floor, the time required for gas or smoke produced by a fire started in the said habitable room to descend to a level detrimental for evacuation shall be calculated by a method specified by the Minister of Construction according to the use, the floor surface area, and ceiling height of the said habitable room, the construction of the smoke exhaust equipment in the said habitable room, and the types of materials used to finish the ceilings and walls of the said habitable room.

(3) It shall be confirmed that the time calculated according to the provisions of item (1) regarding each habitable room of the said floor shall not exceed the time calculated according to the provisions of the preceding item.

(4) For each fire room of the said floor, the time required for all people on the floor to complete evacuation from the said floor after a fire starts in the said fire room shall be calculated by obtaining the aggregate of times specified in items (a) to (b) below.

(a) Time required after a fire starts for people on the floor to begin evacuation calculated by a method specified by the Minister of Construction according to the use and the aggregate of floor areas of the habitable rooms of the said floor and in parts of the building from which people cannot evacuate without passing through the said floor (unit: minute)

(b) Walking time required for people in a floor to move from each part of the said floor to one of the through stairs calculated by a method specified by the Minister of Construction according to the use of the habitable rooms on the said floor (including parts of the building which cannot be evacuated without passing through the said floor; same in the remainder of this item) and the walking distance to one of the exits to the through stairs from each part of each habitable room on the said floor (unit: minute)

(c) Time required for people in a floor to pass through the exit from the said floor to a through stairs calculated by a method specified by the Minister of Construction according to the use and floor surface area of the habitable rooms on the said floor and width of the exit (limited to those leading to an exit to through stairs) of each habitable room of the said floor (unit: minute)

(5) For each fire room in the said floor, the time required for gas or smoke produced by a fire started in the said fire room to descend to a level detrimental for evacuation in principal corridors and other parts of the building leading to through stairs from habitable rooms of the said floor (excluding the said fire room) and from the said habitable room shall be calculated by a method specified by the Minister of Construction according to the use, the floor surface area, and ceiling height of the habitable rooms on the said floor, the construction of the walls and of openings in the walls of the habitable rooms, the construction of the smoke exhaust equipment in the habitable rooms, and the types of materials used to finish the ceilings and walls of the habitable rooms.

(6) It shall be confirmed that the time calculated according to the provisions of item (4) regarding each fire room of the said floor shall not exceed the time calculated according to the provisions of the preceding item.

(Application of Standards to a Building for which a Safe Evacuation Verification is Performed)

Article 129-2-2. The provisions of Article 112 paragraphs 5, 9, 12, and 13, Article 119, Article 120, Article 123 paragraph 1 items (1) and (6), paragraph 2 item (2), paragraph 3 items (1), (2), (9) and (11), Article 124 paragraph 1, Article 125 paragraphs 1 and 3, Article 126-2, Article 126-3, and Article 129 (excluding parts covered by provisions of paragraphs, 2, 6, and 7 and part of stairways) shall not apply to buildings (limited to buildings whose principal building parts are quasi-fireproof construction or are made of noncombustible materials) which have been confirmed by a safe building evacuation verification method to provide safe evacuation from the entire building or have been approved by the Minister of construction as a building that provides safe evacuation from the entire building.

2. “Safe building evacuation” in the preceding paragraph shall mean that when a fire has started in any fire room of the said building, during the time period until all people in the said building (in the remainder of this article, referred to as “building inhabitants”) have completed evacuation from the said building to the ground, smoke or gas does not descend to a level that is detrimental for evacuation in any habitable room of the said building and in principal corridors, stairways or other parts of the building linking any habitable room with the ground.

3. “Safe building evacuation verification method” in paragraph 1 means a method of verifying in accordance with the provisions of the following item, that evacuation from the said building can be performed safely when a fire starts.

(1) It shall be confirmed by the safe floor evacuation verification method specified in paragraph 3 of the preceding paragraph that each floor has the safe floor evacuation performance specified in paragraph 2 of the same article.

(2) For each fire room of each floor of the said building, the time required for all inhabitants of the building to complete evacuation from the said building after a fire starts in the said fire room shall be calculated by obtaining the aggregate of times specified in items (a) to (b) below.

