

JIS

JAPANESE INDUSTRIAL STANDARD

Tubular Steel Scaffolds

 JIS A 8951 —1985

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Tubular Steel Scaffolds

A 8951-1985

1. Scope

This Japanese Industrial Standard specifies the tubular steel scaffolds used for building works.

Remark: The units and numerical values given in { } in this standard are in accordance with the International System of Units (SI), and are appended for reference.

2. Classification

The tubular steel scaffolds shall be classified into tube and coupler scaffolding and prefabricated scaffolding.

- (1) Tube and Coupler Scaffolding It means the location scaffolding where steel pipes are assembled using clamps in a building site.
- (2) Prefabricated Scaffolding It means the location scaffolding where vertical frames prefabricated using steel pipes as principal member and other members are assembled in a building site.

3. Names of Respective Parts

3.1 Tube and Coupler Scaffolding The names of respective parts of tube and coupler scaffolding shall be as follows (refer to Fig. 1).

- (1) Upright post
- (2) Ledger
- (3) Bracket
- (4) Ridge directional brace
- (5) Lateral bracing
- (6) Wall binding metal fittings
- (7) Accessory metals

Applicable Standards and Reference Standards: See page 38.



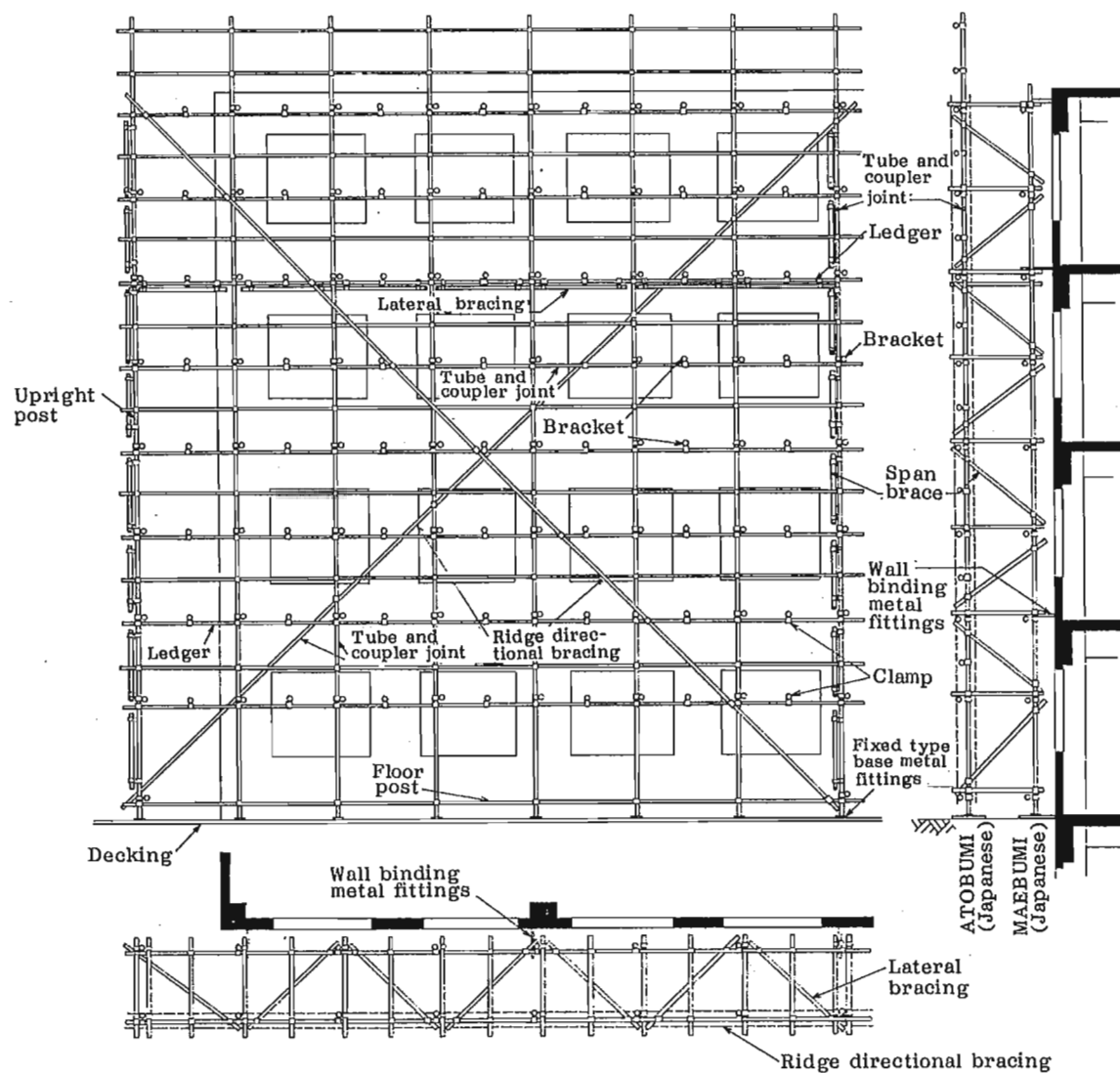
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- (8) Decking
- (9) MAEBUMI (Japanese) (Inner upright post for exterior main scaffolding)
- (10) ATOBUMI (Japanese) (Outer upright post for exterior main scaffolding)

