



BSS ECPs for HBR (Part 10)

- The Appendices -

Interim version – 1 January 2023

This training/interim version of the BSS Hire Boat Requirements is being used by Examiners when conducting Examinations on hire boats until the controlled copy is released.

The Requirements remain unchanged from the ratified version of 1 January 2019. But it should be noted that there is a new Appendix supporting Check 10.1.2 (handhold Requirements).

The two Appendices supporting the slip-resistance and hull opening Requirements remain unchanged from those previously published, other than their references have been changed from 'N' to '10a' and 'O' to '10c', respectively.

The BSS Technical Committee will be undertaking an interim review of the BSS Hire Boat Requirements in the Autumn of 2023 and their recommendations will go to BSSAC. Therefore, all users of these documents are encouraged to communicate any typographical errors or omissions, or other comments, regarding the Hire Boat Requirement Checks and the supporting Appendices to the BSS Business and Technical Manager, Graham Forbes (Graham.Forbes@canalrivertrust.org.uk)



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This Appendix provides supporting information concerning the BSS Hire Boat Requirement for all designated external Crew Areas, companionway steps, and boarding planks to be provided with suitable slip-resistant surfaces.

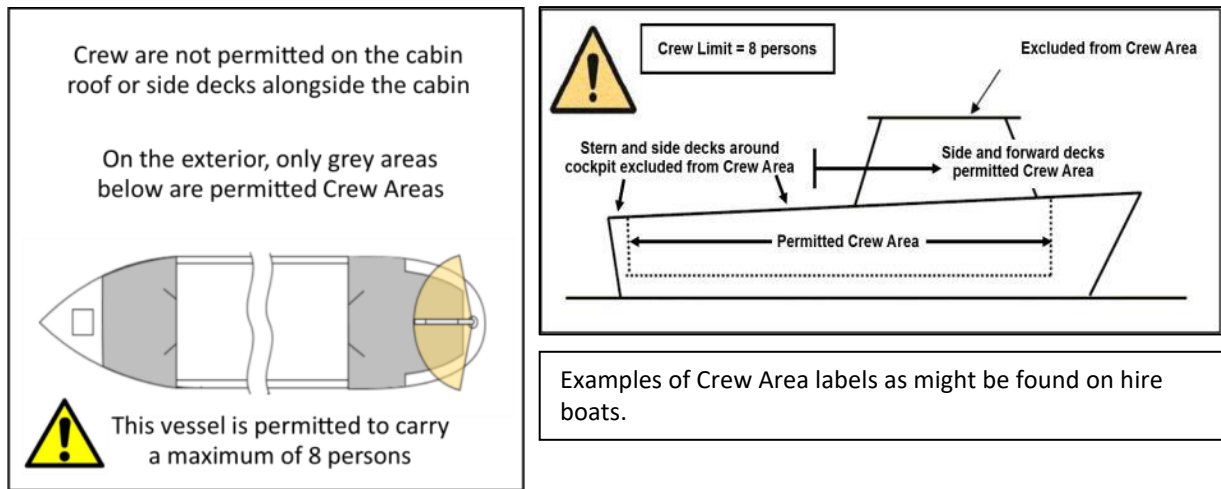
10a [1] OBJECTIVE OF THE BSS REQUIREMENT AT CHECK 10.1.1

The objective at Check 10.1.1 is to ensure that events concerning hirers slipping and falling (particularly falling overboard and in other key areas), are kept as low as reasonably practicable by requiring areas on the exterior of the boat where hirers are permitted to walk and/or stand, boarding planks and companionway steps to be provided with suitable slip-resistant surfaces.

10a [2] DESIGNATION OF CREW AREAS

It is a hire operator’s responsibility to designate Crew Areas; Examiners must not second-guess a hire operator’s intention as to the designation of Crew Areas.

For each boat Examiners must identify the extent of the designated external Crew Areas from the hire operator. On boats where a Crew Area label (as the examples, below) is permanently affixed at a helm position Examiners may take the label as proof of the designated Crew Areas. However, where such labels are not provided, or they are incomplete, Examiners must seek direct instruction from the hire operator as to the designated Crew Areas for each boat.