(a) Time required after a fire starts for inhabitants of the building to begin evacuation calculated by a method specified by the Minister of Construction according to the use and the aggregate of floor areas of the habitable rooms of the said building (unit: minute)

(b) Walking time required for the inhabitants of the building to move from each part of the said building to the ground calculated by a method specified by the Minister of Construction according to the use of the habitable rooms in the said building and the walking distance from each part of each habitable room of the said building to one of the exits to the ground (unit: minute)

(c) Time required for inhabitants of the building to pass through the exit from the said building to the ground calculated by a method specified by the Minister of Construction according to the use and floor surface area of the habitable rooms in the said building and width of the exit (limited to those leading to an exit to the ground) of each habitable room of the said building (unit: minute)

(3) For each fire room in each floor of the said building, the time required for gas or smoke produced by a fire started in the said fire room to flow into part of a stairway or into floors higher than the said floor shall be calculated by a method specified by the Minister of Construction according to the use, the floor surface area, and ceiling height of the habitable rooms on the said

floor, the construction of the walls and of openings in the walls of the habitable rooms, the construction of the smoke exhaust equipment in the habitable rooms, the types of materials used to finish the ceilings and walls of the habitable rooms, and the construction of the walls separating the stairways from the said floor and of the openings in the said walls

(4) It shall be confirmed that the time calculated according to the provisions of item (2) regarding each floor of the said building shall not exceed the time calculated according to the provisions of the preceding item.

(Technical Standards, etc. for Large-scale Buildings with Principal Building Parts Made of Wooden Construction)

Article 129-2-3. The technical standards established by Cabinet Order under Article 21 paragraph 1 of the Law shall be those mentioned in either of the following items:

(1) Standards mentioned in the following items (a) to (c):

(a) Omitted.

(b) Principal building parts are either quasi-fireproof construction (limited to walls, columns, floors, beams, and soffits of roofs that conform to the technical standards mentioned in Article 115-2-2 paragraph 1 item (1)).

(c) Passageways at least 3 m wide (limited to those which lead to roadways in contact with the site) shall be provided around the building (excluding portions of the building facing the roadways). Provided, that this shall not apply in cases that conform to the following standards:

[1] Omitted.

[2] In cases where there is a danger of fire spreading from an opening in an external wall to an opening in the story above the story where the said opening is located, a pent roof or equivalent structure which is constructed as specified in the provisions of Article 115-2-2 paragraph 1 item (4) (c) shall be installed above the said opening in the external wall so that it effectively prevents the spread of fire.

(2) Standards mentioned in Article 46 paragraph 2 item (1) (a) and (b) and each item of Article 115-2 paragraph 1 (excluding items (1) and (3)).

2. Omitted.

Clause 1 Reinforcement of the Construction of Building Equipment

(Reinforcement of the Construction of Building Equipment)

Article 129-2-4. The construction of building equipment (excluding elevators) shall be a construction method specified by the Minister of construction as one that is safe from the viewpoint of structural strength.

(Buildings Which Need Not be Provided with Elevatory Equipment for Emergency Use)

Article 129-13. Buildings as specified by Cabinet Order under Article 34 paragraph 2 of the Law shall be those coming under either of the following items:

(1)~(2) Omitted.

(3) Buildings whose parts exceeding 31 m in height consist of four or fewer stories and whose principal building parts are of fireproof construction, in which the said parts exceeding 31 m in height are separated by floors and walls of fireproof construction and by special fire preventive equipment that is constructed as specified in Article 112 paragraph 14 item (1) (including fire preventive equipment specified in Article 2 item (9-2) (b) of the Law provided in those windows which face corridors and have an opening area of 1 sq m or less) to limit the aggregate of floor areas of each separation to 100 sq m or less.

(4) Omitted.

(Installation and Construction of Elevatory Equipment for Emergency Use)

Article 129-13-2. Elevatory equipment for emergency use as mentioned in Article 34 paragraph 2 of the Law shall be elevators, and the installation and construction of the said elevators shall be as described in this Article, in addition to following the provisions of Articles 129-4 through 129-10-2.

2. Omitted.

3. Passenger lobbies shall be constructed as described in each of the following items:

(1) Passenger lobbies shall be connected to the inside of buildings on each floor (excluding evacuation floors and floors specified by the Minister of Construction as floors that are not detrimental for evacuation or fire fighting regardless of the fact that emergency elevators do not serve the said floors).

(2) Omitted.

(3) Entrances/exits (excluding those leading to staircases of special escape stairs and those of hoistways) shall be provided with special fire preventive equipment of such construction as specified in Article 123 paragraph 1 item (6).

(4)~(9) Omitted.

4.~12. Omitted.

