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**Metal components for balcony and
handrails of dwellings**

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Metal components for balcony and handrails of dwellings

1 Scope This Japanese Industrial Standard specifies metal components for balcony (hereafter referred to as “balcony”⁽¹⁾) and those for handrails (hereafter referred to as “handrail”⁽²⁾) to be used for dwellings.

Notes ⁽¹⁾ The balcony means the outdoor floor extending from the outer wall of building except the floor parts.

Informative reference: For the floor parts of balcony, JIS A 5721 shall apply.

⁽²⁾ The handrail means the safety fence constructed for the dwelling.

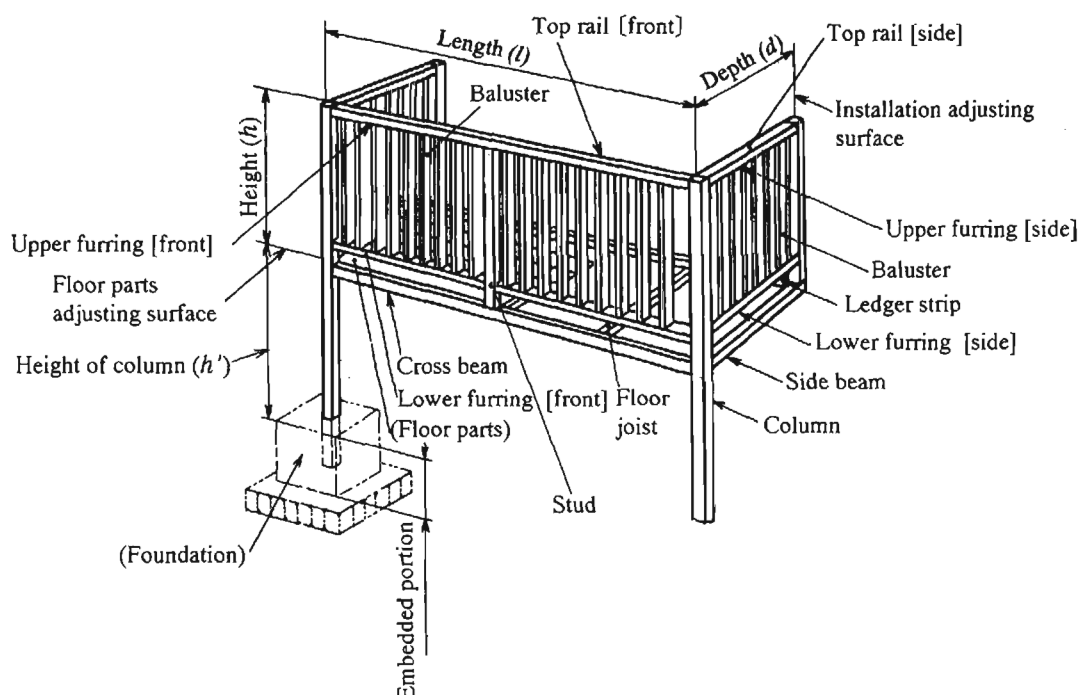
Remarks 1 The foundation is not included in this Standard.

2 The standards cited in this Standard are shown in Attached Table 1.

3 The units and numerical values given in { } in this Standard are based on the traditional units and are appended for informative reference only.

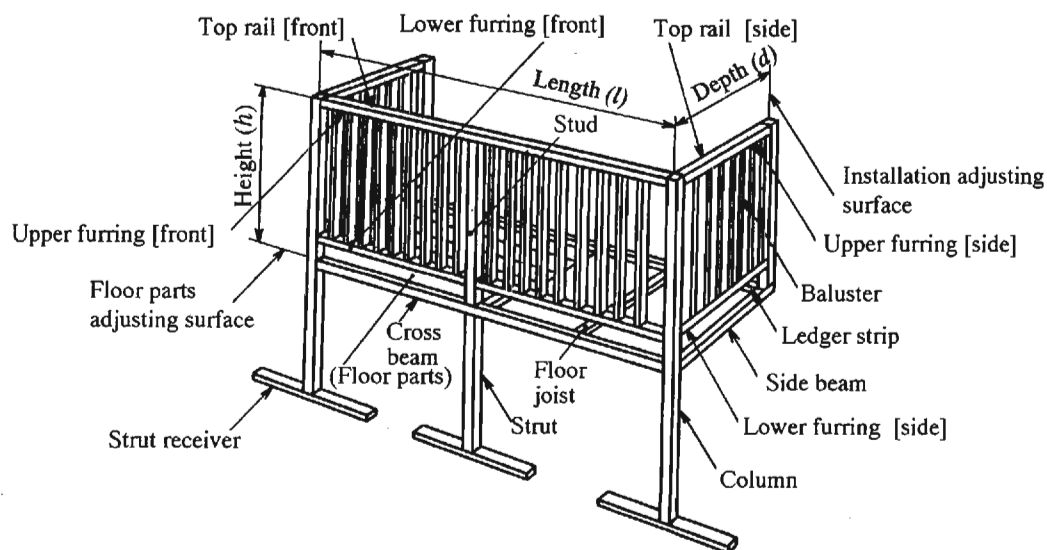
2 Name of each part The name of each part of balcony and handrail shall be as given in Fig. 1 and Fig. 2.