Remark: The accessory metals shall be divided as follows:

- (1) Tube and Coupler Joint It is the joint for jointing two tubes on a straight line.
- (2) Clamp It is the following accessory metals used for tightening tubes intersecting them.
 - (a) Cross Type Metal fittings used for crossing of tubes at right angles.
 - (b) Adjustable Type Metal fittings used for intersecting tubes at optional angles.
- (3) Fixed Type Base Metal Fittings They are metal fittings transmitting the load of upright post to ground by attaching them to the lower end of upright post tube and so constructed as to consist of tenon and baseplate.

Fig. 1



3.2 Prefabricated Scaffolding The names of members of prefabricated scaffolding shall be as follows (refer to Fig. 2):

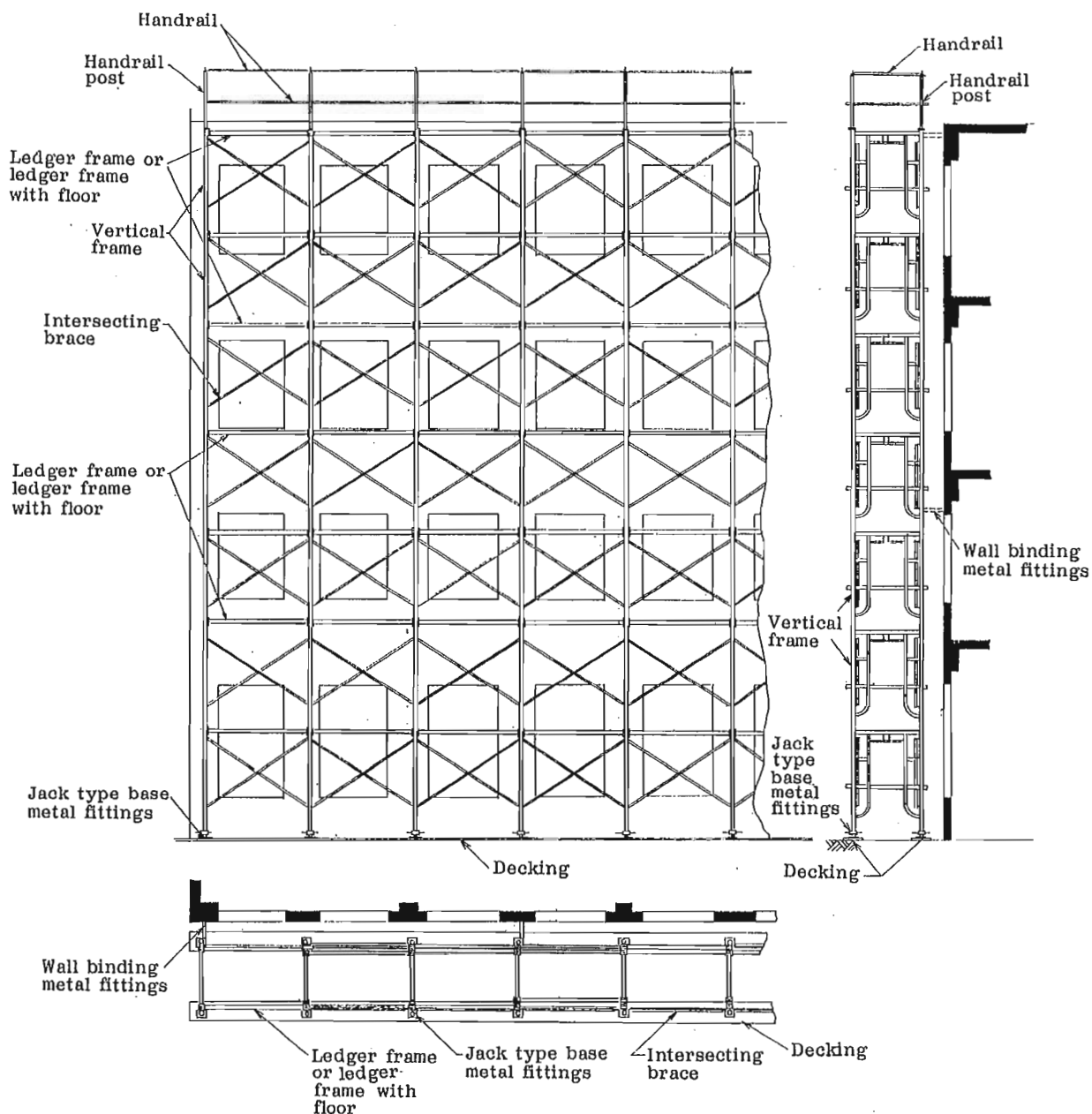
- (1) Vertical Frame
- (2) Ledger Frame
- (3) Ledger Frame with Floor
- (4) Intersecting Brace
- (5) Corbelled Frame

