



INSTRUCTIONS FOR THE GUIDANCE OF SURVEYORS ON
FISHING VESSELS – CHAPTER 3 PART C
FREEBOARD

MSIS27

Rev 10.23



PREFACE

- 0.1 These Marine Survey Instructions for the Guidance of Surveyors (MSIS) are not legal requirements in themselves. They may refer to statutory requirements elsewhere. They do represent the MCA policy for MCA surveyors to follow.
- 0.2 If for reasons of practicality, for instance, these cannot be followed then the surveyor must seek at least an equivalent arrangement, based on information from the owner/operator. Whenever possible guidance should be sought from either Principal Consultant Surveyors or Survey Operation Branch, in order to maintain consistency between Marine Offices.

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RECENT AMENDMENTS

The amendments made in the most recent publication are shown below, amendments made in previous publications are shown in the document Amendment History.

Version Number	Status / Change	Date	Author Reviewer	Content Approver	Next Review Date/Expiry Date
09.21	<ul style="list-style-type: none"> Updated Code to reflect new requirements of MSN1871 Amendment No.2 	31/08/21	D Fenner	G Stone	01/09/2023
11.21	<ul style="list-style-type: none"> Clarify MCA witness tests at inspection Form and content check of approved stability books Sets out requirements for new and existing Razor fishing multihulls 	09/11/21	D Fenner	G Stone	31/10/2023
01.22	<ul style="list-style-type: none"> Clarify an Offset load test can be conducted after a Roll/Heel Test failure. Clarify that where vessel is a Category A vessel, the first step after failing a test is inclining. 	31/01/22	D Fenner	G Stone	31/01/2023
05.22	<ul style="list-style-type: none"> Cat A vessels should be referred to the Technical Panel if they fail Roll Test to decide whether to undergo Offset Load Test or go straight to inclining 	27/04/22	D Fenner	G Stone	31/05/2023
08.22	<ul style="list-style-type: none"> Split Chapter 3 into new sections on Under 15m Vessels, 15m and over vessels and Freeboard, make direct reference to MGN503 for assessing stability of vessels of less than 15m and reference to MSIS27 Chapter 2 for deciding equivalencies for Freeboard 	01/07/22	D Fenner	G Stone	01/07/24
11.22	<ul style="list-style-type: none"> Vessels which meet the freeboard/positive clear height at side, waterfreeing requirements and stability requirements of MSN1871 	28/11/22	D Fenner	G Stone	28/11/24

	Amendment 2 shall only have any restrictions applied as set out in MSN1871 Amendment No.2				
12/22	<ul style="list-style-type: none"> Surveyors should refer to Sections 1.23 and 1.24 of MSIS27 Chapter 1 when reviewing modifications to vessels. 	12/22	D Fenner	G Stone	28/11/24
10/23	<ul style="list-style-type: none"> Authorised FVCAs shall provide attestation to MCA when witnessing freeboard verification on new build fishing vessels of less than 12m RL 	11/23	D Fenner	L Page	30/11/24

MSIS27 Chapter 3

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INTRODUCTION

3.1 FREEBOARD

3.1.1 INTRODUCTION

3.1.1.1 This chapter should be read in conjunction with [MSIS27.3 Parts A and B](#), [MSIS27 Chapter 2 sections 2.25, 2.26 and Annexes 1 and 2](#), Chapter 3.11 and 3.12 of MSN 1871 Amendment No.2, Chapter 3.2 of [MSN 1872](#) 'Fishing Vessels 15m length overall to 24m registered length Code of Practice' (15-24m Code) and Chapters 3.2 and 6.1.3 of [MSN 1873](#) 'Fishing Vessels Over 24m registered length Code of Practice' (Over 24m Code).

3.1.1.2 Freeboard is defined as the vertical distance between the deck edge, or gunwale top in open boats, and the waterline at any point along the vessel's length.

3.1.1.3 It is a very important design parameter. Inadequate freeboard is hazardous and degrades safety in the following ways:

- By reducing stability;
- By reducing the protection for the crew working on the weather deck;
- By lowering the points at which water can flood into the interior of the vessel;
- By reducing the reserve of buoyancy at the bow which is needed to raise the vessel's head in a seaway; and
- By increasing the possibility of the vessel being "pooped" in following seas.

3.1.1.4 [Surveyors should refer to Sections 1.23 and 1.24 of MSIS27 Chapter 1 when reviewing modifications to vessels.](#)

3.2 [MSN1871 AMENDMENT NO.2](#)

3.2.1 Freeboard for New Vessels (2021) or vessels wishing to join the Register after 6 September 2021. See also Annex 8 of [MSN1871 Amendment No.2](#).

3.2.2 Decked and Open vessels are to comply with the requirements as set out in Annex 8 of [MSN1871 Amendment No.2](#).

3.2.3 Open vessels are to be limited in their area of operation to 20 miles from a safe haven and in favourable weather conditions.

3.2.4 Decked vessels with freeboard less than 300 mm are to be limited in their area of operation to 20 miles from a safe haven and in favourable weather conditions. The minimum freeboard should be at least 200mm. Vessels with less than 200mm Freeboard are to be considered Open Vessels.¹

¹ Where the freeboard is less than the minimum freeboard indicated, where equivalence can be demonstrated the MCA may accept alternative arrangements.

- 3.2.5 The Freeboard and Positive Clear Height at side must be measured at every renewal inspection and must not be below the minimum levels set out in Annex 8 of [MSN1871 Amendment No.2](#).
- 3.2.6 Vessels which meet the freeboard/positive clear height at side, waterfreeing requirements and stability requirements of MSN1871 Amendment 2 shall only have any restrictions applied as set out in MSN1871 Amendment No.2
- 3.2.7 For vessels that do not meet minimum requirements for freeboard or positive height at side, refer to sections 2.25, 2.26 and Annexes 1 and 2 of MSIS27 Chapter 2.
- 3.2.8 Surveyors should be particularly cautious in the inspection of vessels, such as dories, having an inner GRP moulding creating a closed and buoyant space between it and the hull moulding. Holes cut through the inner moulding for engine control cables for example, or screws securing a metal keel band to the bottom of the hull and which penetrate the thickness of the outer moulding, can allow water to leak into the void between the inner moulding and the hull moulding. This can reduce freeboard (due to the weight of the “hidden” water) and can de-stabilise the vessel causing it to capsize (due to the free surface of the “hidden” water). Owners should be advised of this hazard, which has been a factor in a number of fatal accidents, with the recommendation to monitor the freeboard of their vessel to ensure that no “hidden” flooding is occurring.
- 3.2.9 Sections 3.3.6 to 3.3.18 below of this Chapter shall also be taken into consideration when considering the freeboard of fishing vessels of less than 15m LOA.
- 3.2.10 FVCA Authorised Surveyors will provide attestation when they have witnessed minimum loaded freeboard verification for new build fishing vessels of less than 12m RL which has been carried out successfully and in accordance with the requirements of MSN 1871, Amendment 2 (F) and supporting guidance.
- 3.2.11 The Vessels Freeboard shall be recorded on the Small Fishing Vessel Certificate.
- 3.3 MSN 1872 AND MSN 975**
- 3.3.1 The guidance presented in this section is definitive for vessels constructed to comply with [MSN 1872](#).
- 3.3.2 For new vessels (i.e. those with a keel laying date on or after 23 November 2002) chapter 3.2 of [MSN 1872](#) sets out the requirements for minimum freeboards - at the forward perpendicular; at any point along the freeboard deck edge; and at the aft perpendicular. These requirements are shown graphically in the annex to this section (Annex A paragraphs 10 to 17).
- 3.3.3 Existing vessels (i.e. those with a keel laying date prior to 23 November 2002) built to comply with [MSN 975](#) should continue to be surveyed under that standard with

any approved “reductions or equivalencies” against that standard which are recorded in the vessel’s CM files / SharePoint Stability file.