10a [3] SUITABLE SLIP-RESISTANT SURFACES

Suitable slip-resistant surfaces are those **intentionally** prepared, machined, covered, moulded, etc. to provide increased adherence between the foot (or shoe) and the surface of the deck. During 2016 the BSS carried out an extensive review of the deck surfaces found on hire boats and measured the slip-resistance of different surfaces using a SlipAlert® slip-resistance tester. To follow are examples of materials and surfaces identified as being suitably slip resistant, and others found not to be suitably slip-resistant.

a. Materials and surfaces identified as potentially being suitably slip-resistant:

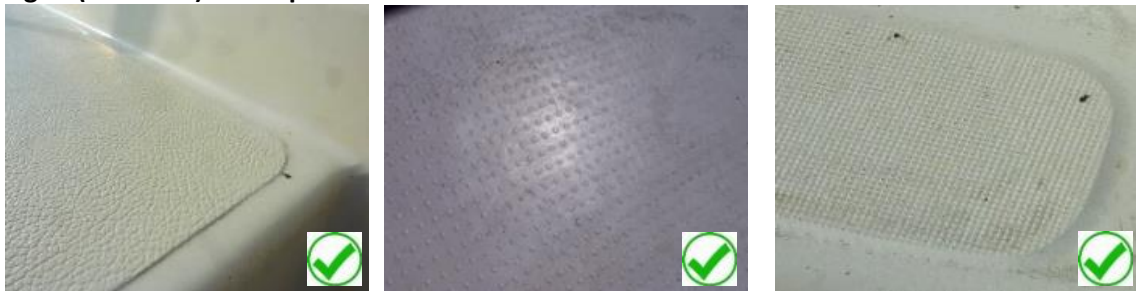
i. Man-made boards with phenolic coatings (e.g. WISA, BUFFALO etc)



ii. Polymer-bonded embossed / plain sheeting (e.g. TREADMASTER)



iii. Integral (moulded) FRP slip resistant surfaces



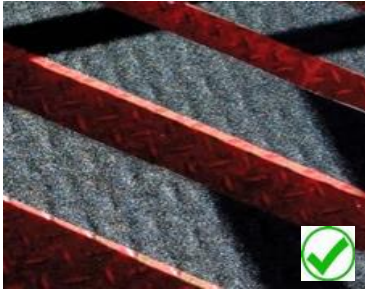
iv. Slip-resistant paint coatings



v. Adhesive tapes (bonded natural aggregate / synthetic bead)



vi. Over-coated/painted embossed metal plate



Embossed metal plate may only be considered as being suitably slip-resistant if it has been covered/painted with a suitable slip-resistant coating. This is because the manufacturers contacted during the BSS review were unable to provide appropriate assurances that their products have inherent slip-resistance, and because on testing with the SlipAlert® the results were inconclusive.

vii. Embossed rubber plate



Unlike plain embossed metal plate, proprietary embossed rubber plates can be considered as having an intended slip-resistant surface. As shown below, such plating is mostly available for step treads.

viii. Unpainted timber (e.g. teak decks)



b. Deck surface types identified as not being suitably slip-resistant :

ix. Metal plate (including embossed metal plating and plain sheeting)



x. Normal coach-type paints and varnish

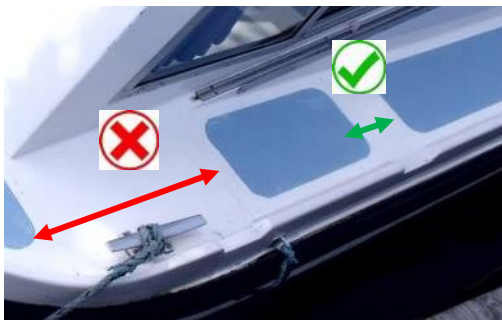


When selecting slip-resistant surfaces hire operators are recommended to choose on the basis of their slip-resistant performance as supported by the manufacturer or supplier, and by their longevity.

