

Specification for

Aluminium shore gangways

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Foreword

This British Standard has been prepared under the direction of the Shipbuilding and Marine Standards Committee and is based on a proposal of the British Ship Research Association.

Ships require a means of ship to shore access which can be safely used by all persons. The aluminium shore gangway provides a lightweight convenient structure which can be used in a horizontal or inclined position up to an angle of 30° from the horizontal dependent on tidal or freeboard conditions. Special designs of step allow for a more severe angle to be employed than the 30° specified. The gangways described in this standard are not intended to carry wheeled traffic such as loaded trolleys, etc.

A lightweight gangway for "first person ashore" is described in Appendix A.

NOTE Users of this British Standard should note that while observing the requirements of the standard they should at the same time ensure compliance with any statutory requirements, rules and regulations as may be applicable to the individual ship concerned.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the Shipbuilding and Marine Standards Committee, was published under the authority of the Executive Board on 28 April 1978

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1 Scope

This British Standard specifies requirements for three types of aluminium ship to shore gangway which are only for the use of persons to embark or disembark safely.

2 References

This standard makes reference to the following standards publications

BS 729, *Hot dip galvanized coatings on iron and steel articles*.

BS 1161, *Aluminium and aluminium alloy sections*.

BS 1470, *Wrought aluminium and aluminium alloys for general engineering purposes — plate, sheet and strip*.

BS 1473, *Wrought aluminium and aluminium alloys for general engineering purposes — rivet, bolt and screw stock*.

BS 1474, *Wrought aluminium and aluminium alloys for general engineering purposes — bars, extruded round tubes and sections*.

BS 1486, *Lubricating nipples — Part 1: Lubricating nipples and adaptors for use on machinery and vehicles*.

BS 2052, *Ropes made from coir, hemp, manila and sisal*.

BS 2901, *Filler rods and wires for gas-shielded arc welding — Part 4: Aluminium and aluminium alloys and magnesium alloys*.

BS 4360, *Weldable structural steels*.

BS 4928, *Man-made fibre ropes — Part 1: Polypropylene ropes (3-strand hawser laid and 8-strand plaited)*.

BS 4942, *Short link chain for lifting purposes — Part 2: Grade M non-calibrated chain*.

CP 118, *The structural use of aluminium*.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1

gangway

a bridge structure to allow safe embarkation and disembarkation from ship to shore or access to another ship

3.2

side stringers

the longitudinal strength members of the gangway to which the cross-members, stanchions, roller or wheels and the lifting lugs etc. are attached

3.3

cross-members

the bars, angles or hollow sections which hold the side stringers in position, and provide support for the decking

3.4

decking

flat topped corrugated section or plate

3.5

footsteps

the bars, rounded hollow sections or hardwood battens fitted proud of the decking or deck plate level to give better foot grip when the gangway is inclined from the horizontal position

3.6

hand and intermediate guides

the tubes, bars, ropes or chains which protect people from falling from the gangway

3.7

nominal size

the length of the gangway between points of support (see Figure 1, Figure 2 and Figure 3)

4 Types of gangway

Three types of gangway are specified in this standard; they are as follows:

- a) type A, rigid-decking two-handrail gangway (see Figure 1);
- b) type B, hinged two-handrail gangway (see Figure 2);
- c) type C, rigid-narrow-decking two-handrail gangway (see Figure 3 and Appendix A).

NOTE The longer type A gangways with hinged or portable handguides may be made up of sections connected by rigid jointing. For gangways assembled in this way, the preferred number of sections is given in Table 3.

5 Materials

The materials shall comply with the requirements of Table 1. Other materials may be used provided they have equivalent strength and are compatible with the structural use of aluminium as specified in CP 118.

6 Dimensions

6.1 Gangways shall be designed to the nominal sizes shown in Table 2 or Table 3 for types A and B and Table 4 and Table 5 for type C.

6.2 The minimum width between side stringers shall be as indicated in Figure 1, Figure 2 and Figure 3.

7 Design and construction

7.1 Design parameters

7.1.1 Design loading. The assembly, comprising side stringers, cross-members and decking shall be designed to withstand a uniform deck loading of 4 000 N/m².