(6) Wall Binding Metal Fittings(7) Accessory Metals

Remark: The accessory metals shall be divided as follows:

- (1) Leg Post Joint
- (2) Arm Lock
- (3) Jack Type Base Metal Fittings
- (4) Clamp

Fig. 2



4. Quality (Material Quality, Dimensions, Strength, Construction, etc.)4.1 Tube and Coupler Scaffolding

4.1.1 Steel Tubes for Tube and Coupler Scaffolding The quality of steel tubes for tube and coupler scaffolding shall be as follows:

- (1) The steel tubes for tube and coupler scaffolding shall conform to STK 51 specified in JIS G 3444 and the dimensions shall be 48.6 mm in outer diameter and 2.5 mm in thickness.
- (2) The steel tubes for tube and coupler scaffolding shall be processed with coating having rustproof effect as follows:
 - (a) The steel tube shall be coated after sufficiently cleaning it by sand-blasting or pickling.
 - (b) The quality of coatings of tube processed with zinc coating shall be Grade 1 HDZA of JIS H 8641 or that superior thereto.

4.1.2 Accessory Metals

- (1) The strength or the like of tube and coupler joint shall conform to Table 1.

Table 1

Item	Sepecification	Test method
Deflection and bending strength	1. The amount of vertical deflection shall be 19 mm max. 2. The maximum load shall be not less than the following values: Mean value 300 kgf{2 942 N} Minimum value 270 kgf{2 647.8 N}	6.1.1 (1)
Elongation and tensile strength	1. The elongation shall be 0.9 mm max. 2. The maximum load shall be not less than the following values: Mean value 1650 kgf{16 181 N} Minimum value 1500 kgf{14 710 N}	6.1.1 (2)
Compressive strength	The maximum load shall be not less than the following values: Mean value 4 200 kgf{41 188 N} Minimum value 3 800 kgf{37 265.1 N}	6.1.1 (3)

(2) The strength of clamp shall conform to Table 2.

Table 2

Item	Specification	Test method
Specification	1. The variation amounts shall respectively be 10 mm max. 2. The maximum load shall be not less than the following values: (Cross type) Mean value 1 600 kgf {15 690 N} Minimum value 1 500 kgf {14 710 N} (Adjustable type) Mean value 1 100 kgf {10 787.3 N} Minimum value 1 000 kgf {9 806.6 N}	6.1.2

(3) The materials of accessory metals shall conform to the requirements specified in Table 3 or shall have mechanical properties equal or superior thereto.

Table 3

Member	Constitutional part	Materials
Tube and coupler joint	Tenon and collar	SGP specified in JIS G 3452
Clamp	Body and cover	SPHD specified in JIS G 3131
	Bolt, nut and pin	SS 34 specified in JIS G 3101
Fixed type base metal fittings	Tenon	SGP specified in JIS G 3452
	Baseplate	SS 34 specified in JIS G 3101

(4) The construction of accessory metals shall be as follows:

- (4.1) The tube and coupler joint shall have collar at the central part of its tenon and conform to the following:
- (a) The thickness of tenon and collar shall be 2.2 mm min.
 - (b) The length of both side parts of collar capable of being inserted into tube and coupler, shall be respectively 95 mm min.
 - (c) It shall have the extraction proof function and said function shall be necessarily confirmed to surely operate.

