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Technical product documentation (TPD) — General principles of presentation —

Part 15: Presentation of shipbuilding drawings

Documentation technique de produits (TPD) — Principes généraux de représentation —

Partie 15: Représentation des dessins de construction navale

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 10, *Technical product documentation*, Subcommittee SC 6, *Mechanical engineering documentation*.

ISO 128 consists of the following parts, under the general title *Technical drawings — General principles of presentation*:

— *Part 1: Introduction and index*

— *Part 15: Presentation of shipbuilding drawings*

— *Part 20: Basic conventions for lines*

— *Part 21: Preparation of lines by CAD systems*

— *Part 22: Basic conventions and applications for leader lines and reference lines*

— *Part 23: Lines on construction drawings*

— *Part 24: Lines on mechanical engineering drawings*

— *Part 25: Lines on shipbuilding drawings*

— *Part 30: Basic conventions for views*

— *Part 34: Views on mechanical engineering drawings*

— *Part 40: Basic conventions for cuts and sections*

— *Part 44: Sections on mechanical engineering drawings*

— *Part 50: Basic conventions for representing areas on cuts and sections*

— *Part 71: Simplified representation for mechanical engineering drawings* [Technical Specification]

Technical product documentation (TPD) — General principles of presentation —

Part 15: Presentation of shipbuilding drawings

1 Scope

This part of ISO 128 specifies the presentation of shipbuilding drawings for general use on metal hulls.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 128-25, *Technical drawings — General principles of presentation — Part 25: Lines on shipbuilding drawings*

ISO 3098-2, *Technical product documentation — Lettering — Part 2: Latin alphabet, numerals and marks*

ISO 5455, *Technical drawings — Scales*

ISO 5457, *Technical product documentation — Sizes and layout of drawing sheets*

ISO 6428, *Technical drawings — Requirements for microcopying*

3 General principles

The rules of sizes and layout of drawing sheets given in ISO 5457 apply.

The rules of scales given in ISO 5455 apply.

The basic types of lines, their designations and dimensions as well as general for draughting of line given in ISO 128-25 apply.

The requirements for microcopying given in ISO 6428 apply.

NOTE All figures in this International Standard are in the first angle projection method. The third angle projection method could equally well have been used without prejudice to the principles established.

4 Presentation of drawings

4.1 Basic requirements

4.1.1 The drawings shall be made in orthographic projection.

4.1.2 On the drawings, the stern is to the left and the bow is to the right.

4.1.3 The name of view (identification letter) is indicated at the top of the drawing.

4.1.4 The layout of the drawing shall be presented clearly and concisely. For drawings of the entire vessel, generally, the side view is in the upper position of the drawing and plan view is in middle or lower position. For drawings of the block structure, normally, the side view (longitudinal section in centerplane, outer shell-plate developed view) is in the upper left or middle left and the plan view (platform, deck and bilge drawing) is in the lower left or middle left. The section and detailed drawings are located on the right side or another blank space on the drawings.

4.2 View

4.2.1 Basic view

The basic view is the drawing of hull and structure projected at basic projection planes. The basic views generally comprise of side view, plan view, bow view and stern view.

4.2.2 Directional view

The directional view is the drawing of hull and structure projected at certain direction. The projection direction and view name are expressed with identification letter symbol and capital Latin letter for directional view. See Figures 1 a) and c).

When the directional view is used to show that the structure is not in the same plane, the structure shall be developed to be in the same plane as shown in Figures 1 b) and c).