7.1.2 Factor of safety. The allowable stress used in the design of the gangway with the loading specified in 7.1.1 shall be determined by applying a factor of safety of 2 on the 0.2 % proof stress of aluminium.

7.1.3 Construction. The design and construction shall be in accordance with CP 118.

7.2 Side stringers. Side stringers shall be constructed from welded, extruded hollow or rolled sections, or from plate or from any combination of these.

7.3 Cross-members. Cross-members attached to the side stringers shall be capable of supporting the deck or deck plates.

7.4 Decking. The decking shall comprise either continuous-flat-topped longitudinal corrugated section or individual flat-plate surfaces, which may have a non-slip coating.

7.5 Footsteps. Footsteps of 50 mm × 50 mm hardwood shall be secured to the top of the decking at regular centre to centre intervals of not less than 400 mm. Alternatively, the footsteps may be constructed from extruded aluminium sections secured to the stringers or the decking, and raised above decking level by a minimum of 30 mm, in which case the minimum longitudinal length of flat decking between adjacent footsteps shall be 350 mm.

Table 1 — Materials

Reference ^a	Component	Material	BS number	Remarks
1	Side stringers	Aluminium	BS 1161 BS 1470 BS 1473 BS 1474	H 30 alloy
2	Cross-members	Aluminium	BS 1470 BS 1474	H 30 alloy
3	Decking or deck plates	Aluminium	BS 1470 or BS 1474	H 30 alloy
4	Footsteps	Aluminium, Hardwood	BS 1474	H 30 alloy
5	Rollers Wheels	Carbon steel Carbon steel with solid tyres	BS 4360	Grade 43A Ribbed or flat tread
6	Stanchions	Aluminium Carbon steel	BS 1161 or BS 1474 BS 4360	H 30 alloy Grade 43A
7	Handguides: handrail handrope handchain handwire, plastic coated	Aluminium section Sisal or manila Polypropylene Steel PVC coated guard-wire rope	BS 1474 BS 2052 BS 4928 BS 4942-2	See 7.7 See note to 7.7 a) Galvanized
8	Securing device	Sisal or manila Polypropylene Polypropylene staple fibre	BS 2052 BS 4928-1 BS 4928-1	See note to 7.7 a)
9	Toeboards	Aluminium Hardwood	BS 1474	H 30 alloy

^a The reference numbers in this table refer to parts of Figure 1, Figure 2 and Figure 3.

7.6 Stanchions. Stanchions shall be constructed from carbon steel or aluminium to a height that complies with Figure 1, Figure 2 and Figure 3. They shall be fitted at regular intervals along the gangway, with a maximum permitted interval of 1 500 mm. Stanchions shall be erected vertically with the gangway horizontal and shall be of one of the following types:

- a) fixed;
- b) hinged, with provision made to prevent inadvertent collapse;
- c) portable, with securement to prevent accidental displacement from the socket or base support.

Galvanized stanchions, where specified, shall comply with the requirements of BS 729.

7.7 Hand and intermediate guides. Hand and intermediate guides for the gangway shall be provided which comply with Figure 1, Figure 2 and Figure 3, and shall be of one of the following types.

- a) Continuous and adequately tensioned sisal, manila or polypropylene or plastic covered wire-rope of 16 mm minimum diameter.

NOTE For polypropylene ropes evidence is required from manufacturers that the rope is fully protected against actinic degradation to withstand two years exposure on a ship operating in or through the tropics.

b) Galvanized steel chain provided with adequate means of tensioning.

c) Continuous rigid-aluminium-solid or hollow section for use with fixed or portable stanchions.

d) Continuous rigid-aluminium-solid or hollow section for the handguides of hinged stanchions, with the intermediate guides as in 7.7 a).

7.8 Toeboards. Toeboards, to a height of at least 150 mm above the decking level, shall be fitted at each side of the gangway.

7.9 Roller or wheels. A roller or wheels of 110 mm minimum diameter shall be positioned at one end of the gangway. Rollers or wheels shall be self-lubricated or fitted with a lubricating nipple which complies with the requirements of BS 1486-1, and shall have guards provided for foot protection when the ship moves.

7.10 Securing devices. Suitable attachments shall be provided on both sides of the gangway in order to connect the securing devices (see Figure 1, Figure 2 and Figure 3).

