

PART 1

PLANS, PARTICULARS AND MATERIALS

1.1 Plans and Particulars

1.1.1 General

To determine whether the proposals relating to the construction of the ship comply with the requirements of the Regulations the surveyor should obtain from the shipbuilder, owner, or his consultant, all plans and particulars necessary for the consideration of the case. See also Survey and Certification Instructions - Part covering "Fees Estimates".

All plans, particulars and calculations should be in the English language, or should include an adequate English translation. Measurements should be in metric units.

1.1.2 Plans and particulars to be submitted

The plans and particulars to be submitted should include the methods used to justify the arrangements, materials, constructional methods and scantlings proposed.

1.1.2.1 *Hull structural plans:-*

(i) All plans should identify the nature and physical properties of the materials being used and their means of connection.

(ii) Where the ship is to be classed with a recognised Classification Society, namely Lloyds Register of Shipping or the British Committees of Bureau Veritas, Det Norske Veritas, Germanischer Lloyd or Registro Italiano Navale or the British Technical Committee of the American Bureau of Shipping, it will be sufficient for the surveyor to obtain from the shipbuilder or consultant stamped approved copies of the drawings submitted to the Classification Society together with that Society's approval. The surveyor should ensure that the scantlings are approved for the required subdivision draught and the strength is sufficient for the service intended.

(iii) Watertight bulkheads are to be of sufficient strength and constructed so as to be capable of supporting, with an adequate margin of resistance, the pressure due to the maximum of head of water which might have to be sustained in the event of damage to the ship, not being less than the pressure due to a head of water up to the margin line. Such maximum head shall include any additional head, estimated under

Regulation 44 or 45 of Part V of the Regulations, which may result from flooding or heeling.

1.1.2.2 Subdivision arrangements and calculations:-

(i) Fully dimensioned outline elevation, plan and section views of the ship showing the margin line (corrected as appropriate, see paragraph 2.1.2 of these Instructions); all watertight transverse and longitudinal bulkheads, decks, inner skins, shaft and other tunnels, trunks and ventilators; the appropriation of spaces below the bulkhead deck; the position of equivalent plane bulkheads, the lengths of the main transverse compartments, and the weathertight arrangements above the bulkhead deck at the forward end. Tunnels, recesses and steps are to be shown in plan and elevation, and typical sections of the double bottom should be given.

(ii) Outline elevation, plan and section views of the ship showing the dimensions, number, location and type of all watertight doors and any other openings in watertight divisions which are closed only by portable bolted plates.

(iii) Either on a separate drawing or superimposed on that drawing referred to in sub-paragraph (i), flooding curves are to be submitted. As an alternative to flooding curves, a flooding calculation may be accepted as outlined in paragraph 2.5.1 of these Instructions. Where a ship is shown to be in full compliance with Regulations 2 to 8, 11 and 13 of IMO Resolution A.265(VIII), i.e. subdivision requirements based on the concept of the probability of survival, the development of flooding curves is not required.

(iv) To enable an independent check to be undertaken, full details of the following are to be submitted:-

- (a) calculation of the criterion numeral;
- (b) calculation of the factor of subdivision; and
- (c) calculations to determine the assumed permeabilities.

Where the requirements of paragraphs 3(1)(b) and 3(2)(a)(ii) of Section 2, and paragraph 8(1)(b) of Section 3 of Schedule 2 to Merchant Shipping Notice MSN 1698 (M) apply, particulars should be submitted at the earliest opportunity to enable the surveyor to determine whether a detailed calculation of permeability is required; and

- (d) Calculations to determine the position of equivalent plane bulkheads and allowances for local subdivision.

1.1.2.3 *Subdivision structural details:-*

Plans showing the scantlings and details of construction of all tanks forming part of the structure of the ship, e.g. oil fuel storage and settling tanks, water ballast tanks and fresh water tanks. Details should also be supplied of the size, type and position of all air and overflow pipes serving these tanks, indicating the pressure head upon which the scantlings are based.

1.1.2.4 *Other structural arrangements below and above the bulkhead deck:-*

(i) Plans showing the positions, sizes, types and details of all side scuttles and windows. In the case of side scuttles below the margin line the height of the sill of the side scuttle above the summer load line and/or the deepest subdivision load waterline should be stated.

(ii) Plans showing the arrangement and details of all gangway and cargo loading doors fitted in the shell or boundaries of enclosed super-structures, bow visors where fitted, weather-tight ramps used instead of doors for closing openings for cargo or vehicle loading, cargo loading doors in the collision bulkheads, and small doors used for pilot access, fuelling or other matters necessary for the operation of the ship.