- 3.3.4 It is now the common practice for existing vessels in this size range to adopt the freeboards set out in [MSN 1872](#). Where this is done the minimum freeboard of 300mm should be applied, as it would be on a new vessel.
- 3.3.5 The practical application of [MSN 975](#) to vessels built prior to May 1980 is based on (the now deleted) Survey Memorandum (SM) 55. This permitted a percentage reduction in the forward and aft freeboards of 5% and 20% respectively. These allowances are implicit in the freeboards calculable under [MSN 1872](#) (as the table in Annex A, Paragraph 11 shows) so no similar deductions should be applied to freeboards calculated using [MSN 1872](#).
- 3.3.6 **Scantling draught** - it is important when minimum freeboards are set to ensure that the corresponding draughts do not exceed the scantling draught (i.e. that draught used in determining the hydrostatic pressure loading for the design of the vessel’s bottom and side structure). This can become problematic when vessels are subject to a major modification. Vessels designed to Seafish Structural Rules prior to 21 July 2020 and to the Construction Standards contained in [MGNs 628](#) or [629](#) from that date forward would be unaffected (unless the modification involves lengthening or moving the freeboard deck) since draught does not appear as a parameter in the formulae for side and bottom structures. If the vessel was built to classification society rules or the standards of another national administration greater care needs to be taken. If the vessel is still in class the owner should be requested to obtain confirmation from the class society on the scantling draught; if not then the surveyor should request that the owner gets his consultant to produce calculations using the classification society rules in support of the maximum operating draught.
- 3.3.7 **Flush deck vessels** – for a fishing vessel without any enclosed superstructures on its freeboard deck (i.e. a flush deck vessel with 1m high protective bulwarks at the bow extending at least 15% of the LBP aft of the FP) the determination of freeboard is straightforward (see Annex A, Paragraph 10). It is governed by three parameters: the minimum freeboard at any point along the freeboard deck, H_{min} ; the minimum bow height, H_{fmin} ; and the minimum freeboard aft, H_{amin} . The minimum freeboards forward and aft are applied at the fore and aft perpendiculars respectively. The fore and aft perpendiculars are located at the forward and aft ends of the length between perpendiculars as defined in 1.2.36 of [MSN 1872](#) (which is the ITC’69 and Load Line Convention definition). [Note where the bulwarks are less than 1m high the freeboard must be increased, but where they are greater than 1m high no relaxation in minimum freeboard is permitted.]
- 3.3.8 **Weathertight foc’sle** - provided the foc’sle is weathertight (i.e. its aft end is closed by a bulkhead fitted with a weathertight door) and it extends back from the forward perpendicular by at least 7% of the LBP then H_{fmin} can be measured from the

foc'sle deck at side instead of from the freeboard deck (see Annex A, Paragraph 10). The freeboard at the aft end of the foc'sle must exceed Hmin (300mm).

- 3.3.9 **Weathertight shelters** – built over the freeboard deck, if fully weathertight (i.e. enclosed as defined in 1.2.22 of [MSN 1872](#)) and at least 1.8 metres in height above the freeboard deck would be considered to be enclosed superstructures. The minimum freeboard of 300mm should be maintained, if practicable, over the full length of weathertight shelters to provide for easy drainage of the enclosure through non-return valves at deck level. Where deck level non-return valves would be immersed at an angle of heel of 10° or less in any loading condition the freeboard should be increased or powered drainage pumps, discharging from a point high in the side of the shelter, must be used; and the non-return valves removed and their openings sealed. All doors and hatches in the weather tight boundary of the shelter are to be marked “Keep closed at sea”.
- 3.3.10 **Non-weathertight shelters** - although providing enhanced protection to the crew working on deck in comparison to working on the weather deck, are still open to the sea. Some arrangements incorporating stern or side hatches for fishing operations can lead to stability issues following a sudden influx of water filling the space; so freeing ports for such spaces require additional area (see Chapter 2) or stability calculations should allow for water on deck criteria to be met with flooding up to the lower edge of the opening. In order to facilitate rapid draining of such spaces the minimum freeboard of 300mm to the working deck at side must be maintained over the length of the shelter.
- 3.3.11 **Freeboard deck** - [MSN 1872](#) gives the definition of “freeboard deck” as ***the lowest complete deck above the deepest operating waterline from which fishing is undertaken***. The term “freeboard deck” derives from the Load Line Convention where it is the weathertight “lid” on the watertight hull, which is assumed to be always above the deepest loaded waterline at any point along its length. But fishing vessels, unlike ships operating under the load line convention, have been permitted in certain circumstances (see the following paragraphs) to have the lowest point on the freeboard deck (where it is enclosed in a weathertight superstructure) lying at the level of the deepest loaded waterline (i.e. giving zero freeboard at that point). **Note** - in no circumstances should exposed freeboard decks at any point along their lengths have less than the required minimum freeboard set out in 3.2.3 of [MSN 1872](#) (i.e. 300mm).
- 3.3.12 [MSN 1872](#) para 3.2.8 – requests for reduced freeboard in way of weathertight shelters need to be specially considered and should be discussed with the Consultant Surveyor (FV) and the Stability and Plan Approval Unit. The basic principles to be considered in evaluating these requests for such working decks (net bins will be considered in the section on over 24m fishing vessels) are as follows:

- **Strength** – are the hull and shelter scantlings adequate for the operating draughts proposed (construction requirements for weathertight shelters are outlined in [MGN 628](#) and [MGN 629](#)).
- **Drainage** – what arrangements are proposed for draining the weathertight shelter? With low freeboards (less than 300mm, or where deck level scuppers would be immersed at an angle of heel of 10° in any loading condition, whichever is most onerous) powered drainage pumps must be used, discharging from a point high in the side of the shelter. A simple non-return valve in the side of the shelter (see Chapter 2) would be ineffective and, if defective (they are often found on survey seized open), would allow flooding into the shelter destroying its buoyancy and hence severely reducing the vessel's stability.
- **Vulnerability to flooding.**
 - **Access** – the coaming heights of doors and hatches will need special consideration and may require to be increased in height to compensate for the overall deficit of freeboard.
 - **Ventilators and air pipes** – the heights of ventilators and air pipes will need special consideration and may require to be increased in height to compensate for the overall deficit of freeboard.
 - **Openings for fishing gear** – not permitted in a weathertight shelter except for small openings (less than 100cm²) through which wires/warps pass (see 3.10.7 and 3.10.18 of MSIS27 Chapter 3 Part B of this Chapter, paragraph 2.2.1.8 of [MSN 1872](#) Amndt. 1 (F), and paragraph 2.2.1.8 of [MSN 1873 Amndt. 1 \(F\)](#)).
 - All doors and hatches in the weather tight boundary of the shelter are to be marked “Keep closed at sea”.

3.3.13 Requirements applicable to commonly encountered situations involving weathertight shelters are presented in the paragraphs immediately following.

3.3.14 **Vessels with a weathertight poop** (Annex A, paragraph 12) should meet the following minimum freeboard requirements:

- The weathertight shelter should be full width and extend from the stern to a point at least one fifth of the length between perpendiculars (LBP / 5) forward of the Aft Perpendicular, AP.
- It should be fully weathertight without any side or stern openings, or weather deck openings which are required to be used at sea except weathertight doors and hatches for crew access only. Any such door would need to be permanently marked to indicate it is to be kept closed at sea.
- All access openings in the shelter deck should have coaming heights not less than 460mm (as if fitted in the main deck, 2.2.4.1 of [MSN 1872](#)), but where the shelter deck is at a height greater than $H_{min} + 1.8$ metres above the deepest operating waterline at the aft perpendicular the deck may be treated as a first tier superstructure and the minimum coaming height reduced to 100mm (2.2.4.1 of MSN 1872).
- All ventilators and air pipes on the shelter deck should have a minimum height of 760mm (as if fitted in the main deck 2.2.7.1 and 2.2.8.1 of [MSN 1872](#)), but where the shelter deck is at a height greater than $H_{min} + 1.8$ metres above

the deepest operating waterline at the aft perpendicular the deck may be treated as a first tier superstructure and the minimum heights reduced to 450mm (2.2.7.1 and 2.2.8.1 of [MSN 1872](#)).

- The minimum aft freeboard, H_{\min} , may be measured from the shelter deck at the aft perpendicular if the conditions stipulated in the previous bullet points are met.
- Where the weathertight shelter is less than LBP/5 in length but greater than 0.07xLBP in length, then the freeboard may continue to be measured from the shelter deck but the minimum aft freeboard should be at least $H_{\min} + H_s (0.2 - L_s / LBP) / 0.13$ in height. Where H_s is the height of the WT shelter at the aft perpendicular and L_s is the length of the WT shelter.
- The minimum freeboard, $H_{\min} = 300\text{mm}$ should be met on the exposed main deck.