- (4.2) The clamp shall have body, cover, bolt, nut and pin and further conform to the following:
- (a) The plate thickness of body and cover shall be 3.0 mm min.
 - (b) The diameter of bolt shall be 9.0 mm min. including thread ridge.
- (4.3) The fixed type metal fittings shall have tenon and base plate and further conform to the following:
- (a) The thickness of its tenon shall be 2.2 mm min. and further the length of its part capable of being inserted into tube and coupler shall be 95 mm min.
 - (b) It shall have the extraction proof function.
 - (c) The thickness of base plate shall be 5.4 mm min. and further respective sides thereof shall be square or rectangle of 120 mm min. in side length.
 - (d) The base plate shall have a weep hole and not less than 2 nail holes.

4.2 Prefabricated Scaffolding

4.2.1 Material quality, dimensions and dimensional permissible deviations of members and accessory metals for prefabricated scaffolding. The material quality, dimensions and dimensional permissible deviation of members and accessory metals for prefabricated scaffolding shall conform to Table 4. However, as for material quality, those having mechanical properties equal or superior to this standard may be accepted.

Table 4

Member	Constitutional part	Material quality	Dimension and dimensional permissible deviations (mm)			
			Dimensions		Dimensional permissible deviations	
			Outer diameter	Thickness	Outer diameter	Thickness
Vertical frame	Leg post and horizontal member	STK 51 specified in JIS G 3444	42.7	2.5	± 0.25	± 0.3
	Stiffener	STK 41 specified in JIS G 3444	27.2	2.0	± 0.25	± 0.3
	Intersecting brace pin	SS 41 specified in JIS G 3101	34.0	2.3		
Intersecting brace	Diagonal bracing member	STK 41 specified in JIS G 3444	*			
	Hinge pin	SWRM 20 specified in JIS G 3505 (Low Carbon Steel Wire Rods)	21.7	2.0	± 0.25	± 0.3
	Ledger member	STK 51 specified in JIS G 3444				
Ledger frame	Bracket member	STK 41 specified in JIS G 3444	42.7	2.5	± 0.25	± 0.3
	Gripper metal fittings	SS 41 specified in JIS G 3101	34.0	2.3	± 0.25	± 0.3
	Floor member	SPHC specified in JIS G 3131		*		
Ledger frame with floor	Made of expanded metal	XS 42 specified in JIS G 3351 (Expanded Metals)		*		
	Ledger member and beam member	SPHC specified in JIS G 3131				
	Gripper metal fittings	SS 41 specified in JIS G 3101		*		
Jack type base metal fittings	Box type	SPHC specified in JIS G 3131		3.4		± 0.4
	Threaded bar	SS 34 specified in JIS G 3101				
	Baseplate	SS 34 specified in JIS G 3101		*		
Corbelled frame	Adjust nut	FCMB 32 specified in JIS G 5702 (Blackheart Malleable Iron Castings)				
	Vertical member, lateral member and diagonal member	SGP specified in JIS G 3452 or SS 34 specified in JIS G 3101		*		
	Metal fittings	SS 34 specified in JIS G 3101	*			
Wall binding metal fittings	Parts other than bolt, nut and pin	SPHD specified in JIS G 3131		*		
	Principal member	SGP specified in JIS G 3452 or SS 34 specified in JIS G 3101				
	Gripper metal fittings	SS 34 specified in JIS G 3101				
Leg post joint	Parts other than bolt, nut and pin	SPHD specified in JIS G 3131		*		
	Metal fittings	SS 41 specified in JIS G 3101		*		
	Tenon and collar	SGP specified in JIS G 3452		*		
Arm lock		SS 34 specified in JIS G 3101		3.2		± 0.4

Remark: The dimensions of those marked with * in the column of dimensions are respectively given in text of 4.2.3 (Construction of Member and Accessory Metals).

4.2.2 Dimensions of Vertical Frame The dimensions and dimensional permissible deviations of vertical frame shall conform to Table 5.

Table 5

Unit: mm

Dimensions		Dimensional permissible deviations
Width	Height	
600, 610 750, 762	1600, 1625 1700, 1725 1800	± 1.0
900, 914 1200, 1219	1600, 1625 1700, 1725 1900, 1925 1955, 2000	

Remarks 1. The width herein means the distance between the centers of both leg posts at the upper end of leg post.

2. The height herein means the length including the dimension of collar of leg post joint.

4.2.3 Construction of Members and Accessory Metals The construction of members and accessory metals shall be as follows:

- (1) Vertical Frame The vertical frame shall be prepared by welding leg post, horizontal member and stiffener, having intersecting brace, and further shall conform to the following:
 - (a) The intersecting brace pin shall be 13.0 mm min. in diameter and it shall have the extraction proof function.
 - (b) The vertical fitting interval of intersecting brace pins shall be 1200 mm and over to 1300 mm incl.
 - (c) The attaching position of stiffener shall conform to Table 6.