The shape in the figure shows one example.

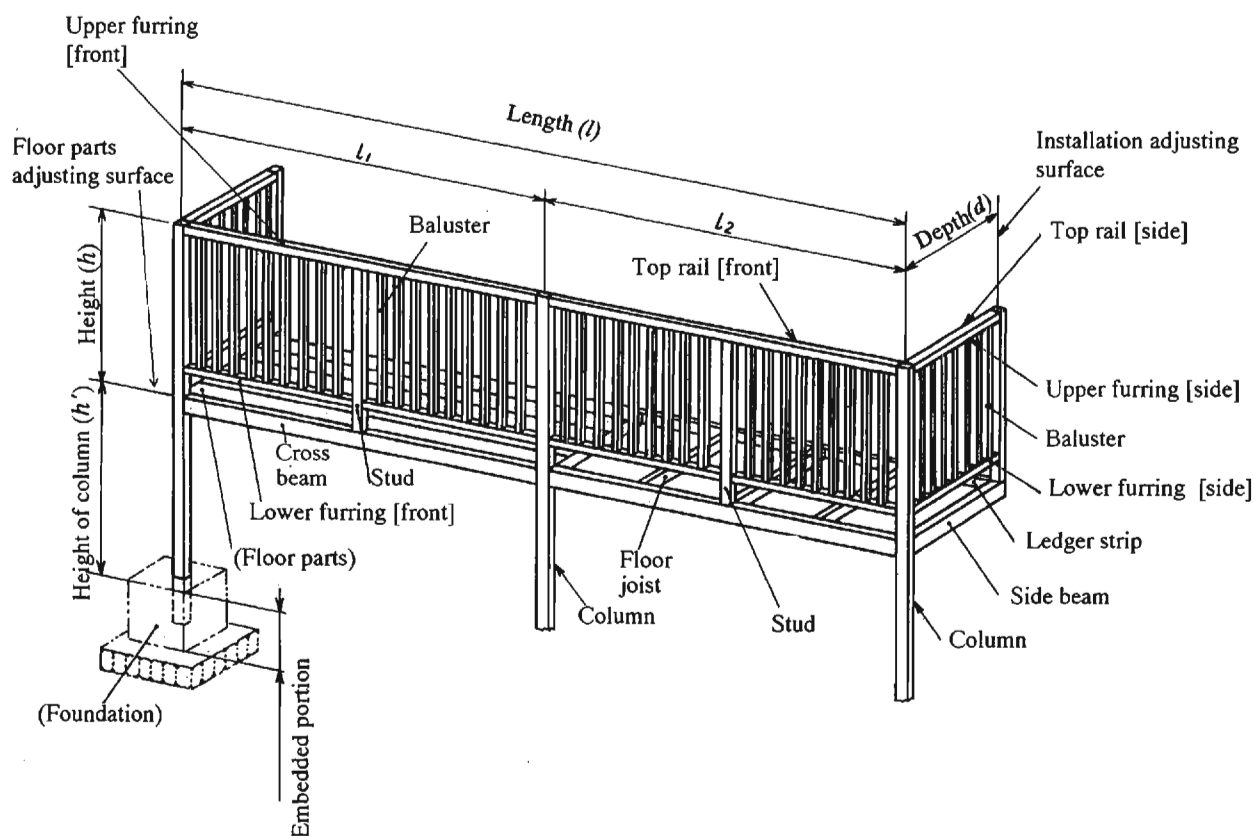


(a) Balcony (column built type) single body

Fig. 1 (example)



(b) Balcony (on-the-roof type) single body



(c) Balcony (column built type) connecting type

Remarks : l_1 and l_2 mean the length of the respective balconies to be connected.