7.11 Lifting lugs. The gangway shall be provided with four lifting lugs securely attached to the stringers and positioned to give an even lift.

7.12 Angle of use. The construction of the gangway shall allow for usage at any angle of inclination from the horizontal plane to 30° from the horizontal.

Table 2 — Nominal sizes and stowage dimensions of types A and B (fixed handguides)

Nominal size	Maximum stowage dimensions of uncrated gangways with fixed handguides, mm					
	Maximum overall length		Maximum overall width		Maximum depth (fixed handguides)	
	Type A	Type B	Type A	Type B	Type A	Type B
3 000	3 750	3 500	650	650	1 400	Made up from two nominal sizes. Use maximum depth dimensions for type A gangway for relevant sections
4 500	5 250	5 000	650	650	1 400	
6 000	6 750	6 600	650	650	1 500	
7 500	8 250	8 100	650	650	1 500	
9 000	9 750	9 600	650	650	1 500	
12 000	12 750	12 600	800	800	1 600	
15 000	15 750	15 600	800	800	1 750	
18 000	18 750	18 600	800	800	1 900	
21 000	21 750	21 600	800	800	2 050	
24 000	24 750	24 600	800	800	2 200	
27 000	27 750	27 600	800	800	2 400	
30 000	30 750	30 600	800	800	2 600	

**Table 3 — Nominal sizes and stowage dimensions of types A and B
(hinged or portable handguides)**

Nominal size	Maximum stowage dimensions of uncrated gangways with hinged or portable handguides, mm						
	Maximum overall length		Maximum overall width		Maximum depth (stanchions removed or folded flat)		
	Type A ^a	Type B	Type A	Type B	Type A	Type B	
3 000	3 750	3 500	650	650	1 section	300	Made up from two nominal sizes. Use maximum depth dimensions for type A gangway for relevant sections
4 500	5 250	5 000	650	650		300	
6 000	6 750	6 600	650	650		350	
7 500	8 250	8 100	650	650	2 sections	350	
9 000	9 750	9 600	650	650		400	
12 000	12 750	12 600	800	800		700	
15 000	15 750	15 600	800	800	3 sections	800	
18 000	18 750	18 600	800	800		900	
21 000	21 750	21 600	800	800		1 000	
24 000	24 750	24 600	800	800		1 100	
27 000	27 750	27 600	800	800		1 200	
30 000	30 750	30 600	800	800		1 300	

^a Stowed lengths may be shorter if rigid-joint extendable gangways are used. The preferred number of sections of type A gangways assembled in this way is shown in column 6.

NOTE If greater angles of inclination are required, the purchaser shall specify the maximum angle to the manufacturer.

b) measurement of initial sag (see Appendix B);

c) preparation for stowage and checking of stowage dimensions.

8 Quality of manufacture

8.1 The assembly, comprising side stringers, cross-members, and decking, together with all ancillary fittings, shall be visibly free from defects and distortion.

8.2 All components shall be free from exposed rough or sharp edges likely to cause injury.

8.3 Preparation, welding, riveting or bolting of aluminium structures shall conform to the recommendations of CP 118, in order that the permissible design stresses are not exceeded. Filler wire for welding shall comply with the requirements of BS 2901-4.

9 Acceptance tests

The following tests shall be carried out at the manufacturer's works.

9.1 Manufacturer's type test. One gangway of each nominal size and type shall be tested in accordance with Appendix B and a test certificate made available to the purchaser on request.

9.2 Individual test. Each gangway shall be fully assembled with all fittings comprising the dead load (i.e. the fully erected gangway) and tested as follows:

- a) lifting by lifting lugs;

10 Marking

Each gangway shall be permanently marked by means of a rating plate prominently displayed. The rating plate shall contain such information as is relevant to the gangway, including the following:

- a) manufacturer's name or trade mark, type number and serial number;
- b) number of this British Standard i.e. BS MA 78;
- c) type of gangway i.e. A, B or C;
- d) nominal size;
- e) maximum permitted angle of use.

11 Inspection

11.1 Gangways subjected to a type test shall be inspected to ensure that there are no signs of residual weakness or damage.