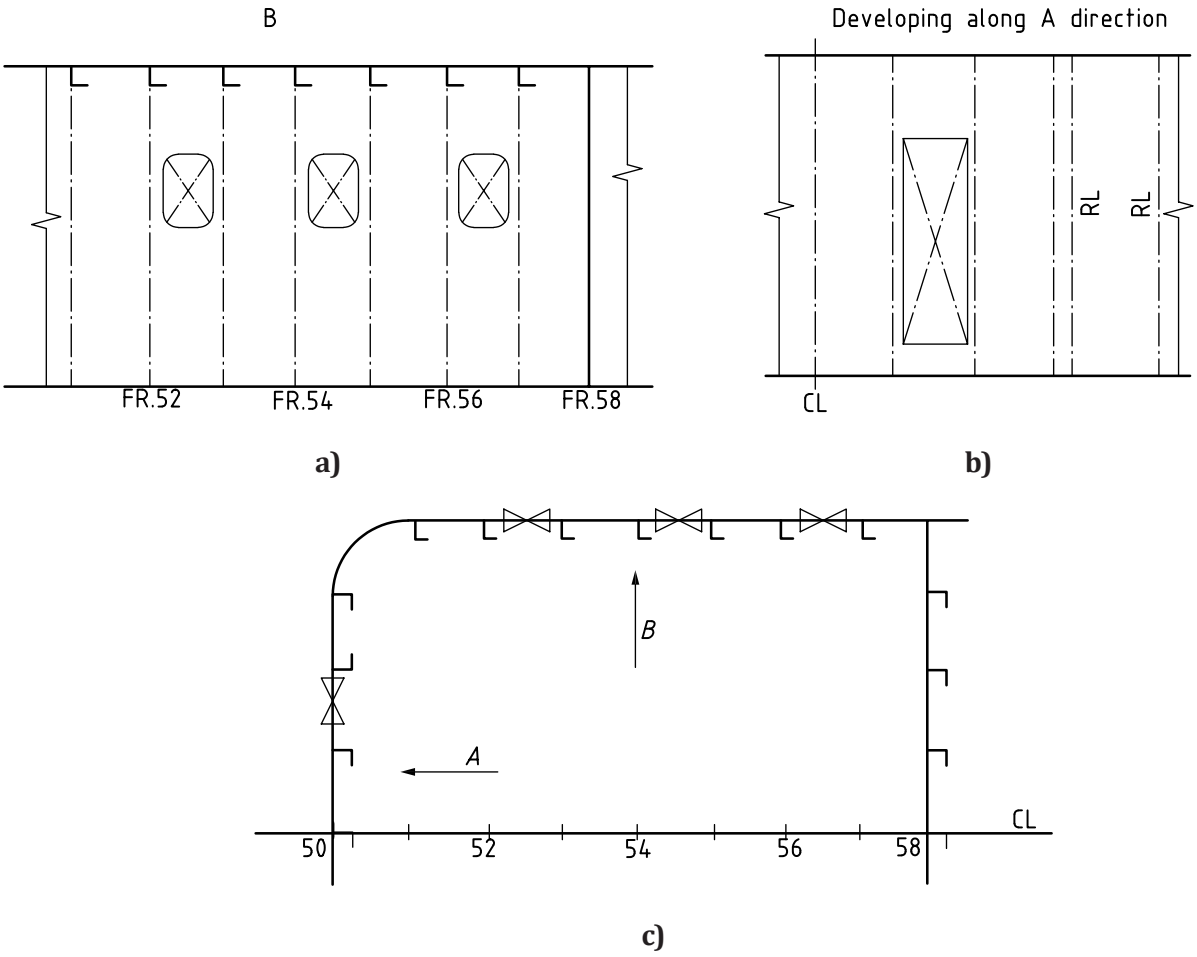


Figure 1

4.3 Sectional view

When the structure has symmetrical planes, it can be divided at the centerline of symmetry with one part shown by a sectional view and the other part by another view, such as a double-bottom plan view.

A partial sectional view can be used to show the part structure.

A breaking line or a wavy continuous line can be used as a dividing line between the sectional view and other views on the plan drawings. See Figure 2.