Fig. 1 (continued)

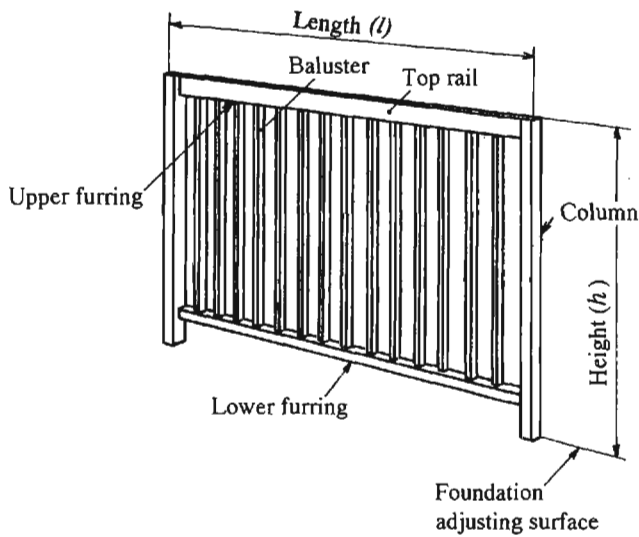


Fig. 2 Handrail (example)

3 Classification Balconies and handrails shall be classified according to the material and setting method of balcony or strength of handrail as follows :

(1) **Classification by material** The classification by material of balcony and handrail is as shown in Table 1.

Table 1 Classification by material

Class	Material
A	Made of aluminium alloy
S	Made of steel
SU	Made of stainless steel

(2) **Classification by setting method of balcony** The classification by setting method of balcony is as given in Table 2.

Table 2 Classification by setting method

Class	Setting method
P	The column built type whose column is fixed on the ground
R	The on-the-roof type to be installed by placing strut receivers on the roof.

(3) **Classification by strength of handrail** The classification by strength of handrail is as given in Table 3.

Table 3 Classification by strength

Class	Strength	Remarks
L	Performance of L in Table 5	Handrail to be used mainly for a detached house.
M	Performance of M in Table 5	Handrail to be used mainly for non - common use part of apartment house.
H	Performance of H in Table 5	Handrail to be used mainly for common use part and non - common use part of apartment house.

4 Performance The performance of balcony and handrail shall conform to Table 4 for balcony and to Table 5 for handrail when tested in accordance with Clause 9.

Table 4 Performance of balcony

Test item				Performance	Test clause to be applied	
Strength	Vertical load test		Floor (floor joist)	The maximum deflection quantity is $\frac{l}{500}$, the maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 3 mm, and loosening or out of joint does not exist.	9.1.2	
			Top rail [front]	The maximum deflection quantity is $\frac{l}{500}$, the maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 3 mm, and loosening or out of joint does not exist.	9.1.3	
	Horizontal load test on top rail [front]			The maximum deflection quantity is $\frac{l}{120}$, but in the case of connecting type $\frac{L}{120}$, the maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 3 mm, but in the case of connecting type, $\frac{L}{1000}$, besides the maximum value 5 mm, and loosening or out of joint does not exist.	9.1.4	
	Impact test		Top rail [front]	To be free from breakage of component, and loosening or out of joint of joint part.	9.1.5 (1)	
			Baluster	To be free from breakage of component, and loosening or out of joint of joint part.	9.1.5 (2)	
Durability	Made of steel, or stainless steel	Accelerated weathering test	Gloss retention	80% or over	9.3.2	
			Discoloration	To be free from remarkable discoloration.		
		Salt spray test			To be free from red rust and lifting or peeling of paint film.	9.3.3
		Alkali resistance test			The rating number to be 9.5 or over in 48 hours.	9.3.4
	Made of aluminium alloy	Accelerated weathering test	Gloss retention	75% or over	9.3.2	
			Discoloration	To be free from remarkable discoloration.		
		Alkali resistance test			The rating number to be 9.5 or over in 16 hours.	9.3.4

