M.18.3 Steel Bulkheads

M.18.3.1 The scantlings of steel bulkheads shall be determined by using Sub-section L of the Construction Section.

M.18.3.2 Steel bulkheads may be fitted to the faces of hull grounds and deck beams in the same vertical plane by means of a boundary angle or directly fastened flat upon the vertical faces. A mastic sealant shall be used between the bulkhead, grounds and deck beams.

M.18.3.3 Where a steel bulkhead is attached to the face of the grounds and deck beams or by a boundary angle, the siding of the grounds shall be 2 times the flange length of the boundary angle, and the moulding equal to that for a timber bulkhead of similar height.

M.19 Pillars or Stanchions

M.19.1 Pillar Load

The load on a pillar is to be obtained from the following equation:

$$w = 0.715 \text{ bhs tonnes}$$

where:

w = load in tonnes

b = mean breadth in metres of area supported

s = spacing of pillars in metres

h = height in metres above the deck supported, as defined below:

(a) h for a pillar below an exposed deck on which cargo is carried is the distance from the deck supported, to a point 3.65 metres above the exposed deck. Where it is intended to carry deck cargoes in excess of 2640 kg /m² this head is to be increased in proportion to the added loads which will be imposed on the structure.

(b) Where tweendeck cargo is carried and its mass is greater or less than 2640 kg/m², h is also to be suitably adjusted.

(c) h for a pillar below the freeboard deck is to be measured to a point not less than 0.02L + 0.75 metres above the freeboard deck.

(d) h for a pillar below the superstructure deck is to be measured to a point not less than 0.02L + 0.50 metres above the superstructure deck.

M.19.2 Permissible Load

(a) The permissible load pillar can carry is to be equal to or greater than the pillar load w as determined above. The permissible load may be obtained from the equation:

$$wa = \frac{A}{1000}\left(1 - 17\left(\frac{l}{a}\right)\right) \text{tonnes}$$

where:

wa = Permissible load on the pillar in tonnes

A = Area of the pillar in square millimetres

l = The unsupported length of the pillar in metres

a = The diameter of a circular pillar or the shorter side of a rectangular pillar in millimetres.

Table M.14 gives pillar loadings for a representative selection of round and rectangular pillars.

M.19.3 The scantlings of pillars and stanchions of a material other than timber shall be determined from the appropriate Sub-sections of the Construction Section.

M.19.4 Pillars or stanchions may be placed directly under beams, deck opening corners or deck longitudinals. The spacing of pillars fitted under longitudinals between bulkheads shall not exceed 5 times the beam spacing = 500 mm in the fore and aft direction nor shall they be placed more than 25 per cent of the beam from the vessel's centreline.

M.19.5 Supports under pillars or stanchions are to be of sufficient strength to distribute the loads effectively.

M.20 Engine Seatings

M.20.1 The engine seatings are to be of dimensions commensurate with the power of the machinery fitted thereto. They should

(i) be of a length not less than twice the distance between the extreme holding down bolts;

(ii) distribute the load over as many transverses as possible;

(iii) terminate on a substantial transverse member; and

(iv) be checked over and securely fastened through all transverse floors and the hull planking.

M.20.2 Where the maximum height of a timber engine seating above the top of those floors required by M.13 and M.14 exceeds three times the siding of the seating, then the seating shall be stiffened and supported with side brackets on every second floor. Support shall also be provided between the seatings in way of the side brackets.

M.21 Deckhouses

M.21.1 Timber framed deckhouses are required to have substantial scantlings and be adequately fastened to ensure weathertightness.

M.21.2 They should be constructed on trunks or coamings efficiently fastened to carlings and/or deck beams.

M.21.3 Coamings to framed deckhouses shall be not less than 225 mm in height and sided not less than the moulding of the deckhouse framing.

M.21.4 The planking of timber deckhouses shall be not less than that shown in Table M.15. All planking shall be bedded into a mastic sealant if rabbetted into the deckhouse framing.