11.2 All gangways shall be visually checked to ensure that:

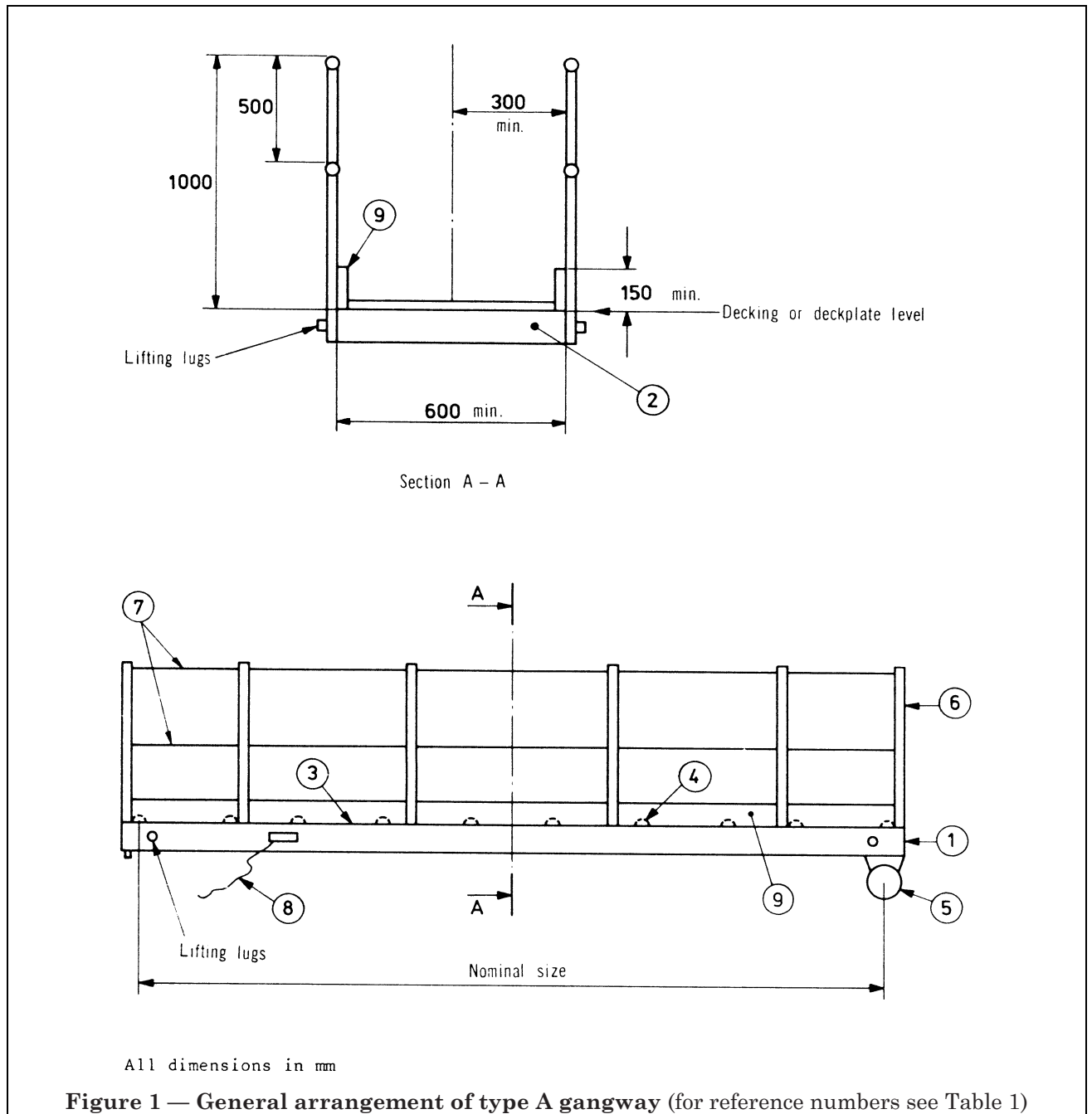
- a) there is no distortion of the side stringers;
- b) the decking or deck plates are adequately secured;
- c) the roller or wheels revolve freely;