3.3.15

Vessels with a weathertight shelter mid-length (Annex A, paragraph 13) should meet the following minimum freeboard requirements:

- Minimum freeboard requirements at bow, stern and the lowest points on the exposed main deck should meet in full the requirements of [MSN 1872](#) paras 3.2.1 to 3.2.7 inclusive.
- The shelter should be fully weathertight without any side or weather deck openings which are required to be used at sea except weathertight doors and hatches for crew access only.
- All doors and hatches in the weather tight boundary of the shelter are to be marked “Keep closed at sea”.
- The number of weathertight doors in the forward and aft bulkheads should be kept to the practicable minimum. All should have coaming heights not less than 460mm (2.2.4.1 of [MSN 1872](#)).
- All exposed access openings in the shelter deck should have coaming heights not less than 460mm (as if fitted in the main deck, 2.2.4.1 of [MSN 1872](#)), but where the shelter deck is at a height greater than $H_{\min} + 1.8$ metres above the deepest operating waterline throughout its length the deck may be treated as a first tier superstructure and the minimum coaming height reduced to 100mm (2.2.4.1 of [MSN 1872](#)).
- All ventilators and air pipes on the shelter deck should have a minimum height of 760mm (as if fitted in the main deck 2.2.7.1 and 2.2.8.1 of [MSN 1872](#)), but where the shelter deck is at a height greater than $H_{\min} + 1.8$ metres above the deepest operating waterline throughout its length the deck may be treated as a first tier superstructure and the minimum heights reduced to 450mm (2.2.7.1 and 2.2.8.1 of [MSN 1872](#)).
- If the foregoing conditions are met a zero minimum freeboard would be permitted within the length of the shelter.
- Where the shelter is used as a fish processing space there may be a flooding hazard. Therefore, any opening within the shelter leading below deck should be protected by a full height (460 mm) coaming 2.2.4.3 of [MSN 1872](#)(F) refers. This is of particular importance where submersible pumps are fitted in lieu of non-return valves in the sides of the shelter. The comment in section 3.3.12 above of this Chapter on drainage will also apply.

3.3.16

Vessels with a weathertight shelter extending back from the stem to an exposed stern deck (Annex A paragraph 14) should meet the following minimum freeboard requirements:

- **where weathertight doors are fitted in the aft bulkhead or the shelter does not extend 85% of the LBP aft of the forward perpendicular.**
 - Minimum freeboard requirements at bow, stern and the lowest point on the exposed main deck should meet in full the requirements of [MSN 1872](#) paras 3.2.1 to 3.2.7 inclusive.
 - The shelter should be fully weathertight without any side or weatherdeck openings which are required to be used at sea except weathertight doors and hatches for crew access only. These access openings are to be marked “Keep closed at sea”.
 - The number of weathertight doors in the aft bulkhead should be kept to the practicable minimum. All should have coaming heights not less than 460mm (2.2.41 of [MSN 1872](#)).
 - All exposed access openings in the shelter deck should have coaming heights not less than 460mm (as if fitted in the main deck, 2.2.41 of [MSN 1872](#)), but where the shelter deck is at a height greater than Hamin + 1.8 metres above the deepest operating waterline at the aft perpendicular (to an imaginary extension to the shelter deck parallel to the freeboard deck) the deck may be treated as a first tier superstructure and the minimum coaming height reduced to 100mm (2.2.4.1 of [MSN 1872](#)).
 - All ventilators and air pipes on the shelter deck should have a minimum height of 760mm (as if fitted in the main deck 2.2.7.1 and 2.2.8.1 of [MSN 1872](#)), but where the shelter deck is at a height greater than Hamin + 1.8 metres above the deepest operating waterline at the aft perpendicular (to an imaginary extension to the shelter deck parallel to the freeboard deck) the deck may be treated as a first tier superstructure and the minimum heights reduced to 450mm (2.2.7.1 and 2.2.8.1 of [MSN 1872](#)).
 - Where the shelter is used as a fish processing space there may be a flooding hazard. Therefore, any opening within the shelter leading below deck should be protected by a full height (460 mm) coaming 2.2.4.3 of [MSN 1872](#)(F) refers. This is of particular importance where submersible pumps are fitted in lieu of non-return valves in the sides of the shelter. The comment in section 3.3.12 above of this Chapter on drainage will also apply.
- **B) where aft bulkhead has no openings and the shelter extends at least 85% of the LBP aft of the forward perpendicular and the crew require no access to the exposed aft deck at sea for operational reasons.**
 - Minimum freeboard requirements at bow, and at the stern (to an imaginary extension to the shelter deck parallel to the freeboard deck) should meet in full the requirements of [MSN 1872](#) paras 3.2.4 to 3.2.7 inclusive.
 - The shelter should be fully weathertight without any side or end openings.
 - The aft bulkhead and exposed aft deck should be as strong as the hull in that area.

- All exposed access openings in the shelter deck should have coaming heights not less than 460mm (as if fitted in the main deck, 2.2.4.1 of [MSN 1872](#)), but where the shelter deck (imaginary line) is at a height greater than $H_{amin} + 1.8$ metres above the deepest operating waterline at the aft perpendicular the deck may be treated as a first tier superstructure and the minimum coaming height reduced to 100mm (2.2.4.1 of [MSN 1872](#)).
- All ventilators and air pipes on the shelter deck should have a minimum height of 760mm (as if fitted in the main deck 2.2.7.1 and 2.2.8.1 of [MSN 1872](#)), but where the shelter deck (imaginary line) is at a height greater than $H_{amin} + 1.8$ metres above the deepest operating waterline at the aft perpendicular the deck may be treated as a first tier superstructure and the minimum heights reduced to 450mm (2.2.7.1 and 2.2.8.1 of [MSN 1872](#)).
- Air pipes on the exposed aft deck should have their heights increased by the deficit in H_{amin} measured from the exposed aft deck at the AP.
- Machinery space ventilators should not open onto the exposed aft deck. Other ventilators should have their heights increased by the deficit in H_{amin} measured from the exposed aft deck at the AP.
- Where the shelter is used as a fish processing space there may be a flooding hazard. Therefore, any opening within the shelter leading below deck should be protected by a full height (460 mm) coaming 2.2.4.3 of [MSN 1872](#)(F) refers. This is of particular importance where submersible pumps are fitted in lieu of non-return valves in the sides of the shelter. The comment in section 3.3.12 above on drainage will also apply.
- While the freeboard to the exposed deck could be zero at any point the deck must not be submerged.
- The logic to this decision is that the freeboard deck is effectively terminated by the watertight bulkhead at the aft end of the shelter. The bulkhead and the exposed deck should be of equivalent strength to the hull so there is no weakness in the vessel's watertight "skin".

3.3.17

Vessels with an enclosed non-weathertight stern aft of a weathertight shelter with stern openings (Annex A, paragraph 15) should meet the minimum freeboard requirements applicable to a vessel with an open stern over the length of the stern enclosure. The reason for this is that enclosed sterns of this type, while providing enhanced shelter for the crew working the fishing gear, are vulnerable to pooping. In extreme circumstances this can lead to the entrapment of large volumes of water which can migrate to other parts of the vessel and could lead to its loss. A number of vessels have been lost in this way. Consideration should be given to the following:

- The forward bulkhead of the enclosure should be full width and watertight without any openings except for a single weathertight door for crew access which should ideally be located on the centre-line. It should have a sill height of at least 460mm, preferably 600mm. It should be marked "Keep Closed at sea."

- The number of openings in the watertight deck should be kept to a minimum and protected by a coaming of at least 460mm height fitted with a weathertight hatch.
- Machinery space ventilators or access openings should not be positioned within the enclosure.
- Portholes looking out onto the enclosure should be of a non-opening type.
- Air pipes within the enclosure should have the lower edge of their goose neck or bend at least 760mm above the deck.
- Since substantial quantities of water could flood the enclosure if the vessel is pooped it should be demonstrated that the vessel is able to survive with the enclosure flooded up to the lower edge of the transom openings (to be placed not less than 1000mm above the deck); or the freeing port areas increased to prevent such an occurrence. The calculations for trapped water on deck should be carried out as detailed in Chapter 3.1 of [MSN 1873](#).

3.3.18

[MSN 1872](#) para 3.2.9 - Requests for reduced freeboard for vessels with particular modes of operation may be specially considered if the application of the minimum freeboard criteria are considered to be incompatible with that specific mode of fishing, provided that equivalent safety is maintained. Such requests should be discussed with the Consultant Surveyor (FV) and the Stability and Plan Approval Unit. The basic principles to be considered in evaluating these requests are as follows:

- **Strength** – are the hull and shelter scantlings adequate for the operating draughts proposed?
- **Drainage** – what arrangements are proposed for draining weathertight and non-weathertight shelters?
- **Vulnerability to flooding.**
- **Access** – the coaming heights of doors and hatches will need special consideration and may require an increase in height to compensate for the overall deficit of freeboard, or moved to a less exposed location.
- **Ventilators and air pipes** - the heights of ventilators and air pipes will need special consideration and may require an increase in height to compensate for the overall deficit of freeboard, or moved to a less exposed location.
- **Stability** – can the vessel withstand the flooding of any non-weathertight enclosure up to the lower edge of any large openings?
- **Protection of the crew** – are the crew adequately protected against waves breaking onto the deck?