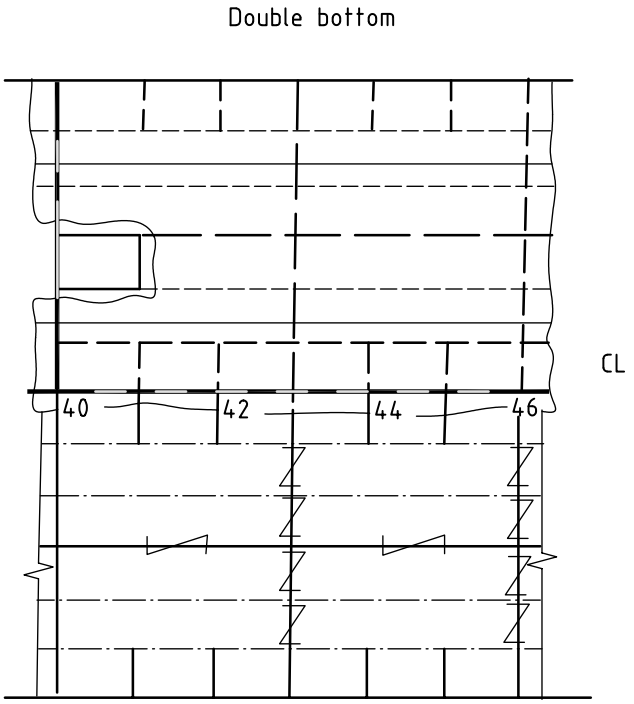


Figure 2

4.4 Section

4.4.1 Frame section

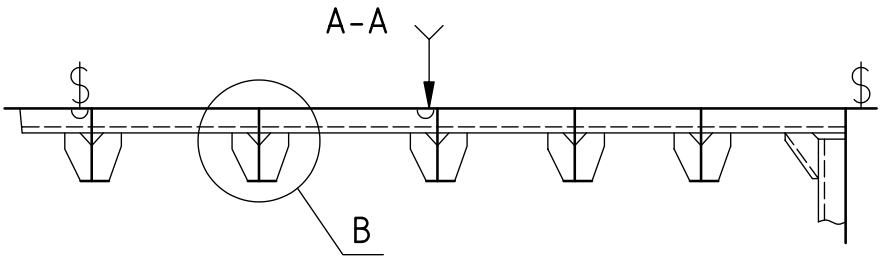
The frame section is the section used to show the structural form at the frame which is indicated by frame number and view symbol to show section position, section name and projection direction.

EXAMPLE FR55 → (indicating the section at frame no. 55, bow direction), FR60 ← (FR61- FR65 similar) (indicating the section at frame no. 60 stern direction. The frame between no. 61–65 in the stern direction is similar). See Figure 3 c).

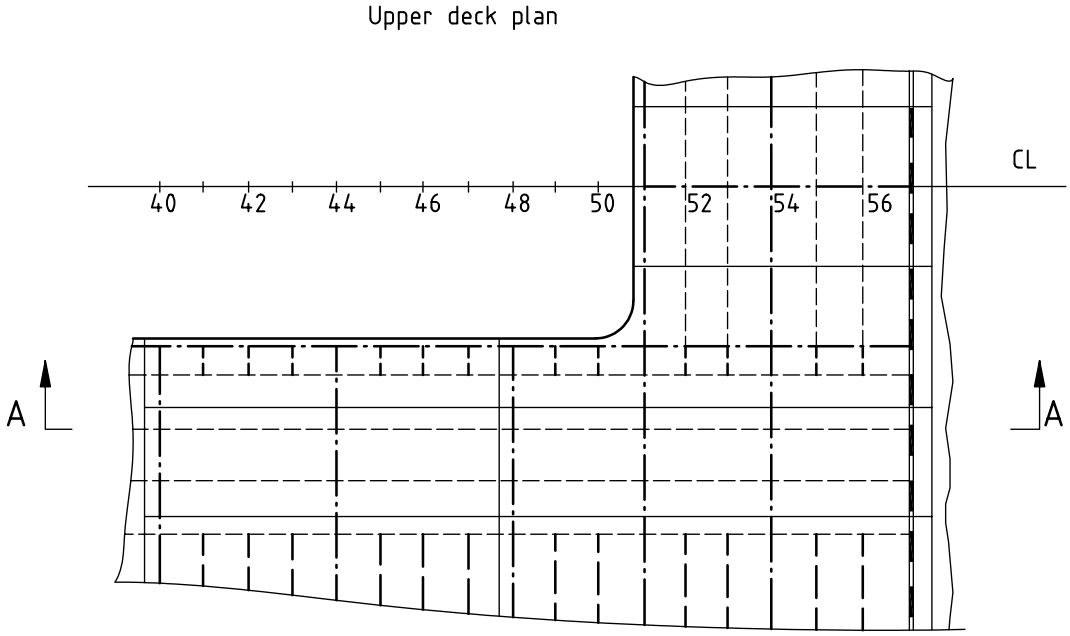
4.4.2 General section

The general section refers to the section at every other position except the frame, which is indicated by section symbol and capital Latin letter to show section position, section name and projection direction. See Figures 3 a) and b).

