

## **PART 3**

### **NOTES FOR GUIDANCE IN THE APPLICATION OF SCHEDULE 2 OF MSN 1752(M): CONDITIONS OF ASSIGNMENT**

#### **3.1 Interpretation**

**3.1.1** 'Enclosed superstructure': the requirement that the crew shall be provided with an alternative access to the poop or bridge other than through the end bulkhead openings may be satisfied if there are accesses in the superstructure decks and these accesses can be reached from the freeboard deck or from a higher level, e.g. a gangway.

**3.1.2** 'Exposed position': a position within a structure equivalent in strength and weather tightness to an enclosed superstructure is not regarded as exposed.

**3.1.3** 'Weathertight doors': weathertight doors should normally open outwards so as to bear against the door frame under the impact of the sea. Where in exceptional circumstances the doors are permitted to open inwards the framing of the door panel and the securing arrangements of the door will be specially considered.

**3.1.4** Where stores, machinery etc. are loaded while the ship is in port through openings in the bulkheads of an enclosed superstructure, portable sill plates may be permitted provided they are replaced and fitted weathertight before the ship proceeds to sea and the fact is recorded in the ships official logbook.

#### **3.2 Hatchways Closed by Portable Covers and Secured Weathertight by Tarpaulins and Battening Devices**

**3.2.1** Hatch closing arrangements incorporating portable covers, tarpaulins etc. on vessels built to the Merchant Shipping (Load Line) Regulations 1998 impose a freeboard penalty and their use is rare on such vessels. Nevertheless, on any vessel where the hatches are closed by means of portable covers the steel bars or their equivalent as required by the regulations should also be fitted in place before the vessel proceeds to sea.

**3.2.2** The number of ships lost over the years due to hatch covers not being properly secured has clearly indicated the dangers of proceeding to sea without making use of all the hatch locking bars or wire lashings after the tarpaulins have been battened down.

**3.2.3** The precautions referred to above apply equally whether or not deck cargo is carried on or over the hatches.

**3.2.4** At sea Masters and Skippers may of course use their discretion as to the occasions on which they may wish to open the hatches necessary, for example, for ventilation, inspection, cleaning or preparatory work associated with the next working of cargo.

**3.2.5** Masters and Skippers are reminded that the stowing of gangways or accommodation ladders on top of the portable hatch covers is a dangerous practice which can result in damage to the security of the hatches

**3.2.6** Owners, Masters and Skippers are also reminded that proceeding to sea with improperly fitting hatch covers, defective cleats, wedges, battens or tarpaulins constitutes non-compliance with the "Conditions of Assignment" and as such is an offence under Regulation 35(1) of the Merchant Shipping (Load Lines) Regulations 1998

### **3.3 Hatchways Closed by Weathertight Covers of Steel or Equivalent Material Fitted with Gaskets and Clamping Devices (Paragraph 6 of Schedule 2)**

**3.3.1** Where in exceptional circumstances flush hatches are permitted on the freeboard or superstructure decks Surveyors should pay careful attention to their construction and the means of securing weathertight. A searching hose test should be carried out at the installation of the hatch and at the subsequent periodical surveys or after substantial repairs. In type B ships assigned a reduced freeboard under the provisions of paragraph 5(3) of Schedule 4 any flush hatch fitted in position 1 and forward of the quarter length (L/4) should be specially stiffened and in general the section modulus and moments of inertia shall be 15% more than would be required to meet the assumed loads shown in the Table in paragraph 5 of Schedule 2.

**3.3.2** Where hatchways are fitted with coamings of reduced height (i.e. less than 600mm in position 1 or 450mm in position 2) on type B ships assigned a reduced freeboard as above, or any ship in a position forward of the quarter length (L/4) from forward, then the required section modulus and moment of inertia of the covers shall be increased by a factor of up to 15% more than the 8 table in paragraph 5 of Schedule 2, dependent on the magnitude of the reduction in coaming height.

**3.3.3** If it is the intention to carry deck cargo on top of the hatchways special consideration should be given to the strength of the hatchway coamings. Additional strengthening should also be provided when covers are loaded with cargo of a density greater than that represented by the loads assumed in the Table in paragraph 5.

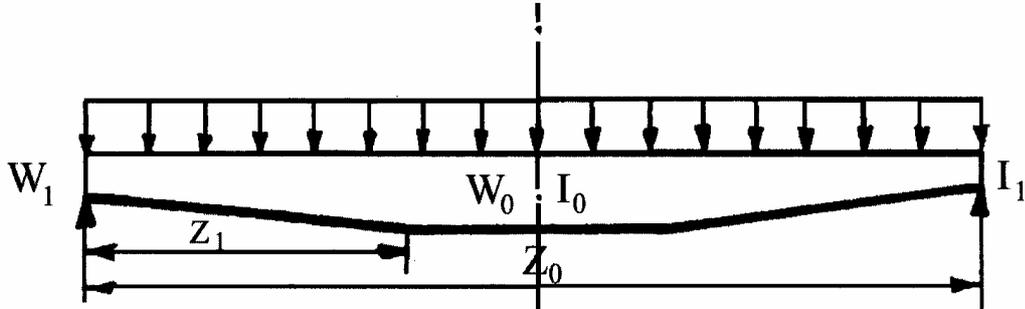
### **3.4 Hatch Beams and Cover Stiffeners of Variable Cross Section**

To avoid stresses and deflections exceeding those given in MSN1752(M), Schedule 2, paragraphs 5(2), (3), (4) and 6(2) along construction elements of variable cross section, the required section modulus calculated as for construction elements of constant cross section is to be increased by factor K expressed by:

$$K = 1 + \frac{3.2\alpha - \gamma - 0.8}{7\gamma - 0.4}$$

where  $\alpha = Z_1 / Z_0$ ,  $\gamma = W_1 / W_0$

The value of factor K obtained by the formula is to be not less than unity.  $Z_1$ ,  $Z_0$ ,  $W_1$ ,  $W_0$  are indicated on the sketch below:



$I_0$  and  $I_1$  are the inertias of the beam at the midspan and the end respectively.  $W_0$  and  $W_1$ , are the depths of the beam at the mid-span and the end respectively.