(Construction)

Article 129-15. Lightning conductors as mentioned in the preceding Article shall conform to the standards in the following items.

(1) Lightning conductors shall be constructed by a method specified by the Minister of Construction or a method approved by the Minister of Construction as such that the lightning

conductor can carry the electric current generated by a lightning strike safely to the ground without damaging the building.

(2) Lightning conductors that are in danger of corrosion by rainwater etc. shall be made of a material resistant to corrosion or shall be protected by an effective corrosion prevention method.

CHAPTER VII-2 BUILDINGS IN FIRE PROTECTION DISTRICTS OR QUASI-FIRE PROTECTION DISTRICTS

(Technical Standards for Buildings Having Three Stories Excluding Basement Levels)

Article 136-2. The technical standards established by Cabinet Order under Article 62 paragraph 1 of the Law shall be as follows:

- (1) The openings in external walls (excluding those which face open space or water areas such as parks, public squares, rivers or the like effective in fire prevention, or walls of fireproof construction and the like; the same in this Article), which face the boundary line of an adjacent land lot or the center line (referred to as “boundary line with the adjacent land lot, etc.” hereinafter in this Article) between external walls of the building concerned and other buildings on the same site (excluding the other buildings concerned in cases where the aggregate of total floor areas of the buildings on the same site is 500 sq m or less), whose horizontal distance from the boundary line with the adjacent land lot, etc. concerned is 1 m or less shall be provided with fire preventive equipment specified by Article 2 item (9-2) (b) of the Law with a construction specified in Article 112 paragraph 14 item (1) or by fixed sash windows that are fire protective equipment specified by Article 2 item (9-2) (b) of the Law. Provided, that this shall not apply in cases where the size of ventilation openings or windows for ventilation installed in rooms other than habitable rooms (excluding rooms provided with kitchen ranges, cooking stoves and other fire-using equipment or apparatus) is less than 0.2 sq m.
- (2) Omitted.
- (3) External walls shall be of fire preventive construction and their construction shall be construction specified by the Minister of Construction as construction that effectively blocks heat and flames from the inside at the time of a normal fire.
- (4) Soffits shall be of fire preventive construction.
- (5) Columns and beams constituting principal building parts and other parts of buildings designated by the Minister of Construction shall be of construction specified by the Minister of Construction as construction such that the whole building is not collapsed easily by normal fires.
- (6) Floors (excluding those of the lowest floor) or ceilings directly below shall be of construction specified by the Minister of Construction as construction as that which effectively prevents the upward spread of fire resulting from the heat below at a time of normal fires.
- (7) The construction of roofs or ceilings directly below roofs shall be of construction specified by the Minister of Construction as construction as that which effectively blocks flames and

heat from inside at a time of normal fires according to the standards established by the Minister of Construction.

(8) Omitted.

(Technical Standards for the Performance of Roofs of Buildings in Fire Protection Districts or Quasi-Fire Protection Districts)

Article 136-2-2. Technical standards specified by Cabinet Order under Article 63 of the Law shall be as mentioned in the following items (in the case of the roof of a building or part of a building provided for use as a warehouse to store noncombustible products or similar use as specified by the Minister of Construction and whose principal building parts other than the roof are made of quasi-noncombustible materials, item 1).

(1) The roof will be such that embers from a normal fire on the street will not ignite the roof harming its fire prevention performance.

(2) The roof will be such embers from a normal fire on the street will not melt, crack, or otherwise damage the roof harming its capacity to prevent fire from spreading to the interior of the building.

(Technical Standards for Quasi-Flame Blocking Performance)

Article 136-2-3. Technical standards specified by Cabinet Order under Article 64 of the Law shall be such that when fire preventive equipment is heated by the heat of a normal fire occurring around a building the fire does not spread to the surface (limited to surfaces facing the interior) other than the surface that is heated for 20 minutes after heating begins.

(Restrictions by Ordinances in Areas of District Planning, etc.)

Article 136-2-4. Omitted.

(Site Area of Buildings Eligible for Relaxation of Height Restrictions in District Planning Areas to Promote Intensive Use of Residential Land)

Article 136-2-5. Omitted.

(Standards for Designation of Planned Roads)

Article 136-2-6. Omitted.

(Persons Having Interests Whose Consent Is Necessary for Designation of Planned Roads)

Article 136-2-7. Omitted.

(Restrictions for Buildings in Areas Other than City Planning Areas)

Article 136-2-8. Omitted.

CHAPTER VII-5 Type Approval