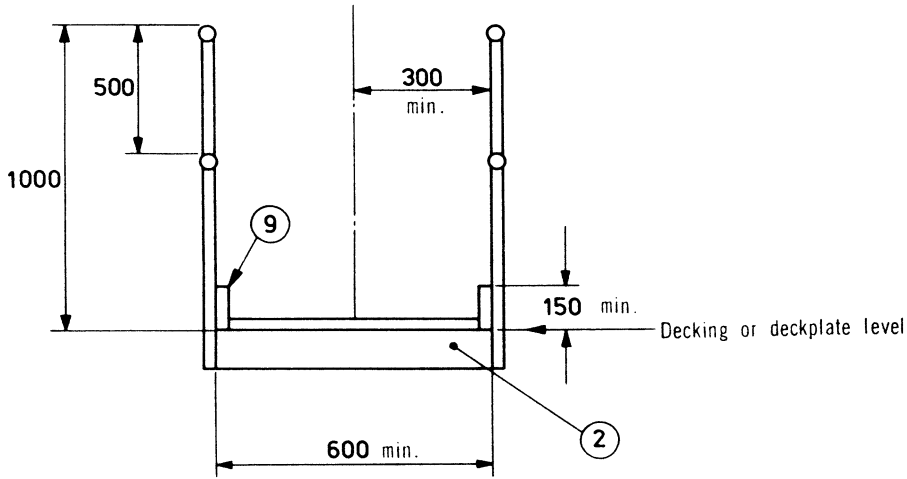
d) if applicable, the stanchions, hand and intermediate guides can be easily erected in position;

e) if applicable, any folding sections can be secured without damage;

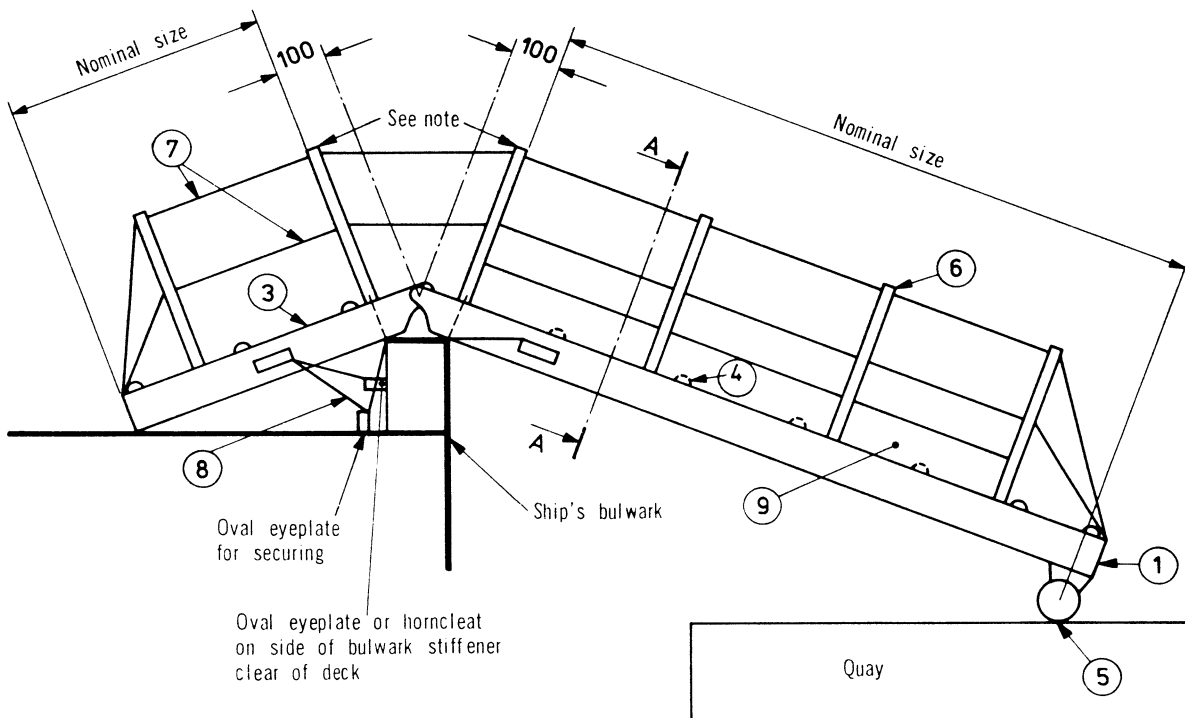
f) removable fittings for rigid joints are identified and properly stowed when the gangway is dismantled;

g) rating plate is affixed and correct.