3.4 MSN 1873 AND MSN 975

3.4.1

The freeboard requirements for fishing vessels more than 24m in registered length are contained in [MSN 1873](#), which has amplified the freeboard requirements in chapters III/R12+R13 and chapter VI/R3(2) of the Torremolinos Protocol. The Code applies to both existing vessels (i.e. those with a keel laying date prior to 1 January 1999) and new. However, to avoid any possibility of conflicting requirements, existing vessels built to comply with [MSN 975](#) should continue to be

surveyed under that standard with any approved “reductions or equivalencies” against that standard which are recorded in the vessel’s CM files / SharePoint stability file. But if such vessels undergo a “major conversion” (see 1.2.61 of [MSN 1873](#)) the freeboard requirements set out in the Code should be applied.

- 3.4.2 **Minimum freeboards.** The minimum freeboard for this class of vessel is not explicitly prescribed in the Torremolinos Protocol; it has to be deduced from considerations of the minimum bow height required to prevent the excessive shipping of water, the maximum draught at which the stability criteria can be met and the safety of crew working on the weather deck), which can be found in [MSN 1873](#) 3.1, 3.2 and 6.1.3 respectively.
- 3.4.3 If the vessel is classed it is likely that a minimum freeboard will be set by class for the issue of the fishing vessel class notation. For example, DNV would require a freeboard mark on both sides amidships in the form of a horizontal line (450mm long and 25mm high) annotated with the letters ‘NV’. This mark sets an upper limit on the vessel’s draught from both strength and stability. It should not be immersed in any condition.
- 3.4.4 Where a vessel is not classed, the MCA will need to be satisfied that the vessel’s structure is adequate for the intended draught. This may include confirming that the hull scantlings were constructed and have been maintained to an appropriate standard. Any proposed increase in draught / reduction in freeboard for an unclassed vessel would need to be supported by demonstrating that the vessel’s structure was suitable for such an increase.
- 3.4.5 The minimum acceptable freeboard for a working deck which is also the weather deck will be greater than that required for a working deck which is within a weathertight shelter because in the latter case the protection of the crew from the sea is provided, not by freeboard, but by the shelter.
- 3.4.6 For new [1999] vessels only (i.e. vessels with a keel laying date on or after 1 January 1999), the minimum freeboard at the working deck edge measured amidships is calculated from the formula in 6.1.3.4 of the Code. It should not be less than 300mm or that allowable by the vessel’s maximum approved operating draught, whichever is the greater.
- 3.4.7 For new [2003] vessels only (i.e. vessels with a keel laying date on or after 1 January 2003), the minimum freeboard at the working deck edge measured amidships is calculated from the formula in 6.1.3.4 of the Code. It should not be less than 300mm or that allowable by the vessel’s maximum approved operating draught, whichever is the greater.
- 3.4.8 For new [2003] vessels only (i.e. vessels with a keel laying date on or after 1 January 2003), the minimum freeboard at a working deck inside a weathertight shelter can be allowed to be zero, but no lower (Classification Society Rules would not permit this, for example see DNV Rules for the Classification of Ships Part 5 Chapter 6 Fishing Vessels at [exchange.dnv.com](#)).

- 3.4.9 For other vessels the freeboard heights to working decks which are also weather decks is calculated from the formulae relating freeboard height to a 1 in 20 encounter frequency of shipping water onto the deck (see Chapter 6.1.3.3 of the Code). Such vessels should continue to be surveyed under the standard agreed at the time of build which is recorded in the vessel's CM files / SharePoint vessel file and approved stability book; ensuring that the maximum approved operating draughts are not exceeded.
- 3.4.10 There is one exception to these general requirements and that concerns net bins. These structures are effectively spaces appended to the vessel which fall outside of the freeboard requirements because: a) the crew does not need access to the space at sea; b) the boundaries of the net bin are as strong as the ship's hull; and c) the boundaries of the net bin are watertight like the ship's hull i.e. there are no openings to the interior of the hull (such as hatches, ventilators or air pipes) from inside a net bin. For such structures the freeboard can be a minimum of zero (usually at the forward boundary of the space, see Annex A, paragraphs 16 and 17), subject to adequate drainage being provided. If the drainage is not considered to be adequate the vessel's stability should be assessed with the net bin full of water.
- 3.4.11 **Minimum bow heights.** The required bow height is defined in the Code as 'the minimum vertical distance from the deepest waterline to the top of the highest exposed deck [at side] measured at the forward perpendicular'. The design bow height should exceed the calculated minimum bow height. Bow height is measured to the weather deck not to the top of the bulwarks [Note - This guidance differs from recommendation 4(4) of the Torremolinos Convention which permits the bow height to be measured from the top of a bulwark extending at least 0.15 LBP aft of the FP, up to 1 metre in height; but it is consistent with [MSN 975](#) and should be followed].
- 3.4.12 The Code provides for two situations a) where fish is passed into the fish room through a hatch on the working deck which is also the weather deck, and b) where fish is passed into the fish room through a hatch on a working deck which is protected by a weathertight shelter.
- 3.4.13 In case a) the minimum bow height is calculated from the formulae given in Chapter 3.2.1.1 of the Code. Where the bow is fitted with a weathertight foc'sle (see Annex A paragraph 10) the design bow height is measured from the top of the foc'sle deck at side at the FP. The foc'sle must be weathertight for a distance of at least 7% of LBP aft of the FP i.e. it must have a bulkhead at its aft end in which all openings are fitted with weathertight closing appliances. [Note - This guidance differs from recommendation 4(3) of the Torremolinos Convention which permits 'open' foc'sles but it is consistent with [MSN 975](#) and should be followed]. In a flush deck vessel fitted with 1 metre high bulwarks, where the design bow height is achieved by sheer, the sheer should extend at least 15% of LBP aft of the FP.

- 3.4.14 In case b) for new (2003) fishing vessels the minimum bow height should be calculated using the International Loadline Convention 1966 as modified by the 1988 Protocol (regulation 39 of Annex 1), but it is not to be less than 2000mm. Please note that, depending on the form of the weathertight shelter, the point from which the minimum bow height is measured could be below the actual weather deck at side at the FP (see Annex A paragraph 18 which is reproduced from ILLC'66). The minimum bow height should be ensured by stipulating the corresponding maximum forward draught rather than the freeboard at the bow. Existing and new (1999) vessels should continue to be surveyed under the standard agreed at the time of build which is recorded in the vessel's CM files / SharePoint vessel file and approved stability book; ensuring that the maximum approved operating draughts forward are not exceeded.
- 3.4.15 The UK has a number of mussel dredger type vessels on the flag, these usually operate on restricted, near-coastal voyages, in fair weather. The vessels are generally not fitted with hatch covers and cannot comply with minimum bow height requirement. These cases should be discussed with the relevant Consultant FV surveyor and Stability and Plan Approval Unit to determine an appropriate freeboard standard to apply.

ANNEX A - ANNEX TO FREEBOARD

Guidance on the assessment of adequate freeboard

1. [MGNs 503](#) sets out 2 different ways in which the stability of an under 15m fishing vessel can be assessed:
 - a) heel test,
 - b) roll tests,
2. [MGN 526](#) describes how the Wolfson Guidance can be applied to fishing vessels
3. For a vessel lacking full stability information [i.e. method a) is not available] all the other approximate methods [except b) which is purely a measure of upright stability] include minimum freeboard as a key safety parameter. As an indication of what level of freeboard could be considered as “dangerously unsafe” it is instructive to apply methods 1a) and 2 to an 11.9m fishing vessel ALPHA (not its real name), which was lost in 2004 with one life. This vessel had a reported freeboard of approx 150mm, which was identified as a contributory factor in her loss. She is believed to have been lost in freshening wind conditions of force 5-6 (corresponding to significant waveheights, Hs of about 1.3m to 2m).
4. **Using guidance 1a)** the minimum freeboard should be 560mm. In this case ALPHA has only 27% of that required.
5. **Using guidance 2 above**, which equates freeboard with sea state, gives a “Red” condition (unsafe, and danger of capsizing) for a minimum freeboard of 215mm (the corresponding critical Hs = 0.7m). This is improved to an “Amber” condition (low level of safety) if the minimum freeboard is increased to 431mm (the corresponding critical Hs = 1.4m). So ALPHA had only 35% of the required minimum freeboard for force 5-6 winds and is clearly in the “Red” condition with insufficient freeboard for even Hs = 0.7m (probably Hs \geq 1.4m when she was lost).
6. These measures give reasonably consistent results and can be helpful where surveyors have a concern about freeboard.
7. Another difficulty in dealing with vessels of this size is whether or not a particular vessel should be treated as an “open boat” rather than a “decked vessel”. Simply because a vessel is presented with a continuous weathertight deck and freeing ports it should not be assumed that this arrangement is appropriate for that vessel; check that the freeboard to the weathertight deck is adequate. There have been cases where operators have cut freeing ports to drain weathertight decks when the original designs did not have them because of the vessels’ low freeboards. The new freeing ports, rather than draining water off the decks actually encouraged water onto the decks creating a flooding hazard which has sunk vessels. [MSIS27 Chapter 1 Annex 3](#) defines an Open boat as:

“Open Vessel”; means a vessel which is not a decked vessel and open vessels should have a positive clear height at side.