The section may also be drawn directly on the extension line (long-dashed dotted narrow line) of the section trace without any other indications. See Figure 4. When necessary, it may be drawn with magnification scale.

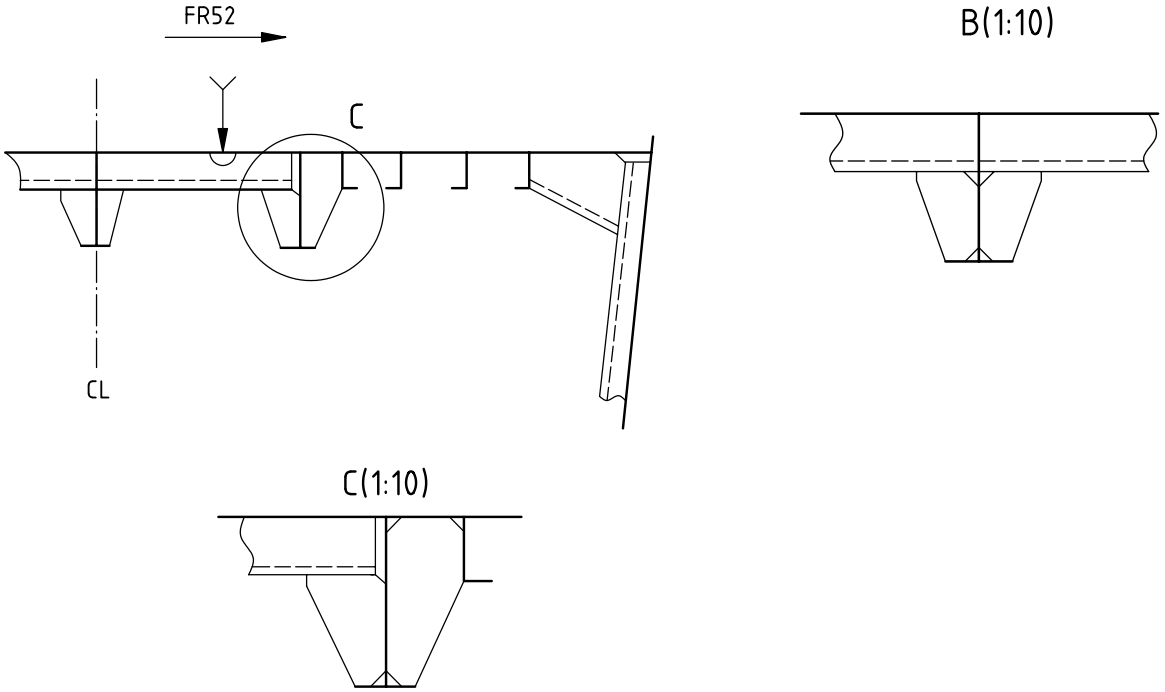


a)



b)

Figure 3 (continued on the next page)



c)