The moment of inertia is likewise to be increased by the factor C expressed by:

$$C = 1 + 8\alpha^3 \frac{1 - \beta}{0.2 + 3\sqrt{\beta}}$$

$$\text{Where } \alpha = \frac{Z_1}{Z_0} \quad \beta = \frac{I_1}{I_0}$$

The value of factor C obtained by the formulae is to be not less than unity.  $I_1$  and  $I_0$  are indicated on the sketch above.

The use of the above formulae is limited to the determination of the strength of hatch beams and covers in which abrupt changes in the section of the face material do not occur along the length of the beam or cover.

### 3.5 Machinery Space Openings (Paragraph 7)

**3.5.1** In the application of the requirements of sub-paragraph (b) Surveyors should note that where a machinery casing is protected by an enclosed superstructure and the watertight doors to the end bulkheads of the superstructure have sills of 600mm or more, the sills to any access openings in the machinery casing may be of nominal height.

**3.5.2** Where machinery casings are not protected by other structures in Type A ships and Type B ships assigned a reduced freeboard, special arrangements are given in paragraph 17(2)(b) of Schedule 2 (see also paragraph 5(3)(a) of Schedule 4 of MSN 1752(M)). In these cases the second steel weathertight door

should have a sill height of 230mm in conjunction with a 600mm outer door sill.

### **3.6 Miscellaneous Openings in Freeboard and Superstructure Decks (Paragraph 8)**

**3.6.1** The protection of such openings giving access for personnel below decks should be treated as follows:

**3.6.1.1** Generally only doorways in deckhouses which give access below the freeboard or superstructure decks need be protected by weathertight doors. The Surveyor's attention is drawn to paragraph 15(1) dealing with the 'protection of crew'. A deckhouse used for the accommodation of the crew should be of efficient construction and although such a deckhouse may not be protecting an opening in the freeboard or superstructure deck, any door giving access to the deckhouse may need to be of weathertight construction having regard to its position.

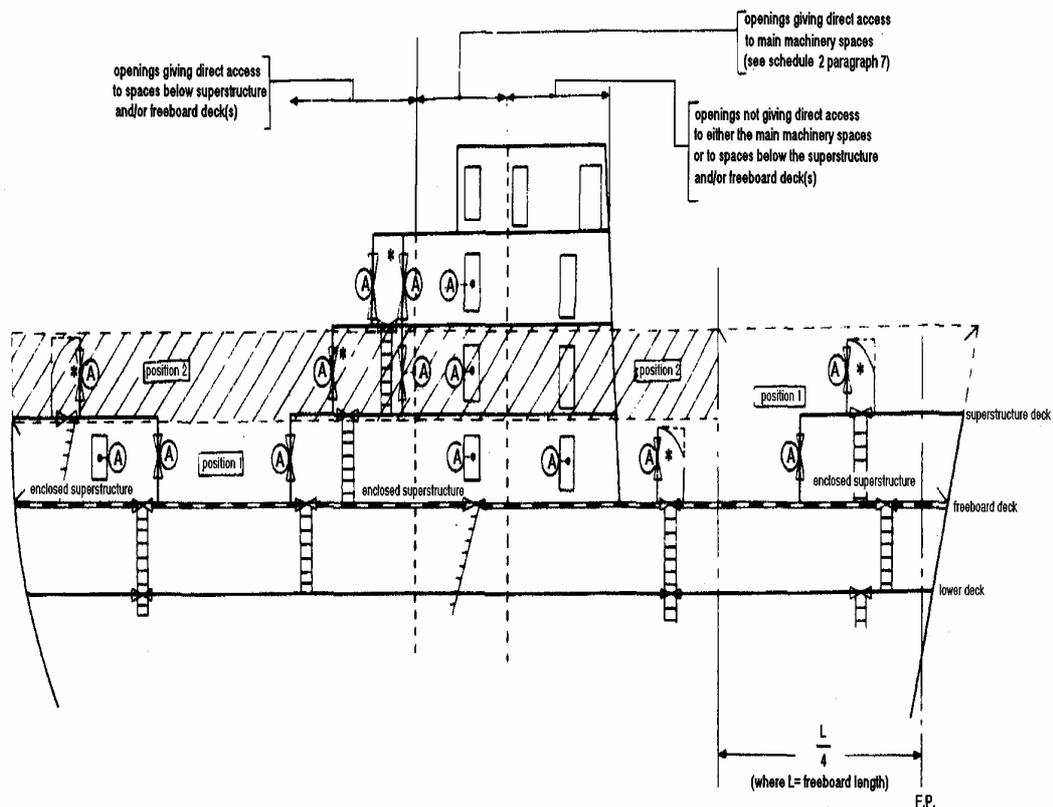
**3.6.1.2** Where deckhouses protect openings in the freeboard or superstructure decks these may be separately protected by properly constructed and efficient companionways within the deckhouse. The access to each companionway should be fitted with a weathertight door and have a sill of appropriate height. In such cases the doors in the boundaries of the deckhouse need not be of weathertight construction nor have a sill of the height prescribed in paragraph 8(3) provided a door of efficient construction is fitted. Typical methods of protecting openings in the freeboard or superstructure decks are given in Figures 1 and 2.

**3.6.2** In the application of Schedule 2 paragraph 8 it is understood that:-

**3.6.2.1** Where access is provided from the deck above as an alternative to access from the freeboard deck in accordance with Schedule 2 paragraph 1 then the height of the sills into a bridge or poop, should be 380mm. The same consideration should apply to deckhouses on the freeboard deck.

**3.6.2.2** Where access is not provided from above, the heights of the sills to doorways in a poop, bridge or deckhouse on the freeboard deck should be 600mm.