M.21.5 Deckhouse top beams and covering shall be as shown in Table M.15. A top plate of siding and moulding equal to that for the side stiffeners, shall be fitted for the length of the house.

M.21.6 The scantlings for deckhouses of materials other than timber are to be determined from the appropriate Sub-sections of the Construction Section.

M.21.7 Deckhouses of materials other than timber shall be through fastened to coamings, decking or carlings after bedding in a mastic sealant.

PART 3—SCANTLINGS FOR HARD CHINE VESSELS

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PART 3—SCANTLINGS FOR HARD CHINE VESSELS

Note:

Scantlings for double diagonal planked vessels are to be considered under this Part. Scantlings for hard chine, plywood vessels constructed on a system of longitudinal frames, supported by web frames may be derived under the provisions of Part 4.

M.22 Keel and Hog

M.22.1 The keel shall be sided and moulded as indicated in Table M.17, except in the case of single planked hard chine displacement vessels when they shall be as indicated in Table M.1. The siding and moulding shown therein may be varied in accordance with the notes to these Tables.

M.22.2 The minimum hog siding and moulding shall be as shown in Table M.17 except in the case of single planked hard chine displacement vessels when they shall be as indicated in Table M.1, but may be varied in accordance with the notes to these Tables.

M.22.3 The keel and hog may be either laminated or of solid timber construction. Where of solid timber construction the keel and hog in vessels less than 10 metres in length shall be in one length, and for vessels 10 metres in length and over where the keel or hog is not in one length it shall be efficiently scarphed.

M.22.4 Where a keel or hog is scarphed, such scarphs shall be in accordance with M.5.4 and M.5.5.

Where the keel and hog are made from one piece of timber or are of glued laminated construction, a reduction in cross sectional area of up to 15 per cent of the total combined areas for the keel and hog, obtained from Table M.17, may be made.

Stopwaters shall be fitted to all centreline construction joints where they intercept the rabbet line.

M.23 Stem

M.23.1 Stem scantlings at the heel shall in no case be less in siding and moulding than the scantlings for the keel determined from M.22 and Table M.17.

M.23.2 The scarph of the stem to keel shall not be less than 2.5 times the keel moulding in length.

M.24 Transom

M.24.1 Transom thickness shall be obtained from Table M.18 and associated notes, except in the case of single planked hard chine displacement vessels when the transom thickness shall be obtained from Table M.5.

M.24.2 Transoms shall have stiffeners, spaced at not more than 450 mm centres, together with margins. The stiffeners and margins shall have scantlings derived from Table M.18 except in the case of single planked hard chine displacement vessels when the scantlings shall be obtained from Table M.5.

M.24.3 A substantial knee shall be fitted and through bolted through the transom and the hog.

M.25 Web Frames

M.25.1 The scantlings for web frames are to be derived from M.12 and Table M.7.

M.26 Intermediate Frames in Longitudinally Planked Hard Chine Hulls

M.26.1 Intermediate frames, of dimensions and spacings determined for the frames in round bilge hulls having the same measured length, are required to be provided and fitted between the web frames.

These frames should be housed into the chine a distance of not more than 10 mm for their full cross sectional area and dead nailed to the sheer clamp.

M.27 Floors

M.27.1 Floors shall be fitted at each transverse web frame and between web frames at not more than 450 mm centres.

M.27.2 The siding and moulding of floors shall be determined from Table M.19.

M.27.3 Where floors are fitted in the throat of a web frame then the siding may be reduced to that of the web frame, provided the moulding is increased to maintain the section area at the vessel's centreline.

M.27.4 Intermediate floors between web frames shall extend and be fastened to a stringer.

M.28 Stringers

M.28.1 The scantlings of bottom stringers shall be determined from Table M.20 and associated notes.

M.28.2 A reduction in scantlings to 60 per cent of the scantlings determined from Table M.20 may be made for side stringers.