10a [4] GAPS IN OTHERWISE SUITABLE SLIP-RESISTANT SURFACES

To keep the chances of hirers slipping as low as reasonably practicable it is important that gaps in otherwise suitably slip-resistant surfaces are kept to a minimum. Except on glazed areas any gap must not be greater than 75mm. On glazed areas, such as deck hatches, gaps may be up to 500mm. Both of these distances derive from the international standard *BS EN ISO 15085 Small craft - Man-overboard prevention and recovery*. The 75mm distance is likely to be based on average foot widths. As set out below, the causes of gaps can be separated into three main categories.

a. Break in the continuity of the intended slip-resistant surface



On this cruiser the white-coloured deck areas have no suitable slip-resistant surface, but the blue areas do. The gap between the blue slip-resistant surfaces adjacent to the deck cleat is greater than 75mm and therefore not compliant. In this example the deck adjacent to the cleat will need to have a slip-resistant coating or material applied. The gap further forward along the side deck is smaller than 75mm and is therefore acceptable.



The 500mm gap allowance on glazed areas is to allow standard 500mm x 500mm (or smaller) deck hatches to be excluded. It is also possible that some hire operators will specifically exclude deck hatches from the designated Crew Area (such as by labelling the hatch 'NO STEP' or by the area of the hatch being excluded on the Crew Area label).

The 500mm distance is transversely and longitudinally, not diagonally.



Slip-resistant surfaces do not need to extend to the outer edges of individual areas, but the gap to the outer edge must not exceed 75mm. Following risk assessment some hire operators may elect to enhance the slip-resistance of outer and rounded edges, perhaps by the application of adhesive tape.

b. Degradation of the intended slip-resistant surface through wear or other physical damage

A surface must be considered as no longer slip-resistant where the original slip-resistant finish as intended by the manufacturer or applicator is no longer present. For example, if the slip-resistant surface wears off a Buffalo board exposing the underlying plywood, the plywood cannot be considered as a slip-resistant surface. Also, if slip-resistant paint wears off a mild steel deck, the exposed mild steel plate cannot be considered as being slip-resistant as it is not the intended slip-resistant surface of the deck. There must be no gaps of more than 75mm in the original intended slip-resistant surface.



Gaps in the intended slip-resistant paint coatings caused by wear are greater than 75mm and as such this deck area is not compliant.



Gap in the intended Hexa Grip board slip-resistant surface caused by wear is greater than 75mm and as such this deck area is not compliant.



The original, intended slip-resistant paint coating on this narrowboat bow side deck has been degraded by the application of too much gloss paint over the original surface.



Gaps in the intended slip-resistant paint coatings caused by wear are greater than 75mm and as such this deck area is not compliant.



Although the slip-resistant paint coating has worn the areas of wear are less than 75mm across and as such this deck area is compliant.



Although the slip-resistant paint coating has worn the areas of wear are less than 75mm across and as such this deck area is compliant.

c. Contamination of the intended slip-resistant surface

Examples of contamination include fuel, oil, grease, anti-freeze solution, sewage, toilet tank additives etc and organic growth. Contamination of slip-resistant surfaces can significantly degrade their effectiveness.



Oil contamination on Hexa Grip board over a length greater than 75mm.



Algae/organic contamination on a GRP moulded deck surface.



Algae/organic contamination on a teak deck.

Hire operators are recommended to take the opportunity prior to each hire period to inspect and if necessary remove any contaminants from slip-resistant surfaces. Hire operators are also recommended to introduce a calendar-based schedule of deeper cleaning (as recommended by the slip-resistant material / coating manufacturers), to avoid any 'layering' of contaminants.

10a [5] COMPANIONWAY STEPS

Companionway steps are required to have suitable slip-resistant surfaces due to such areas often getting wet, either directly from rain and/or from foot-fall, and due to the risk of significant injury in the event a slip and fall does take place.

Suitable slip-resistant surfaces on companionway steps need not be continuous, but there must be no gaps greater than 75 mm on the leading edge of each step.

The leading edge is taken to extend from the front edge half-way towards the back edge of each step. Therefore, for the step shown in the photograph above to be compliant, the gap 'A' below must be less than 75mm. If it's not, additional slip-resistant material will need to be fitted as the varnished timber cannot be considered to be suitably slip-resistant.