Figure 3

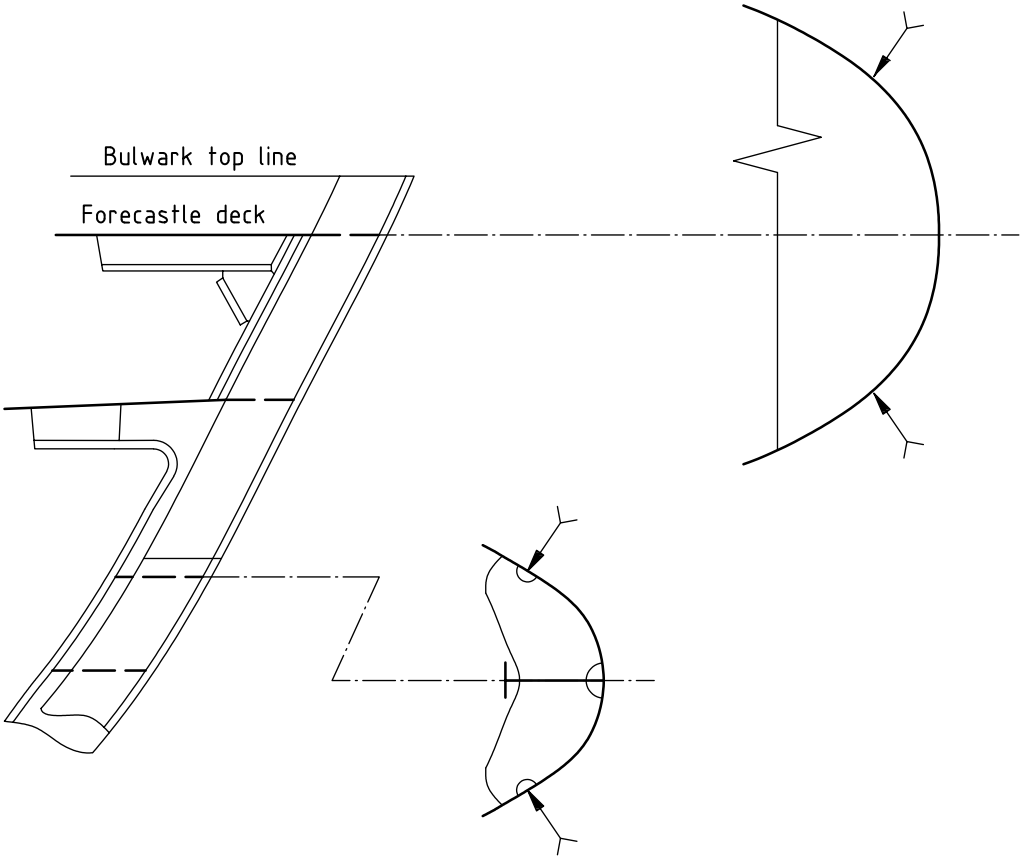


Figure 4

4.4.3 Sub-section

Sub-section refers to a drawing by projection after sub-sectioning, indicating by section symbol to show section position and projection direction. The title of sub-section is indicated by the original drawing title plus the serial number. See Figure 5.

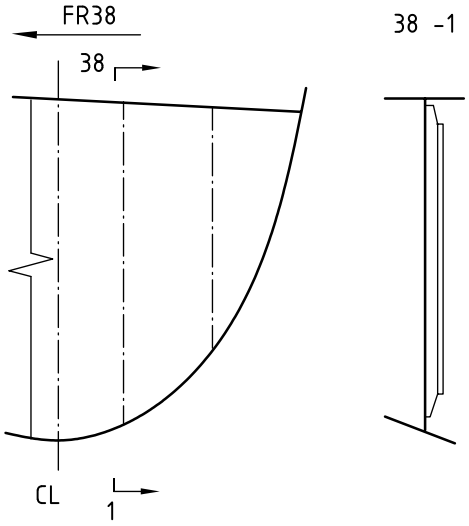


Figure 5

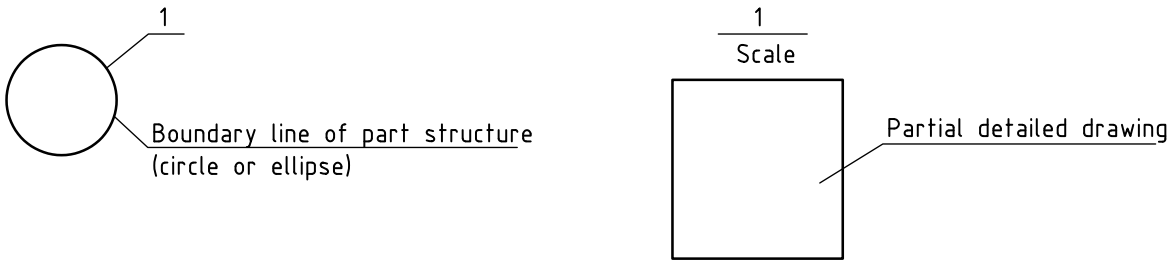
4.5 Partial detailed drawing

A structure not shown clearly in the view may be manifested by separate detailed drawings with greater scale. Encircle (with a circle or an ellipse) the enlarged portion with a continous thin line when making the partial detailed drawing.

— If there is more than one enlarged portion for a component, these portions should be coded with appropriate-sized Arabic numbers in an orderly manner; the corresponding Arabic numbers and scales should be labelled on the partial detailed drawing as shown in Figure 6.