**3.6.2.3** Where the closing appliances of access openings in superstructures are not in accordance with Schedule 2 paragraphs 1 and 8, interior deck openings are to be considered exposed, i.e. situated in the open deck.



**Figure 1**

A ship assigned a minimum freeboard and having the freeboard deck as the weather deck should be fitted with weathertight doors as indicated by A

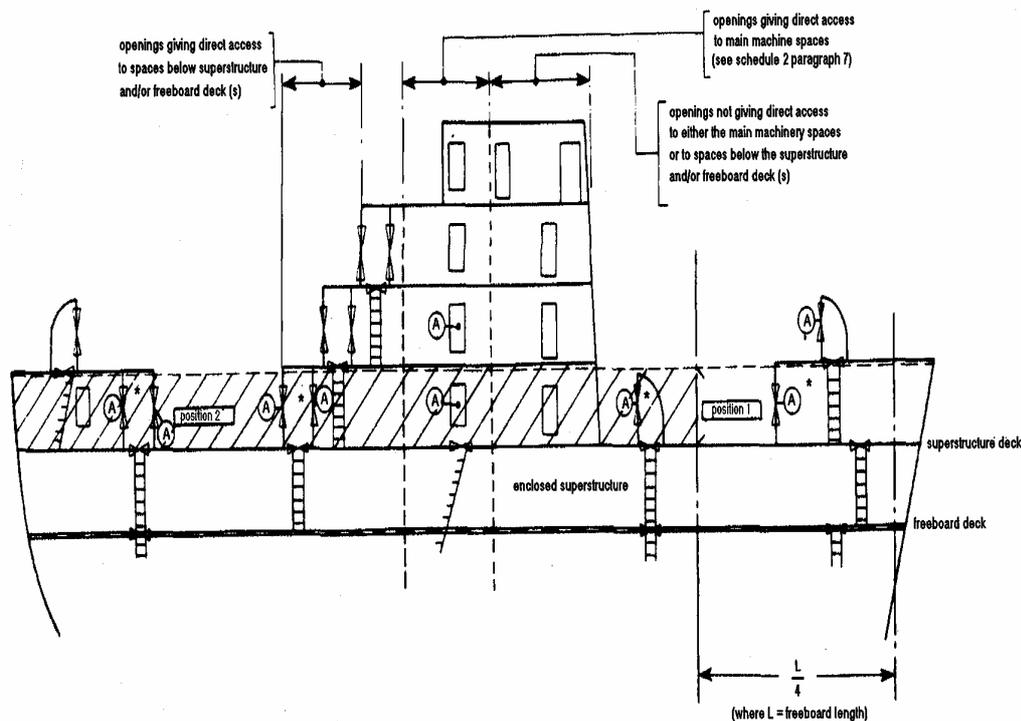
Note:

- (i) doors marked A are required to comply with the requirements of Schedule 2 paragraph 1, and when fitted in Positions 1 and 2 to have sill heights in accordance with Schedule 2 paragraph 8(3).
- (ii) \* indicates enclosed deckhouse or companionway.

**3.6.3** Openings in the top of a deckhouse on a raised quarter-deck or superstructure of less than standard height having a height equal to, or greater than, the standard quarter-deck height should be provided with an acceptable means of closing, but need not be protected by an efficient deckhouse or companionway as described in Paragraph 8(2)(a) provided that the height of the deckhouse is at least the height of a superstructure.

### **3.7 Ventilators (Paragraph 9)**

**3.7.1** In exceptional circumstances where the heights of the coamings prescribed in sub-paragraph (1)(a) may interfere with the working of the ship or if restricted operating conditions permit, a lower height may be approved provided that the Surveyor is satisfied that the closing appliances and other



**Figure 2**

A complete superstructure ship assigned minimum freeboard having the superstructure deck as the weather deck should be fitted with weathertight doors as indicated by A.

Note:

- (i) doors marked A are required to comply with the requirements of Schedule 2 paragraph 1, and when fitted in Positions 1 & 2 to have sill heights in accordance with Schedule 2 paragraph 8(3).
- (ii) \* indicates enclosed deck house or companionway.

relevant circumstances justify a lower height. In this case the closing appliance should comprise a permanently attached steel weathertight cover.

**3.7.2** In ships over 100 metres in length the provision of wood plugs and canvas covers is not acceptable as an efficient closing appliance except in the case of an existing installation whose details are recorded in the FRE 7.

**3.7.3** In ships of 100 meters or less in length, where ventilators are required by paragraph 9(4) to be provided with efficient weathertight covers the various types of ventilator should be treated as follows:

**3.7.3.1** Cowl ventilator coamings should be fitted with a substantial weathertight gasketed steel cover capable of being secured weathertight over the mouth of the coaming by either bolts or toggles upon removal of the cowl. The cover is to be permanently secured by a substantial

keep chain with the provision of stowage of the cover. The bolts or toggles should be spaced 450mm apart in Position 1 and 600mm apart in Position 2; alternatively the cover may have other equivalent means of being secured.

**3.7.3.2** Gooseneck ventilators should be fitted with a permanently attached hinged steel gasketed weathertight flap with screw fastening.

**3.7.3.3** French head ventilators and similar types should be fitted with arrangements to enable all openings, including drain holes, to be closed by a strong steel gasketed cover, permanently attached to the coaming by a substantial steel chain.

**3.7.3.4** Mushroom ventilators should be fitted with gaskets and be capable of being screwed down weathertight.

**3.7.3.5** Where ventilator coamings are fitted in protected positions, e.g. under bulwarks, and it is shown to be necessary to fit coamings of less than rule height on account of the working conditions of the ship, the Surveyor may, if satisfied, accept these arrangements, provided the ventilators are fitted with permanently attached steel weathertight covers.

**3.7.3.6** Ventilators used to exhaust battery rooms or other spaces where explosive mixtures of gases may accumulate must be so arranged that no closing appliance need be fitted i.e. by extending the ventilator coaming to a height where no closing appliance is required.