Section A - A



All dimensions in mm

NOTE Height of bulwark end stanchions to give minimum height to handguide of 1 000 mm.

Figure 2 — General arrangement of type B gangway (for reference numbers see Table 1)

12 Preparation for despatch

12.1 Gangways shall be prepared for despatch with suitable protection to prevent damage in transit. Loose gear shall be well secured or packed in separate crates or boxes. The gangway shall be clearly marked with the manufacturer's and purchaser's reference number or other identification.

12.2 Any special packing requirements for the gangway shall be specified by the purchaser.

13 Information to be supplied by the purchaser

At the time of the enquiry or order the purchaser shall provide the manufacturer with the following information:

- a) gangway to BS MA 78;
- b) type of gangway (see clause 4);
- c) nominal size (see Table 2 and Table 3 and Table 4 and Table 5 in Appendix A.
- d) for a type A gangway, statement of preference for number of sections (see note under Table 3);
- e) type of stanchions required (see 7.6);

- f) type of hand and intermediate guides required (see 7.7);
- g) whether to be fitted with rollers or wheels (see 7.9);
- h) desired length of securing devices (see 7.10);
- i) angle of inclination, if over 30° (see note under 7.12);
- j) whether a test certificate is required (see clause 9);
- k) if additional tests are to be performed;
- l) any special stowage requirements for gangway fittings;
- m) any special protection required for despatch (see 12.2).

14 Information to be supplied by the manufacturer

When specified by the purchaser, the manufacturer shall supply the following information at the tendering stage:

- a) arrangement drawing of gangway with principal dimensions and attachment details;
- b) mass of gangway.

Appendix A Rigid narrow decking, two handrail gangway

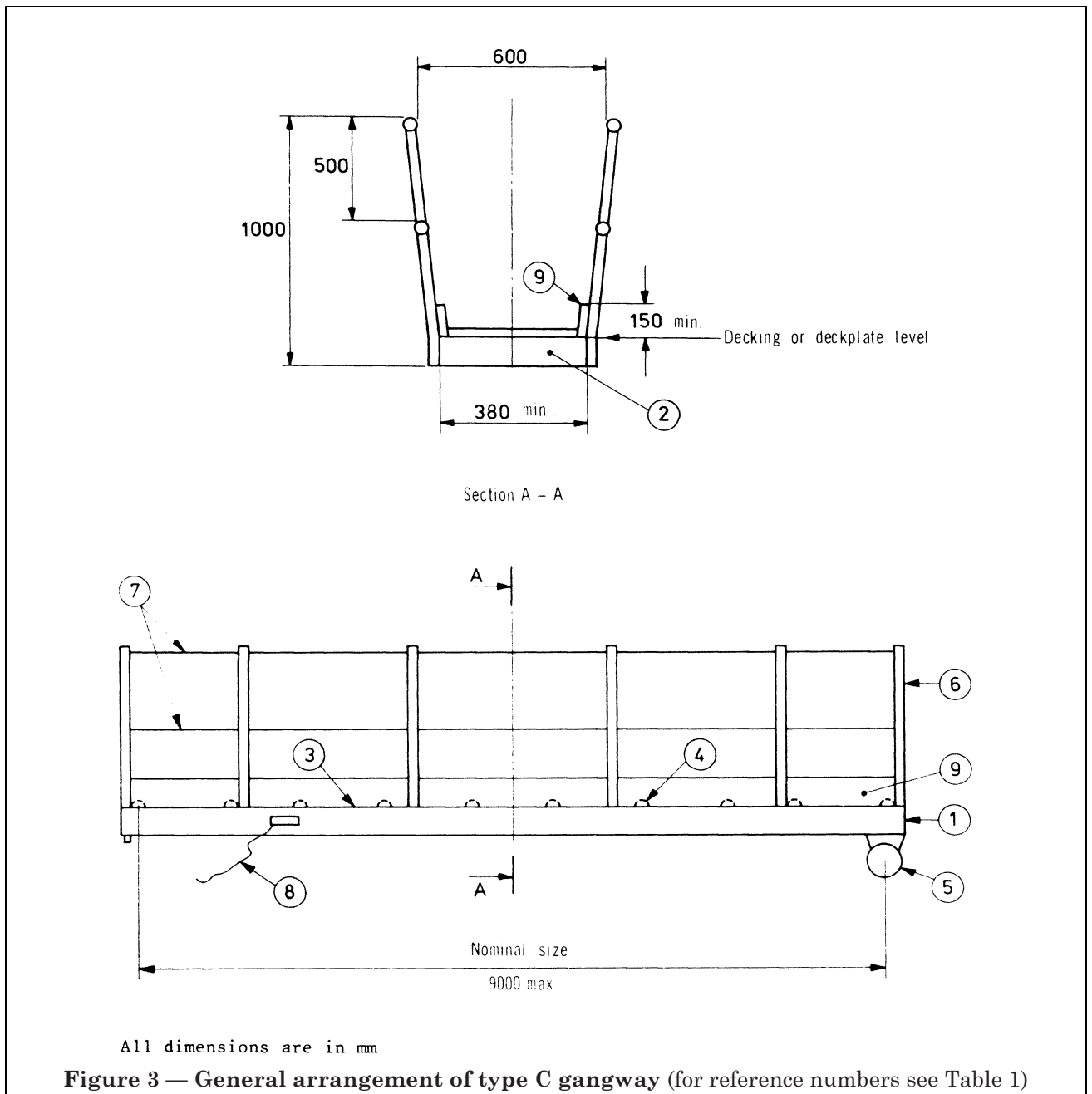
These are small lightweight gangways which can be manhandled into position and may be used for the quick disembarkation of a small number of people when a ship first secures alongside. In this standard these are designated as type C. Nominal sizes and stowage dimensions are given in Table 4 and Table 5 and the general arrangement is shown in Figure 3.