— If there is only one enlarged portion, this portion should be drawn near the original drawing with the scale labelled on top of the partial detailed drawing, and no coding is needed.

See Figure 3 a).



a) **b)**

Figure 6

4.6 Special drawing methods

4.6.1 Moulded line projection

The projection of the intersecting line (moulded line) between the moulded hull surface and the section and outline of moulded surface, side deck line, bulwark top line, etc. on three basic projection planes can be represented in moulded line projection such as hull moulded line drawing and frame moulded line drawing, etc.

4.6.2 Overlapping drawing method

Overlapping drawing method shall be used when drawing the members not in the same section on the same section. The outline of the section may only show one section, such as the typical transverse sectional view.

4.6.3 Unidirectional developing drawing method

The outer shell-plate developed drawing is made by the unidirectional developing drawing method. The frame line is extended transversely by taking the keel line as the reference and by not extending the hull longitudinally.

4.6.4 Double representation

Double is represented by a double outline plus a fine oblique line on the plan view. See Figure 7.

4.6.5 Unsymmetrical representation

When the plan view is only of half a part and the location of the openings and the double on the drawing are not symmetrical, this shall be indicated by “only portside” or “only starboard”. See Figure 7.

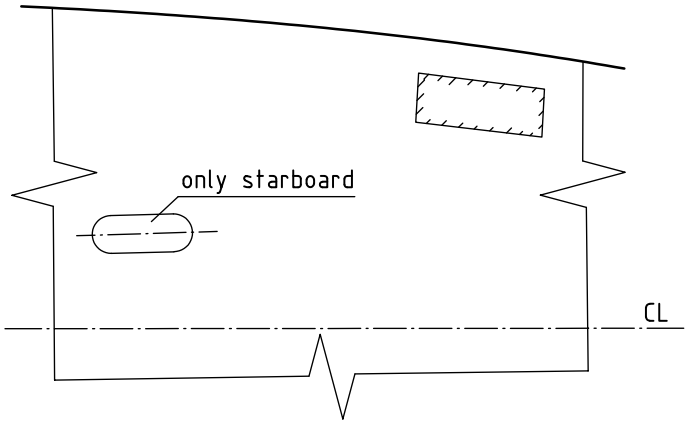


Figure 7

4.7 Simplified representation

4.7.1 Simplified expression of a swaged casing wall or a grooved bulkhead

The simplified expression of a swaged casing wall or a grooved bulkhead is shown in Figure 8.

The swage and groove symbols “U” “V” and “ ⏢ ” indicate that the swage is on front side of the flat plate, as shown in Figures 8 a) and b). The upside-down symbols indicate that the swage is on the back side of the flat plate, as shown in Figures 8 c) and d).