Table 5 Performance of handrail

Test item				Performance			Test clause to be applied
				L	M	H	
Strength	Vertical load test on top rail			Maximum deflection quantity is $\frac{l}{120}$, maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 3 mm, and loosening or out of joint does not exist.	Maximum deflection quantity is $\frac{l}{250}$, maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 2 mm, and loosening or out of joint does not exist.	Maximum deflection quantity is $\frac{l}{500}$, maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 1 mm, and loosening or out of joint does not exist.	9.2.2
	Horizontal load test on top rail			Maximum deflection quantity is $\frac{l}{120}$, maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 3 mm, and loosening or out of joint does not exist.	Maximum deflection quantity is $\frac{l}{120}$, maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 2 mm, and loosening or out of joint does not exist.	Maximum deflection quantity is $\frac{l}{500}$, maximum residual deflection quantity $\frac{l}{1000}$, besides the maximum value 1 mm, and loosening or out of joint does not exist.	9.2.3
	Impact test		Top rail [front]	To be free from breakage of component, and loosening or out of joint of joint part.			9.2.4
Baluster							
Durability	Made of steel, or stainless steel	Accelerated weathering test	Gloss retention	80% or over			9.3.2
			Discoloration	To be free from remarkable discoloration.			
		Salt spray test		To be free from red rust and lifting or peeling of paint film.			9.3.3
		Alkali resistance test		The rating number to be 9.5 or over in 48 hours.			9.3.4
	Made of aluminium alloy	Accelerated weathering test	Gloss retention	75% or over			9.3.2
			Discoloration	To be free from remarkable discoloration.			
Alkali resistance test		The rating number to be 9.5 or over in 16 hours.			9.3.4		

5 Structure and working The structure and working of balcony and handrail shall be as follows :

- (1) Each part of the balcony and the handrail shall be of the structure capable of being firmly connected so as not to cause the looseness by welding, bolt fastening or other method.
- (2) The connecting surface of face side shall be finished smoothly.
- (3) The balcony and handrail shall be of such structure that the endurance and prevention from deformation are taken into consideration.
- (4) The floor part receiver (floor joist and the like) shall be such structure by taking the shape, strength, etc. of floor parts into consideration that the flexure, loosening, etc. of floor parts are not generated.
- (5) All the internal intervals between balusters, between top rail and upper furring, between cross beam and lower furring, and so on shall not be wide enough to make the ball of 110 mm in diameter pass through.

Moreover, there shall be no member materials which may be served as footstool and the like in the range of the height 200 mm to 800 mm from the floor parts adjusting surface or the foundation adjusting surface.

- (6) The distance between the floor joists shall be not more than 450 mm measured on center to center basis.
- (7) The balcony shall not be of structure detrimental to use even if the deformation, shrinkage, etc. are caused by the change of temperature of floor parts.
- (8) When using the materials of aluminium alloy, they shall be of surface treated, specified in Table 4 or Table 5 or those equivalent or superior thereto.

However, when elongated members of aluminium alloy with combined coating are used, they shall be of surface treatment classification B or P specified in JIS H 8602.

- (9) The balcony, in the case of being used in combination with the metal roof components for terrace specified in JIS A 6602, shall be of structure capable of being connected tightly.
- (10) Steel to be used for the balcony and the handrail shall be 1.6 mm or more in nominal thickness for the main members such as columns and cross beams, and 1.2 mm or more in nominal thickness for balusters or other members. This requirement is not applied to the stainless steel (SUS304 or equivalent or superior thereto).

6 Dimensions

6.1 Dimensions of balcony The dimensions of the balcony shall be as follows.

- (1) **Modular nominal dimensions of balcony** Modular nominal dimensions of length (l)(³), depth (d)(³) and height (h)(³) of balcony shall be as given in Table 6. However, in the case where columns are used to support the length direction, connection of two of the length (l), that is length (L) specified in Table 6 is allowed.

Note (³) The length (l) means the dimension from center to center of column of balcony.

The depth (d) means the dimension from the installation adjusting surface with the building to center of column as shown in Fig. 3.

The height (h) means the dimension from the floor parts adjusting surface up to upper end of top rail as shown in Fig. 3.

Table 6 Modular nominal dimensions of balcony

Unit : mm

Length (l)	1800, 1900, 2000, 2100, 2700, 2900, 3000, 3600, 3900, 4500, 4600, 4800, 5000
Depth (d)	900, 1100, 1200, 1500, 1800
Height (h)	1100, 1200

Remarks : The dimensions not specified for the length (l) and the depth (d) shall be subjected to the agreement between the parties concerned with delivery.