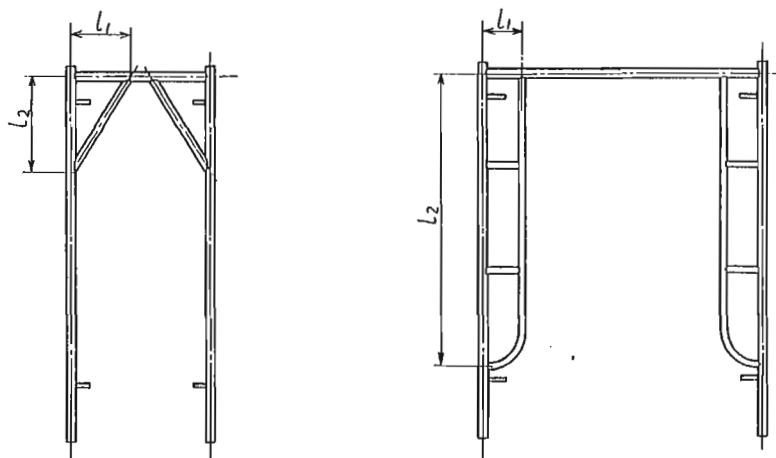
Table 6

Unit: mm

Dimensions	Dimensions	
	ℓ_1	ℓ_2
Vertical frame of 900 min. in width and 1800 max. in height	300 (170 for gate type) min.	1150 min.
Vertical frame of 900 min. in width and over 1800 in height	300 (170 for gate type) min.	1500 min.
Vertical frame of 600 and over to 650 incl. in width and 1800 max. in height	170 (110 for gate type) min.	500 (1150 for gate type) min.
Vertical frame of over 650 to 900 excl. in width and 1800 max. in height	250 (110 for gate type) min.	500 (1150 for gate type) min.

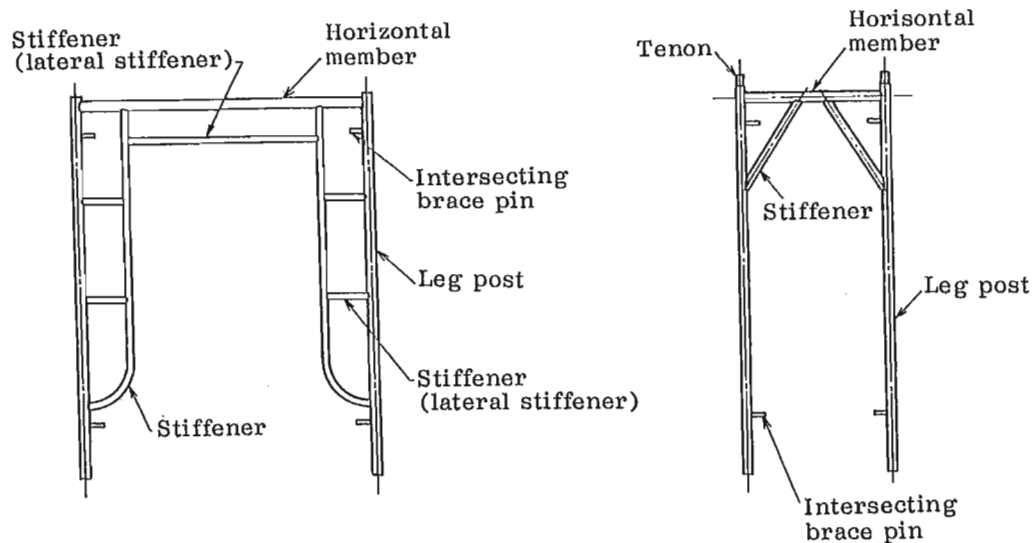
Remarks 1. The ℓ_1 and ℓ_2 in this table mean the dimensions given in (a) of Fig. 3. However, those in vertical frames of gate type mean the dimensions given in (b) of Fig. 3.

Fig. 3



2. The names of constitutional parts shall be in accordance with Fig. 4.

Fig. 4



- (2) Intersecting Brace The intersecting brace shall be prepared by binding two brace members at their central parts by hinge pin and further conform to the following:

- (a) The span and height thereof shall conform to Table 7.

Table 7

Unit: mm

Span	Height
1800	1200
1829	1219

- (b) The brace member shall have pin holes of 15.0 mm max. in diameter at both ends and the distance between the centers of both pin holes shall be 2300 mm max.
- (c) The diameter of hinge pin shall be 6.8 mm min.

Fig. 5