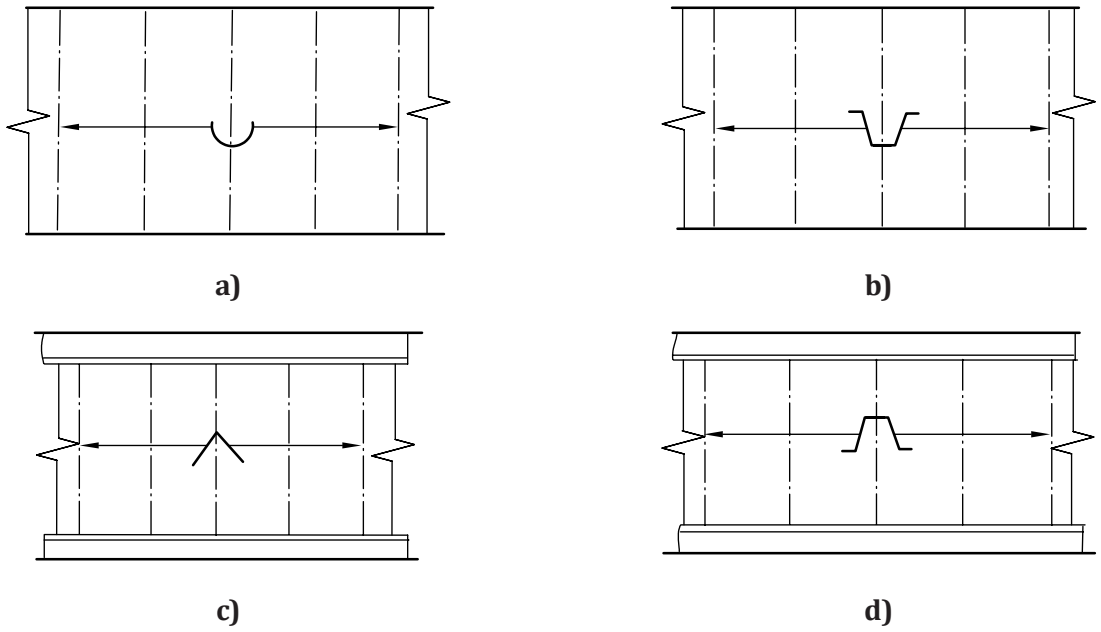


Figure 8

4.7.2 Manhole and lightening hole

If the solid floor and side web have the same holes, only one end hole is drawn and the other holes are expressed by a positioning axis. See Figures 9 and 10.

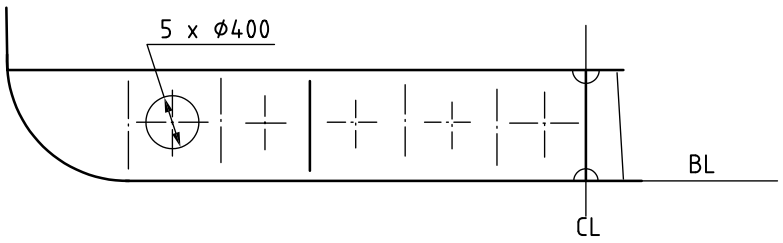


Figure 9

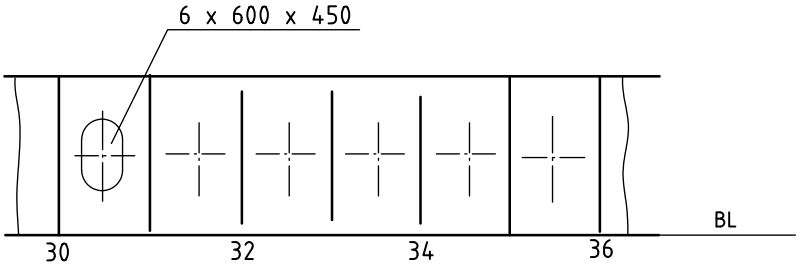


Figure 10

5 Coding and arrangement

5.1 The coding of station, waterline and buttock lines

5.1.1 The coding for stations begins from station 0 at after perpendicular (AP) and moves forward to the bow ending with station 10 (or 20) at forward perpendicular (FP). If additional stations are added at the stern and bow, these can be indicated by fractions as shown in Figure 11. The stations after AP shall be differentiated by a minus sign.

5.1.2 The waterline is named by the height above the baseline, such as 1000WL, 2000WL, etc. See Figure 11.

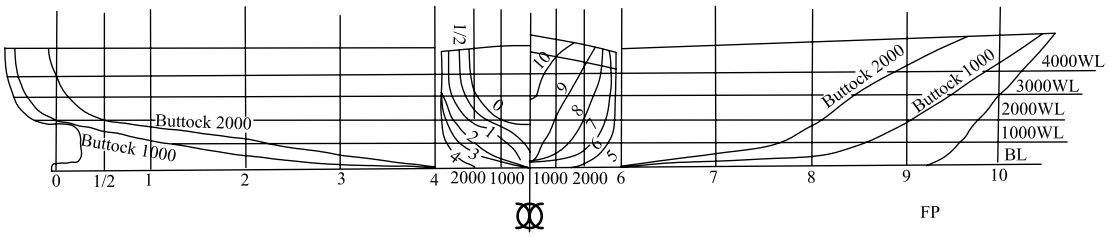


Figure 11

5.1.3 The buttock line is named by the width from the centre line, for example “buttock 1000” and “buttock 2000”. See Figure 11.

5.2 Coding of frame

5.2.1 The coding for the frame begins from 0 before after perpendicular (AP) (including AP) and moves forward from stern to bow. The frame after 0 shall be differentiated by a minus sign.