“Positive Clear Height at Side”; for open vessels means:-

The distance between the waterline (in an upright and fully loaded condition) and the lowest point on the gunwale is not less than 400mm for a vessel of 7m in length or under and not less than 690mm for a vessel of 14.99m in length. For a vessel of intermediate length the clear height at side should be determined by linear interpolation. The clear height at side should be measured to the top of the gunwale or capping or to the top of the wash strake if one is fitted above the capping.

A vessel fitted with an internal moulding or sole boards where the space below the sole is not permanently protected from water ingress (except for watertight hatches which are to be kept closed at sea) and does not provide a space to be used for either accommodation, shelter of persons, stowage, or permanent reserve buoyancy should be treated as an open vessel.

8. Open boats usually have greater freeboards than decked vessel. This is shown by referring again to the fishing vessel ALPHA but this time treating it as an “undecked vessel”. Using the Wolfson guidance we get the following results:

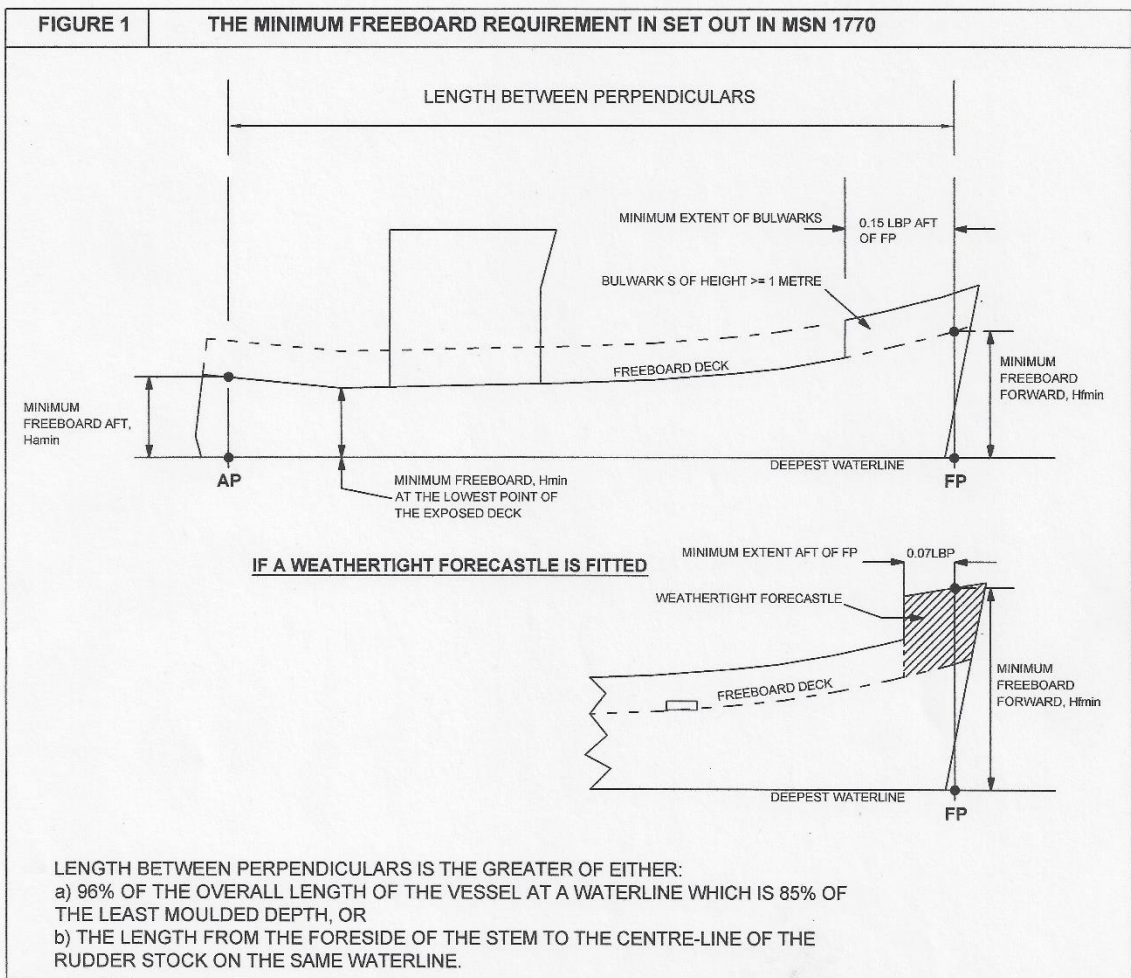
- **for the “Red” condition**, $H_s = 0.7\text{m}$ – minimum freeboard to the top of the gunwale = 560mm; and
- **for the “Amber” condition**, $H_s = 1.4\text{m}$ - minimum freeboard to the top of the gunwale = 840mm.

9. It can be seen that for a similar level of safety the freeboard to the gunwale top on an “undecked” vessel has to be substantially greater than the freeboard to the weathertight deck on a “decked” vessel; but it is possibly more easily achieved if the vessel is fitted with bulwarks to protect the crew from falling overboard.

It is worth noting that SFIA’s Less than 15m LOA Construction Standards would require minimum freeboards for ALPHA of:

- a) as a decked vessel - 300mm;
- b) as an open boat – 584mm.