M.28.3 Stringers should run for the full length of the vessel wherever possible.

M.28.4 Where practicable, stringers should be in one length. If not in one length stringers shall be scarphed.

M.28.5 Where stringers are scarphed, scarphs shall be not less in length than 6 times the dimension of the edge or face scaphed, and suitably fastened.

M.28.6 Feather edge scarphs shall be suitably fastened and glued.

M.29 Chines

M.29.1 The minimum scantlings for chines shall be determined from Table M.21.

M.29.2 The ratio of siding to moulding of chines is generally not to be greater than 1 to 2. In any case the siding shall be sufficient to provide a faying surface equal to 2.5 times the thickness of the bottom planking.

M.29.3 Where practicable, chines should be in one length. If not in one length chines shall be scarphed.

M.29.4 Where chines are scarphed, scarphs shall be not less in length than 6 times the siding and suitably fastened.

M.29.5 The ends of diagonal planking and plywood shall be protected at the chine edge.

M.30 Chines for Single Planked Vessels

(a) The dimensions of chines are to be determined from Table M.9.

(b) Where practicable, chines should be in one length, but may be scarphed, in which case the scarphs shall be not less in length than 6 times the moulding and be edge bolted.

M.31 Beam Shelf/Sheer Clamp

M.31.1 A suitable beam shelf and/or sheer clamp shall be fitted and the minimum section area shown in Table M.22 is to be maintained.

M.31.2 The siding of the sheer clamp shall be sufficient to maintain faying surfaces equal to twice the deck planking thickness.

M.32 Fitting of Longitudinal Members

M.32.1 Beyond 0.6L amidships the scantlings of stringers, chines, sheer clamps and beam shelves may be reduced by a uniform taper of both moulding and siding by up to 20 per cent of the cross sectional area shown in the Tables.

M.32.2 Scarphs in stringers, sheer clamps, beam shelf etc., may not be closer than the web frame spacing, measured between the closest extremities of the scarphs considered. Scarphs are not permitted in way of bulkheads, web frames, or in line with keel scarphs. The scarph in a sheer clamp shall not be closer to the butt in a sheer strake than one web frame spacing.

M.32.3 Breasthooks of grown timber or chocks of straight grain or brackets are to be fitted at the forward end of the hull between the stem and:

(i) Sheer clamp

(ii) Chines in vessels of 12.5 metres in length and over.

M.32.4 Grown knees, solid chocks or brackets are required to be fitted between the transom and:

(i) Sheer clamp

(ii) Chines in vessels of 12.5 metres in length and over

(iii) Every second stringer in vessels of 12.5 metres in length and over.

M.33 Hull Planking

M.33.1 The hull planking thickness shall be determined in accordance with Table M.23 and associated notes.

M.33.2 Single layer plywood planking shall be provided with butt straps and fastenings in accordance with Table M.24 and associated notes.

M.33.3 Where multiple layers of plywood are used then minimum overlaps, having the same width as the butt straps determined from Table M.24, shall be provided.

M.33.4 Where in double planked fully glued diagonal construction the planking layers are laid parallel to each other, then the overlap between alternate layers shall be not less than 4 times the plank thickness and not more than half the plank width.

M.34 Deck Planking

M.34.1 Deck planking thickness shall be determined in accordance with Table M.13 and associated notes.

M.34.2 For single planked decks the planking is generally to have sidings not more than twice the table thickness. Butts shall not be closer than 1500 mm to each other unless there is a passing plank between when a distance of 1200 mm may be allowed.

No butts shall be in the same transverse plane unless there are three passing planks between.

M.34.3 The scantlings of deck longitudinals associated with plywood decks shall be determined in accordance with Table M.27 and associated notes.

M.35 Deck Beams

M.35.1 Subject to M.34.3 the scantlings of deck beams shall be determined in accordance with M.17 and Table M.12.