**3.7.3.7** In general, ventilators necessary to continuously supply the machinery space and, on demand, immediately supply the emergency generator room should have coamings which comply with Paragraph 9 without having to fit weathertight closing appliances.

### **3.8 Air Pipes (Paragraph 10)**

**3.8.1** In ships of 100 metres or less in length air pipes should be provided with hinged gasketed flaps or closing devices of an automatic type. A bonnet type head would be acceptable, where the head could be lowered from the open to the closed position through a shaped slot fitted in the coaming attachment, in which case no gasket need be fitted. Provision should also be made for relieving any pressure/vacuum when tanks are being pumped up/out.

**3.8.2** In ships of over 100 metres in length the provision of wood plugs with keep chains and canvas covers may be accepted in existing installations where the details are recorded on the FRE 7. Otherwise the requirements of paragraph 3.8.1 should be met.

**3.8.3** The means of closing air pipes must be available for immediate use. On ships assigned timber freeboards or designed to carry a full deck cargo where access to the air pipes on the freeboard and/or superstructure decks is difficult,

air pipes should be provided with closing devices of an automatic type as, for example, ball float valves.

**3.8.4** It is important to ensure that all ventilators utilising ball float valves are of a construction that is readily dismantled for inspection of the float and the valve seat.

### **3.9 Cargo Ports and Similar Openings (Paragraph 11)**

**3.9.1** In a ship in which the lower deck has been designated as the freeboard deck, the means of closing openings in the shell plating below the weather deck but above the freeboard deck should be so designed as to ensure integrity against the sea commensurate with the surrounding shell plating, having regard to the position of the opening in relation to the waterline. In such a ship the following principles apply:

**3.9.1.1** the effectiveness of closing appliances fitted at cargo ports and other similar openings in the shell of a ship depends on regular observations and maintenance;

**3.9.1.2** hose tests are a practical means of verifying the weathertightness or watertightness of such closing appliances; and

**3.9.1.3** consideration should be given to the fitting of leakage detection devices in way of doors in exposed positions.

**3.9.2** Stern, bow and side doors of large dimensions, when manual devices would not be readily accessible, are to be normally secured by means of power systems. Alternative means of securing are also to be provided for emergency use in case of failure of the power systems.

**3.9.3** Cargo ports or similar openings below the uppermost Load Line (paragraph 11(3))

If essential for the working of the ship, cargo ports or similar openings may be accepted submerged provided the safety of the ship is unimpaired. The fitting of a second inner door of equivalent strength and watertightness is one acceptable arrangement. In that case a leakage detection device should be provided in the compartment between the two doors. Further, drainage of this compartment to the bilges controlled by an easily accessible screw down valve, should be arranged. The outer door should preferably open outwards.

**3.9.4** References in sub-paragraph 11 (3) to the uppermost load line should be construed as the uppermost seasonal line which in most ships will be the tropical load line or the tropical timber load line whichever is appropriate.

### **3.10 Scuppers, Inlets and Discharges (Paragraph 12)**

**3.10.1** Sub-paragraph (2). Where it is impracticable to fit one automatic non-return valve having positive means of closing from a position or positions above

the freeboard deck, one automatic non-return valve and one sluice valve controlled from a position above the freeboard deck may be accepted.

**3.10.2** Where no secondary means of closing scuppers or discharges is required the storm valve fitted at the ship's side is to be of a substantial back-balanced type or of a type in which the valve face is at an angle not less than 15 degrees to the vertical when closed.

**3.10.3** Where discharges are led overboard through the shell in way of a manned machinery space a locally operated screw down valve or sluice valve fitted at the shell with a non return valve fitted inboard may be accepted as an equivalent arrangement.

**3.10.4** Discharges led overboard from spaces situated below the freeboard deck which are kept closed at sea may be fitted with a screw down valve controlled from above the freeboard deck provided locking arrangements are fitted to prevent inadvertent opening at sea.

**3.10.5** Sub-paragraph (3). Where two automatic non-return valves are fitted the inboard valve must be accessible for examination at all times under service conditions i.e. the inboard valve should be fitted above the level of the uppermost seasonal load line, usually the tropical load line or the tropical timber load line whichever is appropriate. Should this prove impracticable a locally controlled sluice valve positioned between the two automatic non-return valves may be accepted in which case the inboard valve need not be fitted above the uppermost seasonal load line.

**3.10.6** Sub-paragraph (4)(b). In unattended machinery spaces a monitoring system should be provided to warn of a potentially dangerous situation which may arise when water or other liquids are accumulating at an unusually high rate or have reached an unacceptable level in the bilge wells.

**3.10.7** The alarm sensors of such a monitoring system should be fitted in the bilge drain wells or below floor level in single bottom ships and located so that the accumulation of liquids may be detected at normal angles of trim and heel.

**3.10.8** The control of any valve serving a sea inlet, discharge or bilge injection system should be so sited as to allow adequate time for closure in case of influx of water into the spaces, having regard to the time which could be taken to reach and operate such controls. In respect of larger valves, the level to which the space could become flooded with the ship in the fully loaded condition should be borne in mind, and this may require that in some cases remote control or control above the freeboard deck would be required.

**3.10.9** Water closets-manually operated type

**3.10.9.1** In certain types of small craft (e.g. barges and small fishing boats) water closet units of the manually operated pump action type (which usually draw water for flushing purposes directly from the sea) are permitted to be fitted and in such cases Surveyors should ensure that:

(a) the method of closing the soil discharge pipes complies with the requirements of paragraph 12 of schedule 2;

(b) the sea inlet arrangements comply with the requirements of paragraph (b) below;

(c) the supply and discharge pipes are constructed from galvanised heavy gauge steel piping, except in the case of wood ships when solid drawn copper piping may alternatively be used;

(d) where the water closet unit is fitted below the waterline the overboard discharge pipe is looped up to a position at least 0.02L above the uppermost load waterline before being led overboard, and a 6mm (1/4 in) bore anti-siphonage pipe is led from the top of the loop to atmosphere;

(e) a notice giving instructions for use is prominently displayed adjacent to each water closet;

(f) all valves are readily accessible and clearly labelled to indicate their purpose and whether they are open or closed; and

(g) the activating pump within the water closet unit is opened out and fully examined at each periodical inspection. It is essential for the inlet valve within the pump to be seating properly. (Cases have been recorded revealing the presence of marine growth which has prevented positive closure of this valve).