10. Minimum freeboard requirements in [MSN 1872](#)

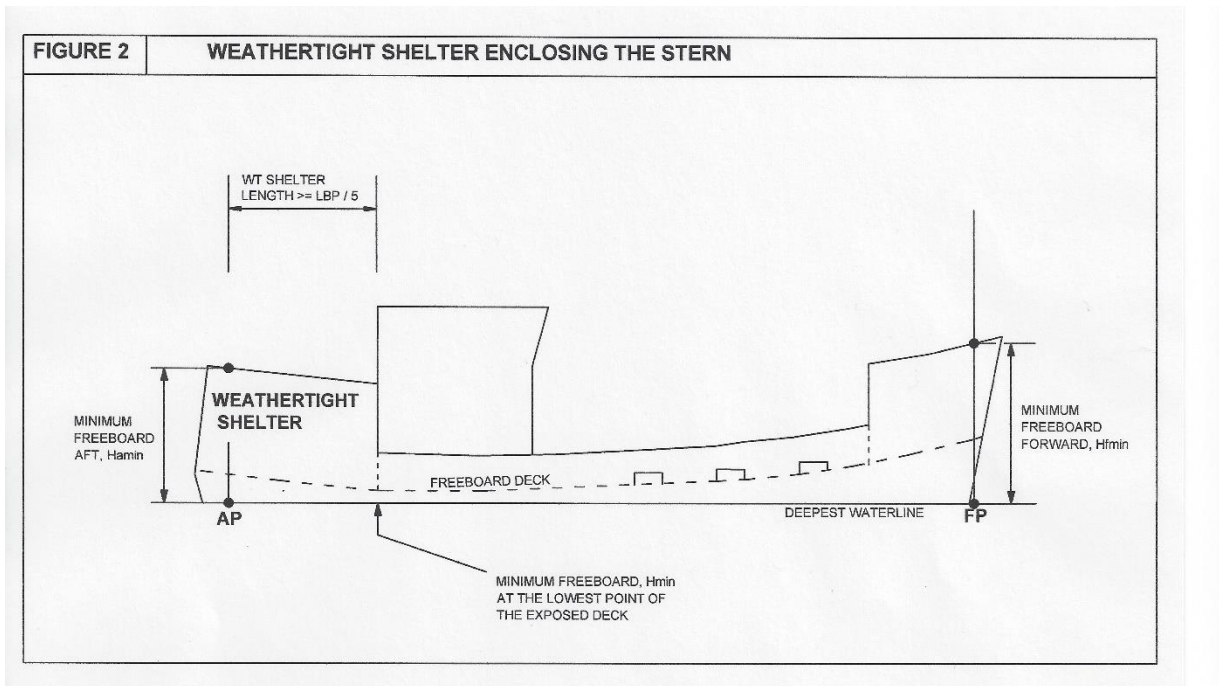


11. Comparison of freeboards between [MSN 1872](#) and [MSN 975](#)

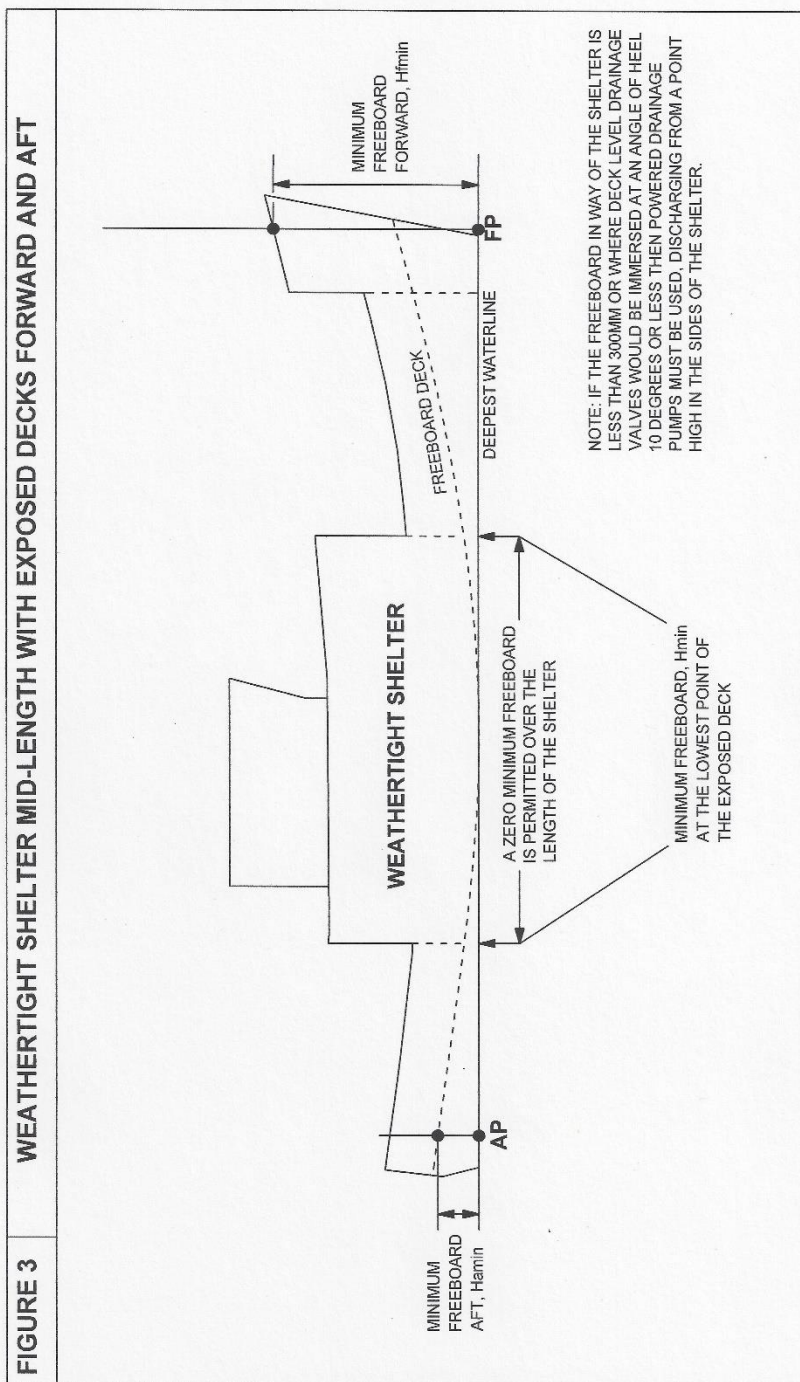
- a. The following table compares the forward and after freeboards computed using [MSN 975](#) and [MSN 1872](#) for a range of ship lengths. It can be seen that the allowances introduced by SM55 are implicit in the freeboards calculable under [MSN 1872](#) i.e. no deductions should be applied to freeboards calculated using [MSN 1872](#). It should also be noted that [MSN 1872](#), unlike [MSN 975](#), requires a minimum freeboard of at least 300mm anywhere along the length of the vessel.

Length	Freeboard forward, mm			Freeboard aft, mm		
	MSN	MSN	MSN 975	MSN	MSN	MSN 975
Perpendicular						
15	1163	1240	1178	640	800	640
16	1190	1270	1207	667	830	664
17	1218	1300	1235	693	870	696
18	1245	1330	1264	720	900	720
19	1273	1350	1283	747	930	744
20	1300	1380	1311	773	970	776
21	1328	1410	1340	800	1000	800
22	1355	1440	1368	827	1030	824
23	1383	1470	1397	853	1070	856
24	1410	1500	1425	880	1100	880

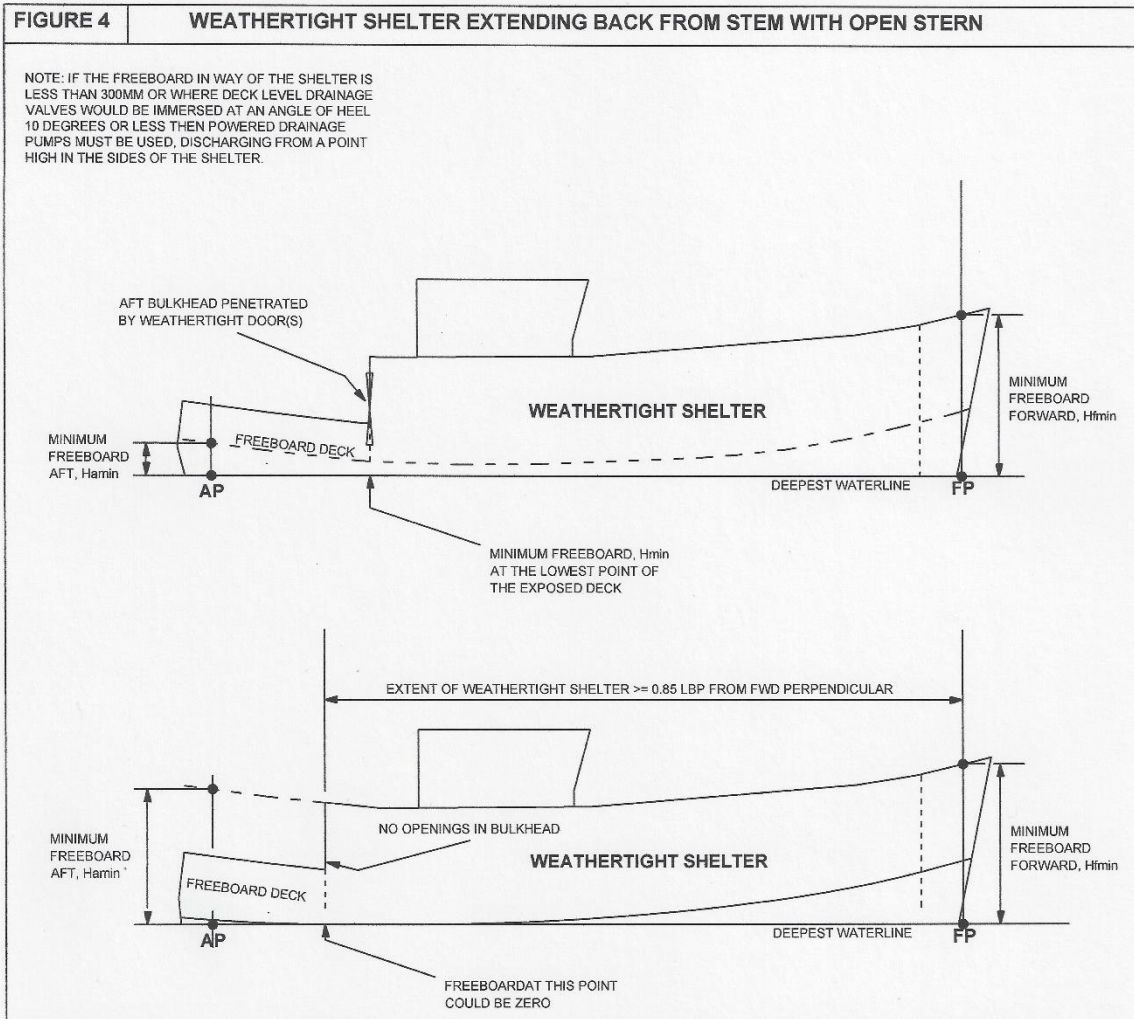
12. Minimum freeboards aft with a weathertight poop