(iii) Plans showing the arrangements and particulars of ship's side discharges including sewage systems, ash and rubbish chutes etc.

(iv) Plans showing the details of the oil fuel, fresh and feed water, bilge and ballast, salt water and sewage systems, and air, filling, sounding and scupper pipe arrangements.

(v) Plans showing the means of closing openings in the weather deck and means for clearing water from such a deck for compliance with Regulation 12 of Part II of the Regulations.

1.1.2.5 *Stability:-*

(i) Calculations are to be submitted as early as is practicable to show that for all anticipated conditions of loading, the intact and damage stability criteria required by Regulations 37, 44 and 45 respectively of Part V of the Regulations and Schedule 3 to Merchant Shipping Notice MSN 1698 (M), and specified in Part 5 of these Instructions, are met. To help interpret an asymmetric damage stability investigation, a clearly labelled plan should be produced indicating by means of cross hatching or numbers, those portions and elemental blocks which are assumed flooded or counter-flooded for each case of damage investigated, and their respective permeabilities.

(ii) If the ship is to carry permanent ballast, its type (solid or liquid), quantity and distribution should be indicated.

(iii) A report of the Inclining Experiment and the stability information is required.

(iv) A Damage Control Plan and Booklet in accordance with Regulation 47 of Part V of the Regulations, is required.

1.1.3 Importance of early submission of plans

1.1.3.1 The shipbuilder or his consultant should be informed by the surveyor of the importance of the early submission of the drawings and particulars listed in paragraph 1.1.2 of these Instructions. Work on the construction of the ship should await the acceptance of the submitted plans and particulars as inconvenience and delay may arise if alterations to the proposals are considered necessary.

1.1.3.2 The shipbuilder, or his consultant, should be requested to submit amendments to all drawings which clearly show which part, or parts, of the drawing have been modified. The marking of such drawings should enable the surveyor to consider amendments quickly. If amendments are not clearly illustrated, the surveyor should advise the shipbuilder, or his consultant, that delays and an associated increase in fees may be required to re-consider the whole of the drawing.

1.1.3.3 The receipt of all plans and documents is to be acknowledged immediately.

1.1.3.4 As the construction of the ship proceeds, the surveyor should ensure that the arrangements and details are in accordance with the accepted plans and particulars.

1.2 **Quality and Tests of Materials**

1.2.1 General

The quality, strength and testing of steel and aluminium alloy plates and sections used in the construction of the hull, bulkheads, decks, superstructures and deckhouses; and steel, bronze, gunmetal, brass, etc. castings used in the attachments thereto, are to be in accordance with recognised standards such as the requirements of a recognised Classification Society, or BSI/ISO. Otherwise particulars as paragraph 1.1.2 are to be provided for consideration.

1.3 Requirements for Side Scuttles and Windows

1.3.1 General

1.3.1.1 The approach to be taken when considering the acceptance of windows or side scuttles shall depend upon the basis upon which these items have been constructed.

1.3.1.2 They may be of a type which has previously been "Type Approved" by the Certifying Authority, they may be constructed to the rules of a recognised Classification Society or they may have been designed and constructed on a "one-off" basis, in which case approval shall be by examination. See below.

1.3.2 Type Approved Side Scuttles and Windows

1.3.2.1 Where Side Scuttles and Windows are constructed in accordance with a Type Approved design, then their frames should be marked in accordance with the applicable standard under which such type approval was given. Recognised standards are BSMA24 and BSMA25 and their ISO equivalents, namely ISO 1751 and ISO 3903.

1.3.2.2 In addition, glasses used in the construction of Side Scuttles and Windows should also comply with the relevant requirements of BSMA24 and BSMA25 or their ISO equivalents, namely ISO 1095 and ISO 614 or ISO 3254 and ISO 614, relating to size and strength of toughened glass panes. Where glass panes used in the construction of Side Scuttles and Windows meet the requirements of one of the above standards for strength, they should be marked in accordance with the provisions of BSMA24, BSMA25 or ISO 614 as appropriate.

1.3.2.3 Additional checks which should be undertaken during plan and as fitted approval, are comparison of the frames and fitting with the requirements of the applicable standard. Where there is any doubt, further comparison would need to be made with the approved drawings cited in the Approval Certificate (or attached Schedules) before any referral was made to Headquarters for advice regarding non-compliance of the frame with the approved design or of the approved design in relation to the applicable standard.