**3.10.9.2** The arrangement for closing the sea inlet pipes will depend upon the operational limits of the ship and the actual location of the water closet as follows:

(a) Sea going ships

For such ships it will be necessary to comply with the requirements of paragraph 12 of Schedule 2. However the following arrangements will be accepted provided they are fitted and seen to operate to the satisfaction of the Surveyor:

(i) Water closets fitted outside machinery spaces. As this type of water closet will not function if a non return valve is fitted to the sea inlet pipe it will be necessary to provide a header tank within the ship to supply water for flushing purposes. The capacity of this header tank should be sufficient to meet the normal demands (i.e. approximately 27 litres (6 gallons) per person per day and should not be less than 55 litres (12 gallons).

(ii) Water closets fitted within a manned machinery space. In this case water for flushing purposes may be drawn directly from the sea provided a screw down valve is fitted to the sea inlet pipe at the shell. The screw down valve should be fitted in a position where it can easily be observed by watch keeping personnel.

(iii) Water closets fitted within an unmanned machinery space. To comply with the requirements of sub-paragraph (a)(ii) above and in addition the provision of an 'efficient warning device' which will indicate at a centralised control position outside the machinery space the presence of any accumulation of water within the machinery space.

(b) Ships employed solely in estuarial service

For such ships when this type of water closet is fitted it may be arranged so that water for flushing purposes can be drawn directly from the sea provided the sea inlet pipe is closed by means of a stopcock fitted at the shell.

**3.10.10** The position of the inboard end of discharges should be related to the timber summer load line when a timber freeboard is assigned, not to the summer load line.

**3.10.11** It is considered that the requirements of Schedule 2 paragraph 12 for non-return valves are applicable only to those discharges which remain open during the normal operation of a vessel. For discharges which must necessarily be closed at sea such as gravity drains from topside ballast tanks, a single screw down valve operated from the deck is considered to provide efficient protection.

**3.11 Side Scuttles and Windows (Paragraph 13)**

**3.11.1.1** Surveyors should note that although this paragraph does not refer to deckhouses it is the intention that if such structures protect openings in the freeboard deck in Position 1 any side scuttles fitted therein should be of the type required for an enclosed superstructure. This requirement shall also apply in the case of first tier deckhouses on the freeboard deck which are considered buoyant in the stability calculations.

**3.11.1.2** Where deckhouses or companionways protect openings in Position 2 any side scuttles and deadlights fitted therein should be of substantial construction. For the purposes of sub-paragraph (3) side scuttles and deadlights should normally be designed in accordance with BS MA 24:1974 or its ISO equivalent. Although the British Standards specification relates to side scuttles which may be fitted close to the load waterline the actual position of the side scuttles must comply with the over-riding requirement of sub-paragraph (2). See also paragraph 2.1.3.4(j) of these Instructions.

**3.11.1.3** For those vessels where the freeboard is reduced on account of subdivision characteristics, side scuttles fitted outside the space considered flooded and which are below the final waterline shall be of the non-opening type.

**3.11.1.4** Although paragraph 13 makes no actual reference to windows they may be fitted in superstructures and deckhouses situated on the freeboard deck provided such structures do not protect openings leading below the freeboard deck. Windows should not be fitted below the freeboard deck, in the first tier end bulkheads or sides of enclosed superstructures and in first tier deckhouses considered buoyant in the stability calculations or protecting openings leading below.

**3.11.1.5** Superstructures fitted with windows are not eligible for a reduction in freeboard and neither they nor deckhouses fitted with windows are to be considered as affording buoyancy for stability purposes (see also paragraph 5.8.1.1).

**3.11.1.6** Windows should normally be designed in accordance with BS MA 25:1973 as amended AMD 2060 July 1976, or its ISO equivalent.

**3.11.1.7** A number of cases have been reported where seamen have been injured by flying glass from windows shattered in heavy seas. In the interests of safety MCA recommends that toughened safety glass should be fitted in the windows of all new ships and of existing ships when renewal of glass becomes necessary. It is strongly recommended that the glass complies British Standards Specification No.MA 25:73, Ship's Windows (as amended), or its ISO equivalent.

**3.11.1.8** To facilitate the use of heating elements laminated toughened safety glass may also be used for windows but the total thickness will need to be greater than that required for an equivalent sized window using toughened safety glass.

**3.11.1.9** The equivalent thickness of laminated toughened safety glass should be determined from the formula:

$$t_{L_1}^2 + t_{L_2}^2 + t_{L_n}^2 = t_s^2$$

n = number of laminates

$t_L$  = thickness of laminates

$t_s$  = thickness of toughened safety glass

e.g. for 14mm laminated toughened safety glass made up from 7mm + 7mm laminates, the nearest  $t_s$  would be:

$$7^2 + 7^2 = t_s^2 = 98$$

$$t_s = \sqrt{98} = 10\text{mm}$$

(minimum preferred standard thickness)

**3.11.1.10** The glazing arrangements should be of adequate strength and the glass should be secured in its frame with suitable edge clearance and in such a manner as to prevent restriction arising from expansion or contraction effects under extreme temperatures.

**3.11.1.11** ISO equivalents to BSMA 24 and 25 are contained in ISO 614,1095,1751,3254 and 3903.

**3.11.1.12** Where an opening in a superstructure deck or in the top of a deckhouse on the freeboard deck gives access to space below the freeboard deck or to a space within an enclosed superstructure and is protected by a deckhouse, then it is considered that only those side-scuttles fitted in spaces which give direct access to an open stairway need be fitted with deadlights in accordance with Schedule 2 paragraph 13. A cabin is considered to provide adequate protection against the minimal amount of water which will enter through a broken side scuttle glass fitted on the second tier.