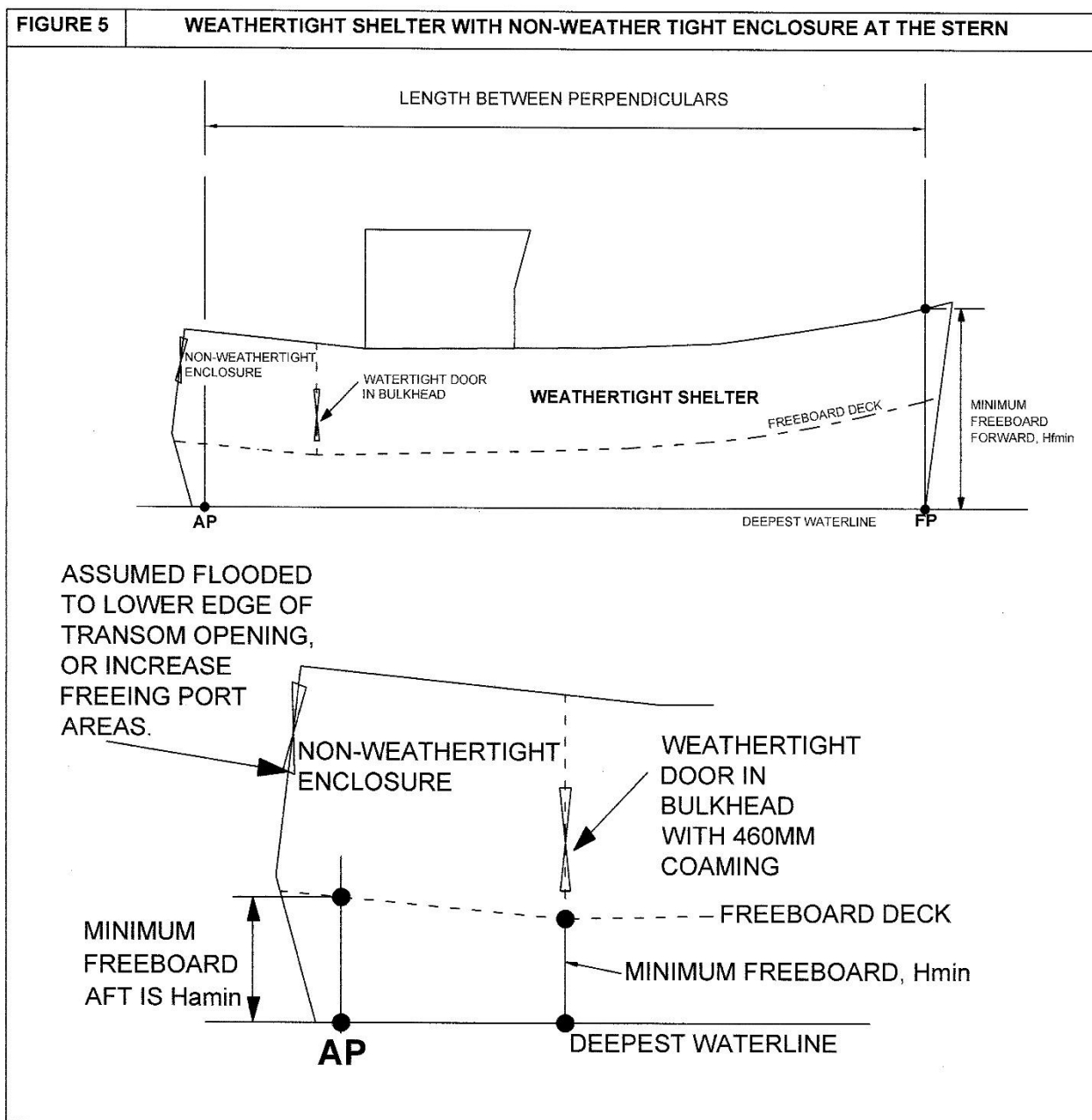
13. Minimum freeboards with mid-length weathertight shelter



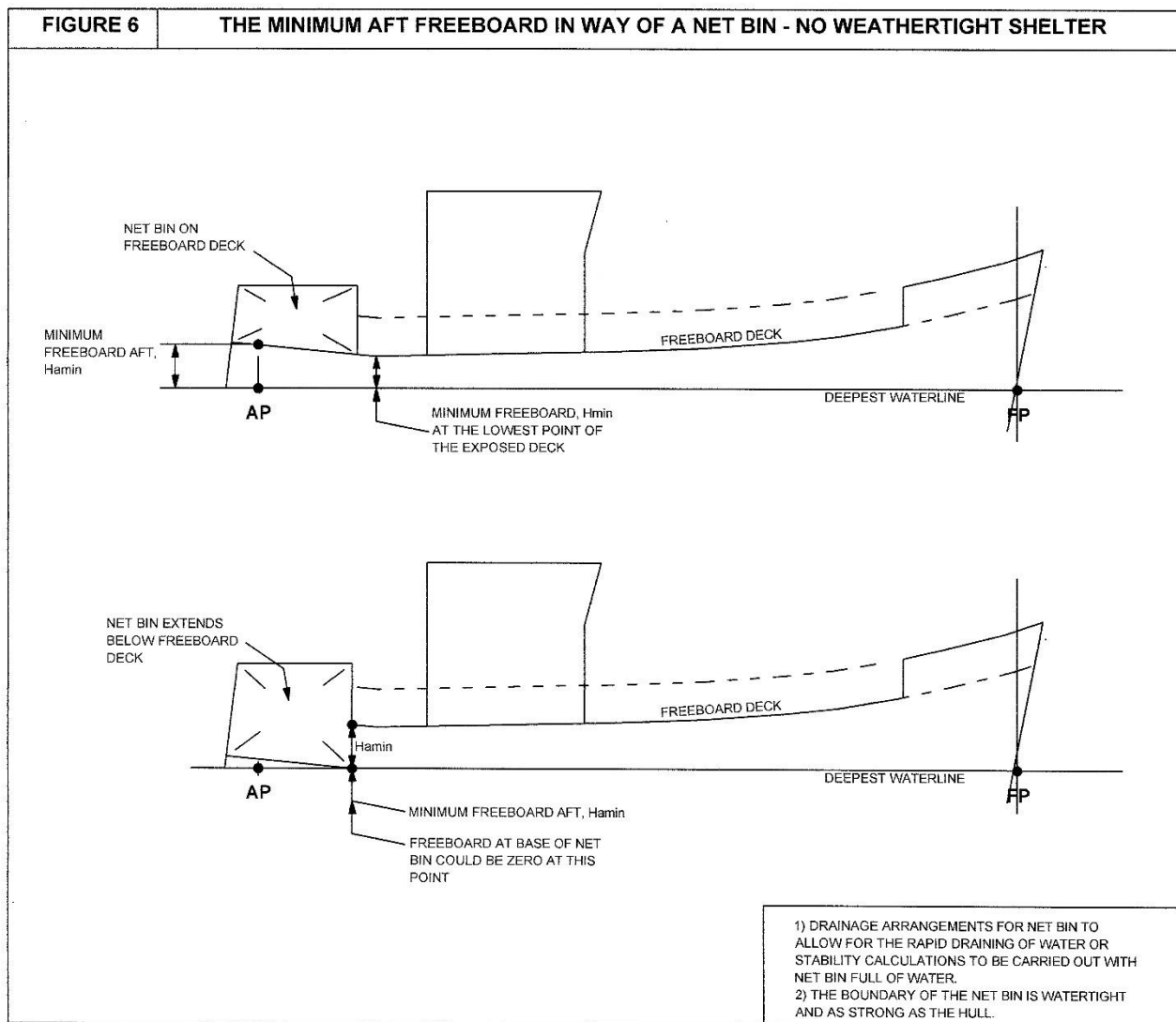
14. Minimum freeboard requirements with long forward shelter