5.2.2 The frame number is indicated every five frames for drawing of the whole ship. If the frame spacing is different, the frame spacing shall be indicated in its frame area as shown on Figure 12. For hull block structure drawings, the frame shall be indicated by an even number. If there are fewer than four frames, all the frames shall be indicated, as shown in Figure 13.

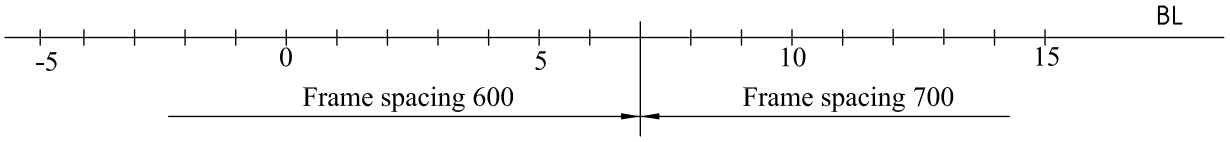


Figure 12

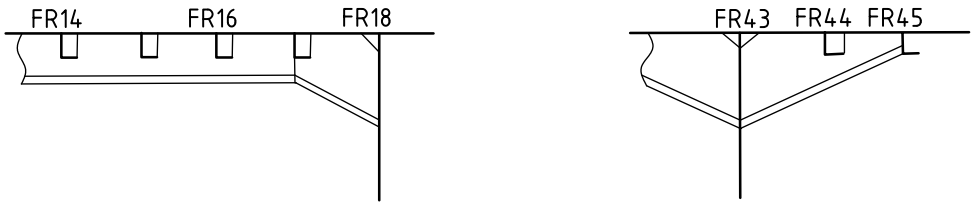


Figure 13

5.2.3 The number of the frame not on the hull’s centerline (CL) and base line (BL) shall be indicated by “FR”.

5.3 Coding of the outer shell plate

The code of the outer shell plate is comprised of capital Latin letters and an Arabic serial number (hereinafter shortened as “serial number”).

The strake takes the flat keel as K and the broadside top strake as S; it is arranged from flat keel to boardside top strake sequentially as A, B, C, … The footnote for each plate is arranged from stern to bow sequentially as shown in Figure 14.

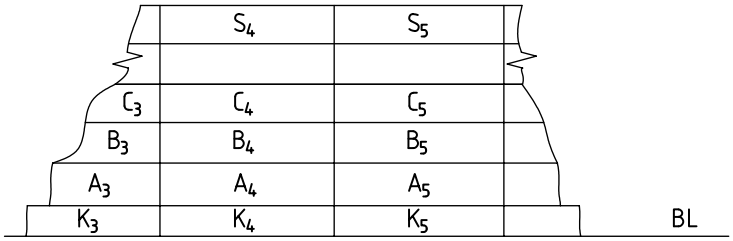


Figure 14

5.4 Coding of stringer

The stringer is coded in accordance with the serial number.

The broadside stringer and the bulkhead horizontal girder are coded from top to bottom. When coding for the deck and bottom longitudinal girder is necessary, the centre line shall be taken as the reference and the coding shall be from the middle toward the broadside.

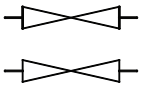
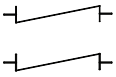
5.5 Coding of liquid tank and cargo hold

The liquid tank and cargo hold are coded from bow to stern sequentially. If these are separated by a longitudinal bulkhead, the code shall be followed by the Latin letter P for portside, C for centre or S for starboard. For example, N.01 P indicates the first cargo hold portside.

6 Graphic symbols

The graphic symbols are indicated in Table 1.

Table 1 — Graphic symbols

No.	Name		Symbol	Example
1	Amidship symbol			See Figure 11.
2	Symbol for abutted seam and side seam	Generic seam		See Figure 3.
		Segmentation seam		
3	Small opening section symbol			See Figure 1.
				See Figure 2.
4	Center line		CL	See Figure 1.
5	Rounded line		RL	See Figure 1.
6	Frame no.		FR	See Figure 5.
7	Molded base line		BL	See Figure 10.
8	Waterline		WL	See Figure 11.

Bibliography

[1] ISO 128-40, *Technical drawings — General principles of presentation — Part 40: Basic conventions for cuts and sections*

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