**3.11.1.13** Sidescuttles and windows in the side shell in the second tier, protecting direct access below or considered buoyant in the stability calculations, should be provided with efficient hinged inside deadlights capable of being effectively closed and secured weathertight.

**3.11.1.14** Deckhouses situated on a raised quarter-deck or on a superstructure of less than standard height may be treated as being on the second tier as far as the provision of deadlights, sidescuttles and windows is concerned, provided that the height of the raised quarter-deck or superstructure on which they are situated is equal to, or greater than, the standard quarter-deck height.

**3.11.1.15** Sidescuttles are defined as being round or oval openings with an area not exceeding  $0.16\text{m}^2$ . Round or oval openings having an area exceeding  $0.16\text{m}^2$  should be treated as windows.

**3.11.1.16** Windows are defined as being rectangular openings generally having a radius at each corner relative to the window size in accordance with recognised national or international standards, and round or oval openings with an area exceeding  $0.16\text{m}^2$ .

**3.11.1.17** Fixed or opening skylights should have glass thickness appropriate to their size and position as required for sidescuttles and windows. Skylight glasses in any position should be protected from

mechanical damage and, where fitted in position 1 or 2, should be provided with permanently attached robust deadlights or storm covers.

### **3.11.2 Adequate strength of bridge windows**

**3.11.2.1** Surveyors should exercise care when examining existing or flagging-in vessels, in particular small vessels converted for offshore standby duties, or vessels with bridge windows forward of 0.25L from the forward perpendicular, noting:

(a) where bridge windows are of a lesser standard than that required, the Surveyor should strongly recommend that all such windows and/or frames are replaced with ones that comply with BSMA 25;

(b) if considered appropriate, such windows may still be accepted as "equivalent" to BSMA 25 on the basis that they have proved "satisfactory in service". However, such an acceptance should always be conditional on an undertaking from the owner that, the event of failure, glasses and/or frames will be replaced with items which comply with the requirements of BSMA 25; and

(c) in no circumstances should inferior glass mounting arrangements, which are not attached to the deckhouse structure (such as rubber "H" sections), be accepted.

**3.11.2.2** In the case of windows in wheelhouses and navigation bridge fronts tinted or polarised glass should not be used, only clear toughened safety glass being acceptable. Anti-glare portable screens may be provided in addition to such glazing.

### **3.11.3 Ships' windows with wooden frames**

Where existing or flagging-in ships are found to have wheelhouse windows featuring wooden frames or with metal frames attached to wooden grounds the Surveyor should ensure that:

**3.11.3.1** all wooden structure should be built, and be maintained in sound condition and free from rot;

**3.11.3.2** wooden parts should be securely attached to surrounding steel structure by means of through bolts and solid washers or backing strips etc. The use of wood screws is not considered to be adequate;

**3.11.3.3** in the case of flagging-in vessels, attending Surveyors should strongly recommend to the owners that wooden frames be replaced by ones complying with BSMA 25;

**3.11.3.4** where wooden frames are accepted, this should be conditional on their operation continuing to prove "satisfactory in service" and on an undertaking from the owner that they will be replaced with frames complying with BSMA 25 in the event of failure; and

**3.11.3.5** alternative means e.g. steel shutters, should be provided for closing any openings in the event of failure of the frame and/or glass.

### **3.12 Freeing Ports and Arrangements (Paragraph 14)**

**3.12.1** The freeing area required for any well should in normal circumstances be directly related (on an area of well basis) to the freeing port area required for a maximum sized well i.e.  $0.7L \times B$  where L and B are the length and breadth of the ship respectively.

**3.12.2** In flush decks ships fitted with a deckhouse amidships of width not less than 80% and having side passages not exceeding 1.5 metres the freeing port area should be based upon the separate lengths of the wells.

**3.12.3** Similarly where a deckhouse on the freeboard deck is fitted with screen bulkheads extending to the sides of the ship so that the exposed deck is effectively divided into wells the freeing port area should be based on the separate lengths of the wells.

**3.12.4** In ships having little or no sheer on the freeboard or superstructure decks the freeing port should be distributed evenly along the length of the wells.

**3.12.5** Wells on raised quarter-decks should be treated as being on freeboard decks.

**3.12.6** Where shutters are fitted to freeing ports the Surveyor should ensure that these shutters can operate freely and comply with the requirements of subparagraph (6).

**3.12.7** Where trunks are fitted which do not comply with the requirements of paragraph 10(2)(b)(vi) of Schedule 4 or where the hatch side coamings are fitted continuously between detached superstructures, the freeing port areas should be specially considered, having regard to the deck area required to be cleared of water.

**3.12.8** For type "A" ships and type "B" ships with trunks a freeing port area, in the lower part of the bulwarks, of 33% of the total area of the bulwarks provides the "other equally effective freeing arrangements" mentioned in Schedule 2 . paragraph 20(1) and may be considered equivalent to the 50% open rails in way of trunks required by Schedule 4 paragraph 10(2)(b)(vi).

**3.12.9** For type "B" ships with freeboards reduced by not more than 60% of the difference between B and A tables there shall be freeing port area in the lower part of the bulwarks equal to at least 25% of the total area of the bulwarks.

**3.12.10** In the case of Offshore Supply Vessels featuring a small freeboard and a long expanse of deck aft of the forecastle without the protection of sheer or

superstructure, particular attention should be paid to the distribution of the freeing port area. This applies particularly at recesses in the forecastle end or elsewhere, and in the ends of pipe deck cargo racks.

**3.12.10.1** Where a recess is made at the end of a forecastle it should be either:

(a) closed by bulkheads across the end and plating over the top;

(b) provided with adequate freeing arrangements in the form of trunks fitted through the sides of the recess; or

(c) if provision is made for wires/cables to pass through the bulkhead to a winch, scuppers should be fitted to drain the recess.