Table 4 — Nominal sizes and stowage dimensions of type C (fixed handguides)

Nominal size	Maximum stowage dimensional (mm) of uncrated gangways with fixed handguides		
	Maximum overall length	Maximum overall width	Maximum depth (fixed handguides)
3 000	3 650	650	1 250
4 500	5 150	650	1 250
6 000	6 650	650	1 250
7 500	8 150	650	1 300
9 000	9 650	650	1 300

Table 5 — Nominal sizes and stowage dimensions of type C (hinged or portable handguides)

Nominal size	Maximum stowage dimensions (mm) of uncrated gangways with hinged or portable handguides		
	Maximum overall length	Maximum overall width	Maximum depth (stanchions removed or folded flat)
3 000	3 650	650	470
4 500	5 150	650	470
6 000	6 650	650	480
7 500	8 150	650	500
9 000	9 650	650	500



Appendix B Method of test for initial sag and deflection of gangways

B.1 Initial sag shall be determined by placing the gangway horizontally on supports positioned according to the nominal size. The gangway is fully assembled with all fittings comprising the dead load. Stretch a thin string or wire tightly between the two support points and measure the maximum vertical distance y appearing between the horizontal line and the base of the gangway. The procedure is adopted for both side stringers and the average of the two readings is taken as

$$\text{initial sag} = \frac{y_1 + y_2}{2}$$

B.2 The deflection test shall be carried out immediately after the results of initial sag are determined. Apply, without shock, a uniform load equivalent to 4 000 N/m² to the longitudinal centre line of the decking. The load should be arranged from a selection of convenient sized sandbags or other material which will not damage the gangway, and located at intervals of not more than 1 000 mm. Where the design incorporates individual decking plates a load equivalent to 4 000 N/m² shall be applied to each plate. The test load is applied for 15 minutes before the deflection movement of the gangway is measured.

The maximum movement of each side stringer x is measured between the string or wire stretched tightly between the support points and the base of the gangway as follows:

$$\frac{x_1 + x_2}{2}$$

Calculate the deflection as follows:

$$\frac{x_1 + x_2}{2} - \frac{y_1 + y_2}{2}$$

The maximum deflection shall not exceed the limit of nominal size .
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