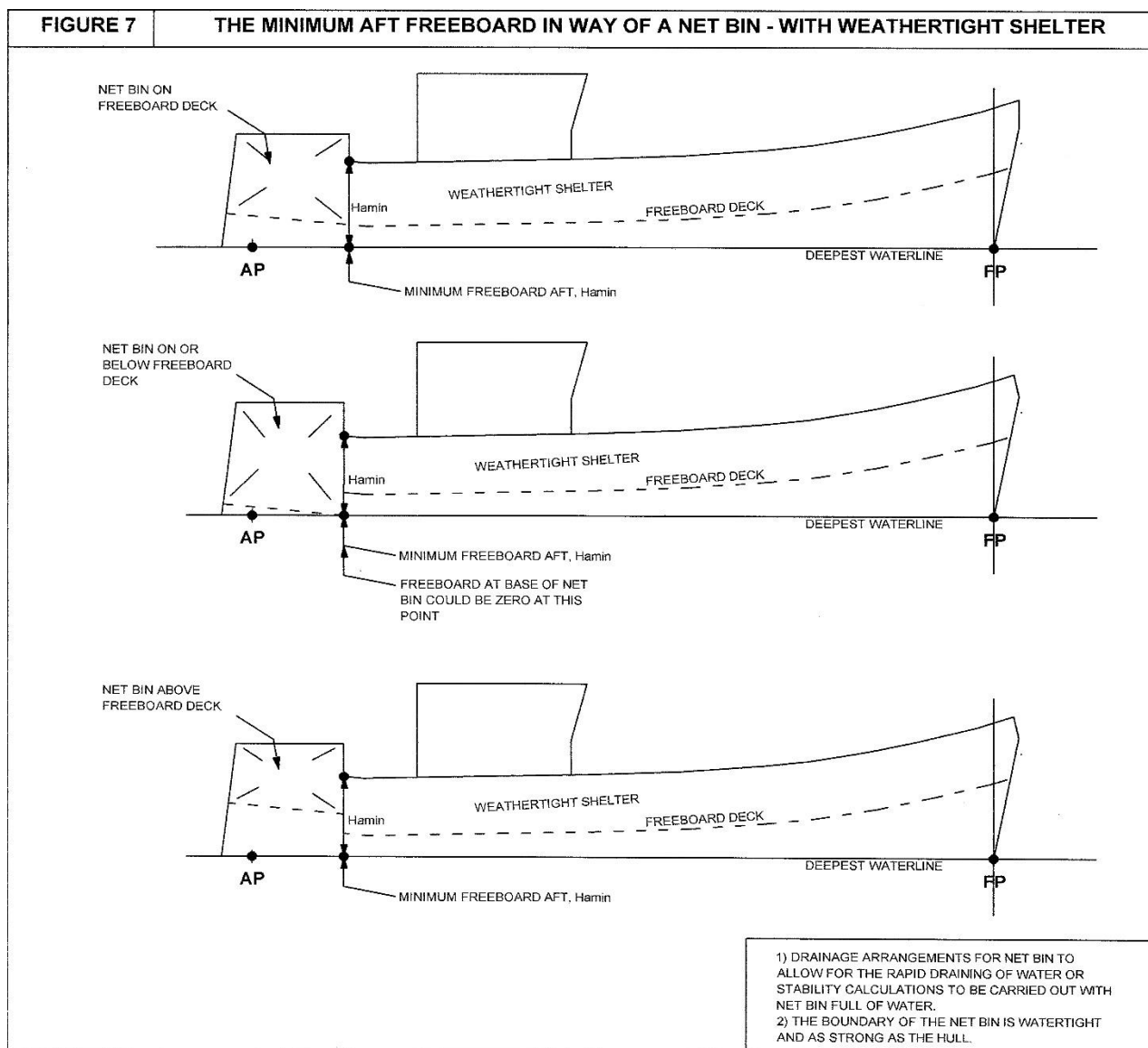
15. Minm freeboard requirements with enclosed non-weathertight stern



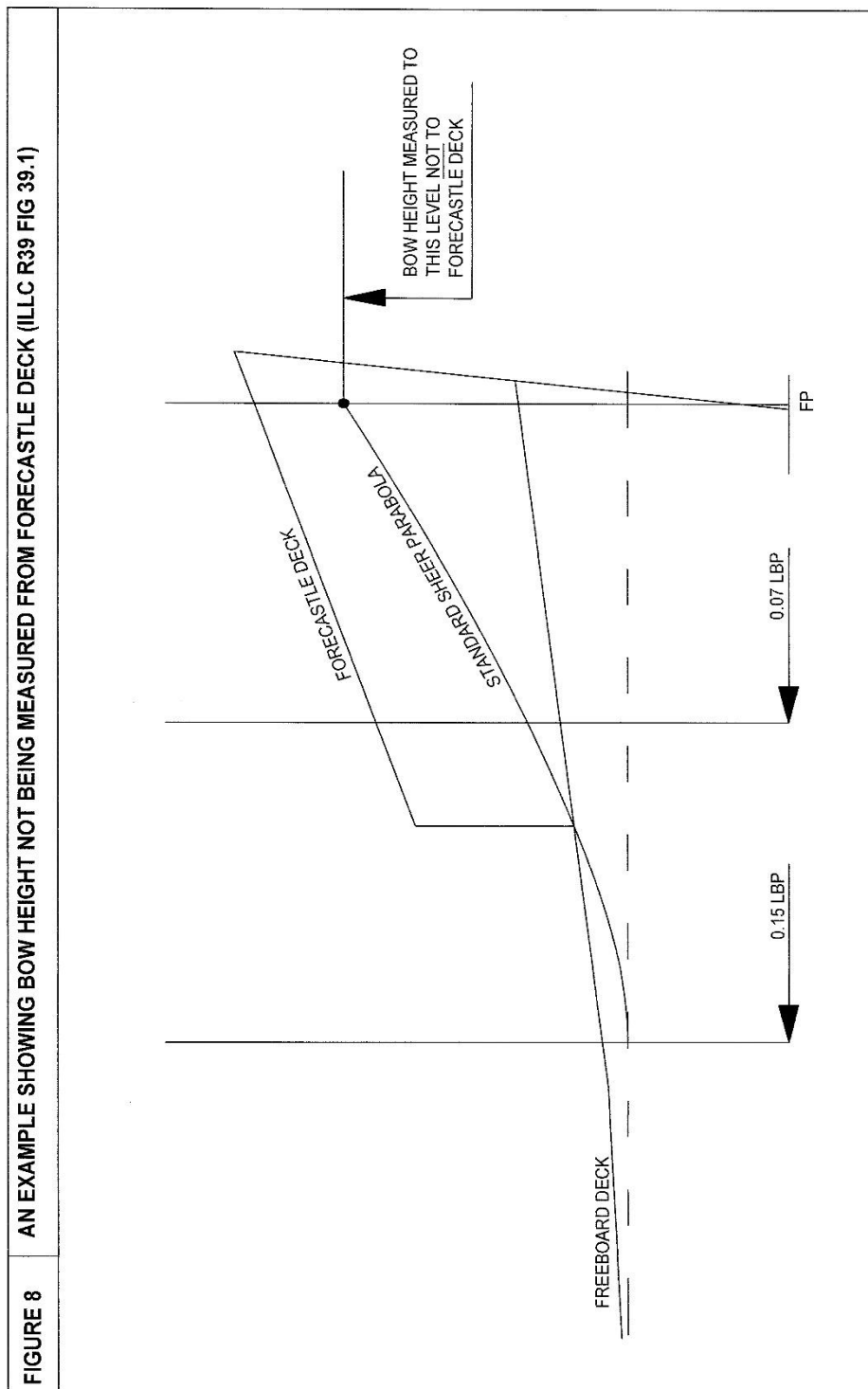
16. Minm freeboard aft in way of net bin – no weathertight shelter



17. Minm freeboard aft in way of net bin – with weathertight shelter



18. An example of bow height not measured from forecastle deck



DOCUMENT AMENDMENT HISTORY

Version Number	Status / Change	Date	Author Reviewer	Content Approver	Next Review Date/Expiry Date
09.21	<ul style="list-style-type: none"> Updated Code to reflect new requirements of MSN1871 Amendment No.2 	31/08/21	D Fenner	G Stone	01/09/2023
11.21	<ul style="list-style-type: none"> Clarify MCA witness tests at inspection Form and content check of approved stability books Sets out requirements for new and existing Razor fishing multihulls 	09/11/21	D Fenner	G Stone	31/10/2023
01.22	<ul style="list-style-type: none"> Clarify an Offset load test can be conducted after a Roll/Heel Test failure. Clarify that where vessel is a Category A vessel, the first step after failing a test is inclining. 	31/01/22	D Fenner	G Stone	31/01/2023
05.22	<ul style="list-style-type: none"> Cat A vessels should be referred to the Technical Panel if they fail Roll Test to decide whether to undergo Offset Load Test or go straight to inclining 	27/04/22	D Fenner	G Stone	31/05/2023
07.22	<ul style="list-style-type: none"> Split Chapter 3 into new sections on Under 15m Vessels, 15m and over vessels and Freeboard, make direct reference to MGN503 for assessing stability of vessels of less than 15m and reference to MSIS27 Chapter 2 for deciding equivalencies for Freeboard 	01/07/22	D Fenner	G Stone	01/07/24
11.22	<ul style="list-style-type: none"> Vessels which meet the freeboard/positive clear height at side, waterfreeing requirements and stability requirements of MSN1871 	28/11/22	D Fenner	G Stone	28/11/24
12/22	<ul style="list-style-type: none"> Surveyors should refer to Sections 1.23 and 1.24 of MSIS27 Chapter 1 when 	12/22	D Fenner	G Stone	28/11/24

	reviewing modifications to vessels.				
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