**3.12.11** In the case of ships having open superstructures on the freeboard or superstructure decks, which open to wells formed by bulwarks on the peripheries of the open decks the freeing port areas for the open spaces within the superstructures are to be calculated as follows:-

**3.12.11.1** Determine the required area of freeing ports for the open length of the superstructure in the same way as for a well in accordance with Paragraphs 14(2), 14(3) (a) and (b), and 14(4)(a), (b) and (c), using for (l) the sum of the lengths of the open well and the open length of the superstructure in metres.

**3.12.11.2** Correct this area for the breadth of the openings in the end bulkhead of the open superstructure by multiplying by the factor  $(b_o / l_t)$

where -  $(b_o)$  is the total width of openings in the end bulkhead of the open superstructure in metres, and

$(l_t)$  is the sum of the lengths of the open well and the open length of the superstructure in metres.

**3.12.11.3** Further correct the area for that part of the entire length of well which is enclosed by the open part of the superstructure by multiplying by the factor

$$[1.0 - (l_w / l_t)^2]$$

where  $-l_w$  is the length of open deck enclosed by bulwarks, and  $l_t$  is equal to the sum of the lengths of the open deck enclosed by wells and the length of the common space within the open superstructure.

$l_t$  is equal to the sum of the lengths of the opening deck enclosed by wells and the length of the common space within the open superstructure.

**3.12.11.4** Further correct the area for the distance of the well deck above the freeboard deck, where applicable, by multiplying by the factor  $0.5(h_s/h_w)$

where  $h_w$  is the distance of the well deck above the freeboard deck

and  $h_s$  is one standard superstructure height.

**3.12.11.5** The freeing port area for the open well is determined according to Paragraph 14(3) but using the correction in subparagraph 3.12.11.4 above instead of 0.5 as stated in Paragraph 14(2)(b).

### **3.13 Protection of the Crew (Paragraph 15)**

**3.13.1** The strength of exposed deckhouses on the freeboard deck used for the accommodation of the crew should be equivalent to superstructure end bulkheads.

**3.13.2** Guard rails, wires and/or bulwarks must be provided at the perimeters on all exposed parts of the freeboard and superstructure decks, and Surveyors should ensure that the perimeters of all other decks to which the crew or passengers have access are properly safeguarded. Chains are not permitted as an alternative to wires except where they are fitted in short lengths for access purposes. Surveyors should refer any doubtful cases to Headquarters.

**3.13.3** In cases where deckhouses are resiliently mounted compliance with classification rules will in general satisfy the requirements of paragraph 15.

**3.13.4** Where temporary accommodation units or modules are carried to enhance crew numbers particular attention should be paid to the strength of each unit and its suitability for the marine environment. The attachments to the ship's structure and choice of site onboard should provide the same standards of security and protection for personnel as do the permanent accommodation spaces on board the ship. Where it is agreed by Headquarters that the particular circumstances of the case (e.g. seasonal or geographical limits or weather limitations) justify relaxation of these security and protection standards then a load line exemption certificate should be issued stating:

**3.13.4.1** the period of validity;

**3.13.4.2** the area of operation; and

**3.13.4.3** the weather limitations.

See also paragraph 1.8.

### **3.14 Freeing Arrangements (Paragraph 20)**

**3.14.1** Where gutter bars are installed on the weather decks of tankers in way of cargo manifolds and are extended as far as the after house front for the purpose of containing oil spills on deck during loading and discharge

operations, the free surface effects caused by containment of a cargo spill during liquid transfer operations or of boarding seas while underway require consideration with respect to the ship's available margin of positive initial stability ( $GM_0$ ).

**3.14.2** Where the gutter bars installed are greater than 300 mm in height, they should be treated as bulwarks with freeing ports arranged in accordance with Paragraph 14 and effective enclosures provided for use during loading and discharge operations. Attached closures should be arranged in such a way that jamming cannot occur while at sea, ensuring that freeing ports will remain fully effective.

**3.14.3** On ships without deck camber or where the height of the installed gutter bars exceeds the camber, and for tankers having cargo tanks exceeding 60% of the ship's maximum beam at amidships regardless of gutter bar height, gutter bars should not be accepted without an assessment of the initial stability ( $GM_0$ ) for compliance with the relevant intact stability requirement taking into account the free surface effects caused by liquids contained by the gutter bars.

### **3.15 Gangway and Access (Paragraphs 18, 22, 23 and 24)**

**3.15.1** Gangway and access arrangements should be provided by at least one of the means given in Tables 1 and 2 below:-

Table 1

All ships other than oil tankers, chemical tankers and gas carriers as defined in the Merchant Shipping (Cargo Ship Construction) Regulations 1997, S.I.1997/1509

Locations of access in ship	Assigned summer freeboard	Acceptable arrangements according to type of freeboard assigned:			
		Type A	Type B-100	Type B-60	Type B & B+
1.1 Access to midship quarters	Not more than 3000mm	a	a	a	a
1.1.1 Between poop and bridge, or		b	b	b	
1.1.2 Between poop and deckhouse containing living accommodation or navigation equipment or both	over 3000mm	e	e	c(1) e f(1)	c(1) c(2) c(4) d(1) d(2) d(3) e f(1) f(2) f(4)
1.2 Access to ends	Not more than 3000mm	a	a	a	a
1.2.1 Between poop and bow (if there is no bridge)		b	b	b	
1.2.2 Between bridge and bow, or	Over 3000mm	c(1)	c(1)	c(1)	c(1)
1.2.3 Between a deckhouse containing living accommodation or navigation equipment, or both and bow, or		e	c(2)	c(2)	
1.2.4 In the case of a flush deck ship, between crew accommodation and the forward and after ends of the ship		f(1)	f(1) f(2)	f(1) f(2)	e f(1) f(2) f(4)

Refer to paragraph 3.15.4 for explanation of symbols

Table 2

Oil tankers, chemical tankers and gas carriers as defined in the Merchant Shipping (Cargo Ship Construction) Regulations 1997, 5.1.1997/1509

Location of access in ships	Assigned summer freeboard	Acceptable arrangements according to type and freeboard assigned
		Type A
2.1 Access to bow	not more than $(A_f + H_s)^*$	a e f(1) f(5)
2.1.1 Between poop or bow, or 2.1.2 Between a deckhouse containing living accommodation or navigational equipment, or		
2.1.3 In the case of a flush deck ship, between the crew accommodation and the forward ends of the ship	greater than $(A_f + H_s)^*$	a e f(1) f(5)
2.2 Access to after end  In the case of a flush deck ship, between crew accommodation and the after end of the ship		as required in paragraph 1.2.4 of Table 1 for other types of ships

\* $A_f$  = the minimum summer freeboard calculated as a Type A ship regardless of the type of freeboard actually assigned.