1.3.2.4 Note that type approved frames of BSMA type should be marked with the thickness of the glass which they are designed to accept. For "double glazed" units, this thickness shall include the full depth of both panes and the intermediate air gap.

1.3.3 Class Approved Side Scuttles and Windows

1.3.3.1 Where Side Scuttles and Windows are constructed in accordance with the requirements of a recognised Classification Society, then the surveyor should approach the builders to provide supporting documentation in the form of copies of the approved construction drawings stamped and endorsed by the Class Society.

1.3.3.2 It is of particular importance in such cases that the surveyor should satisfy himself that approval of both the frame and the glasses is given with respect to construction rules which are fully appropriate for the design the proposed position and the service of the vessel.

1.3.4 Side Scuttles and Windows of Non-Approved Type

1.3.4.1 Where Side Scuttles and Windows presented for survey are not of a type previously approved in accordance with the requirements of a recognised standard, then the surveyor should undertake approval of the such items on an individual basis for the vessel concerned. See paragraph 1.1.2 of these Instructions.

1.3.4.2 Such an approach should commence by assessing the frames against a recognised standard appropriate to the proposed application, noting that strength tests may be required on sample panes to confirm compliance where documentary evidence is not available, and that glass thicknesses are appropriate to the position and size of the each side scuttle or window under consideration. See paragraph 1.3.2.2 of these Instructions.

1.3.4.3 Where the design of proposed frames and glasses is shown to comply with the requirements of the applicable standard the frames should be marked during manufacture in accordance with the provisions of the standard, where such markings are specified, and formal notification of the approval should be given to the builders.

1.3.4.4 In cases where non-approved frames presented for survey do not conform to any recognised standard, or are not in full accordance with the provisions of the applicable standard, full details including supporting documentation regarding the chemical composition and mechanical strength of the materials used should be referred to Headquarters for consideration of acceptance as an "equivalent" to the requirements of a relevant standard.

1.3.5 Side Scuttles and Windows - Glazing Materials other than Glass

1.3.5.1 The material used for side scuttles, windows and for enclosing promenades and deck spaces should normally be heat treated toughened safety glass. However, the use of other materials may be considered provided that these fulfil relevant provisions for strength, stiffness, structural fire protection, visibility and location and suitability for use in escapes.

1.3.5.2 In general, where it is proposed to use materials other than toughened safety glass panes, their use should be in accordance with the requirements of an acceptable standard appropriate to the proposed Class and service of the vessel. Otherwise, full details of the proposed materials and their use should be submitted to Headquarters for consideration of acceptance as an "equivalent" to the requirements of a relevant standard.

1.3.6 Internal Glazing of Windows and other Translucent Divisions

1.3.6.1 Where it is proposed to fit internal glazed divisions in a vessel, then application of BSMA25, or its equivalent ISO 3903, may not be appropriate.

1.3.6.2 Whilst such internal divisions should be glazed using heat treated toughened safety glass, the use of other materials will be accepted provided that these comply with the requirements of an acceptable standard. Such standards may be those of a recognised Classification Society, appropriate for the Class and service of the vessel, or other national or international standards applicable to such divisions, provided that they are appropriate to the application under consideration.

1.3.6.3 In such cases the surveyor should satisfy himself that any such division is constructed in a manner which shall afford passengers and crew the maximum protection in the event of breakage.

1.3.6.4 An appropriate standard for such consideration would be BS6206:1981 which relates to the "impact" testing of glazed constructions used in land based applications. This standard grades glazing arrangements in three strength bands A to C, where A affords the highest impact resistance. Glazing arrangements (such as a door or window unit) shall pass the test if the pane "breaks safely" or does not break during the test.

1.3.6.5 It is recommended that only units which meet Class A, and are marked as such, are accepted for marine use, noting that in the case of plastics and laminated glasses, preference should be given to constructions which did not break during impact testing. Copies of test certificates specifying the test result should be available from the manufacturers on request.

1.3.6.6 Alternatively, appropriately marked toughened glass panes, strength tested in accordance with BSMA25 or ISO 614, or another applicable standard, may be accepted for use in internal screens/divisions with the recommendation that panes which exceed 0.75 sq.m in area have a minimum thickness of 10 mm and those smaller than 0.75 sq.m have a minimum thickness of 6 mm.

1.3.6.7 In cases where the surveyor is unsure as to the acceptability of proposed internal glazing arrangements, they should refer the case to Headquarters for consideration giving as much detail as possible with respect

to the position, construction and glazing of each item, along with details of any markings or certification supplied by the manufacturer/shipbuilder in support of the proposed construction.