\*  $H_s$  = the standard height of superstructure as defined in paragraph 9(1) of Schedule 4 of Merchant Shipping Notice MSN 1752 (M).

Refer to paragraph 3.15.4 for explanation of symbols

Note: Deviations from some or all of these requirements or alternative arrangements for such cases as ships with very high gangways (i.e. certain gas carriers) may be allowed subject to agreement on a case by case basis.

**3.15.2** For oil tankers, chemical tankers or gas carriers as defined in the Merchant Shipping (Cargo Ship Construction) Regulations 1997 constructed before 1 July 1998, existing arrangements which complied with (b) or (c) may be accepted in lieu of (e) or (f) in the above tables provided such existing arrangements are fitted with shelters and means of access to and from the deck as required for the arrangements (e) or (f) as defined below.

**3.15.3** For tankers less than 100 metres in length, the minimum width of gangway platform or deck level walkway fitted in accordance with arrangement (e) or (f), respectively, may be reduced to 600 mm.

**3.15.4** Acceptable arrangements referred to in the above tables are defined as follows-

(a) A well lighted and ventilated under deck passageway (clear opening 0.8 m wide, 2.0 m high) as close as practicable to the freeboard deck, connecting and providing access to the locations in question.

(b) A permanently and efficiently constructed gangway fitted at or above the level of the superstructure deck on or as near as practicable to the centreline of the ship, providing a continuous platform, at least 600 mm in width and a non-slip surface, with guard rails extending on each side throughout its length. Guard rails should be at least 1 metre high with courses of rails or wires as required by paragraph 15(4) of Schedule 2 of Merchant Shipping Notice MSN 1752 (M), and supported by stanchions spaced not more than 1.5 metres apart; a foot stop should be provided.

(c) A permanent walkway at least 600 mm in width fitted at freeboard deck level consisting of two rows of guard rails with stanchions spaced not more than 3 metres. The number of courses of rails and their spacing should be as required by paragraph 15(4) of Schedule 2 of Merchant Shipping Notice MSN 1752 (M). On Type B ships, hatchway coamings not less than 600 mm in height may be regarded as forming one side of the walkway, provided that between the hatchways two rows of guard rails are fitted.

(d) A 10 mm minimum diameter wire rope lifeline supported by stanchions about 10 metres apart, or a single handrail or wire rope attached to hatch coamings, continued and adequately supported between hatchways.

(e) A permanent and efficiently constructed gangway fitted at or above the level of the superstructure deck on or as near as practicable to the centreline of the ship:

(i) located so as not to hinder easy access across the working areas of the deck;

(ii) providing a continuous platform at least 1 metre in width;

(iii) constructed of fire resistant and non-slip material;

(iv) fitted with guard rails extending on each side throughout its length; guard rails should be at least 1 metre high with course of rails or wires as required by paragraph 15(4) of Schedule 2 of Merchant Shipping Notice MSN 1752 (M) and supported by stanchions spaced not more than 1.5 metres;

(v) provided with a foot stop on each side;

(vi) having openings, with ladders, where appropriate, to and from the deck. Openings should not be more than 40 metres apart;

(vii) having shelters of substantial construction set in way of the I gangway at intervals not exceeding 45 metres if the length of the exposed deck to be traversed exceeds 70 metres. Every such shelter - should be capable of accommodating at least one person and be so constructed as to afford weather protection on the forward, port and starboard sides.

(f) A permanent and efficiently constructed walkway fitted at the freeboard deck level on or as near as practicable to the centreline of the ship having the same specifications as those for a permanent gangway listed in (e) except for foot stops. On Type B ships (certified for the carriage of liquids in bulk), with a combined height of hatch coamings and fitted hatch cover of together not less than 1 metre in height the hatchway coaming may be regarded as forming one side of the walkway, provided that between the hatchways two rows of guard rails are fitted.

**3.15.5** Alternative transverse locations for (c), (d) and (f) above, where appropriate:

**3.15.5.1** At or near the centreline of the ship; or fitted on hatchways at or near the centreline of the ship.

**3.15.5.2** Fitted on each side of the ship.

**3.15.5.3** Fitted on one side of the ship, provision being made for fitting on either side.

**3.15.5.4** Fitted on one side only.

**3.15.5.5** Fitted on each side of the hatchways as near to the centre line as practicable.

Notes:

In all cases where wire ropes are fitted, adequate devices should be provided to ensure their tautness.

Wire ropes may only be accepted in lieu of guard rails in special circumstances and then only in limited lengths.

Lengths of chain may only be accepted in lieu of guard rails if fitted between two fixed stanchions.

Where stanchions are fitted, every third stanchion should be supported by a bracket or stay.

Removable or hinged stanchions should be capable of being locked in the upright position.

A means of passage over obstructions, if any, such as pipes or other fittings of a permanent nature should be provided

Generally, the width of gangway or deck-level walkway should not exceed 1.5 metres.

### **3.16 Timber Freeboards (Paragraph 26)**

Where timber load lines are to be assigned the positions of side scuttles, scuppers, discharges, cargo ports and similar openings should be related to the appropriate timber load line for purposes of determining the standards and the closing arrangements of such features