10a [6] SLIP-RESISTANT SURFACES PROVIDED BY LOOSE COVERINGS

Any loose coverings in place to provide a suitable slip-resistant surface, such as rubber mats or gratings must not be capable of unintended movement. Such coverings must be held in place by fixings or by the layout of adjacent boat structures.

10a [7] DOOR MATS

Door mats located adjacent to entry/exit points are not covered by the BSS Requirements. However, where relevant, the deck beneath such mats must have a suitable slip-resistant surface.



This Appendix provides supporting information concerning the BSS Hire Boat Requirement for designated external Crew Area decks to be provided with suitable handholds in good condition.

10b [1] OBJECTIVE OF THE BSS REQUIREMENT AT CHECK 10.1.2

The objective of Check 10.1.2 is to ensure that events concerning hirers falling overboard are kept as low as reasonably practicable by requiring deck areas around the exterior of a boat, where hirers are permitted to walk and/or stand, and from where a slip or other fall could lead to a hirer falling directly overboard, to be provided with suitable handholds in good condition.

10b [2] GENERAL

Fundamentally, on all parts of the exterior of a boat, where hirers are permitted to walk and/or stand, and from where a slip or other fall could lead to a hirer falling directly overboard, hirers must always be able to reach a handhold wherever they are standing. To ensure that hirers do not have to let go of one handhold in order to be able to reach another, the minimum gap between handholds must be less than, or equal to, 1.5m. Also, to ensure handholds close to the outer edge of a deck do not act to topple hirers overboard they must be a sensible height above the deck.

10b [3] HANDHOLDS ON BOW AND OTHER EXPOSED DECKS

On all hire boats where the hire operator permits hirers to walk or stand on the bow (or other exposed) deck during normal operation of the boat hirers must be protected by the provision of suitable handholds in good condition.

Hire operators are recommended to use pulpits or other types of guard-rails to provide suitable handhold protection on bow (or other exposed) decks. However, in cases where pulpits/guard-rails are not installed, or their use is not practical or otherwise appropriate, Examiners must ensure that protection is provided by way of other types of suitable handholds.



Fig 1 – two different types of pulpit, both of which provide suitable protection to the otherwise exposed bow deck and would therefore be BSS compliant with Check 10.1.2. Hire operators are encouraged to install pulpits wherever practical.

The following three Figures are examples of non-compliant bow (or other exposed) decks because suitable handholds are not within reach from all parts of the Crew Area deck.



Fig 2 – bow deck on cruiser is not compliant with Check 10.1.2 as there is no handhold available. Even if the hirer were to crouch down there would be no suitable handholds on the forward deck.

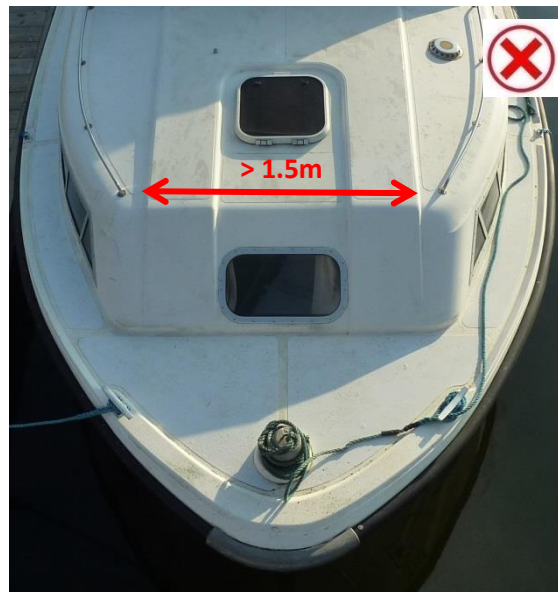


Fig 3 – bow deck is not compliant with Check 10.1.2 as the gap between the two cabin roof handholds is greater than 1.5m, and there are no alternative handholds on the forward deck within 1.5m of the cabin roof handholds. The rope cleats cannot be considered as suitable handholds as they are at low level and at the deck edge (see section 10b [4]).

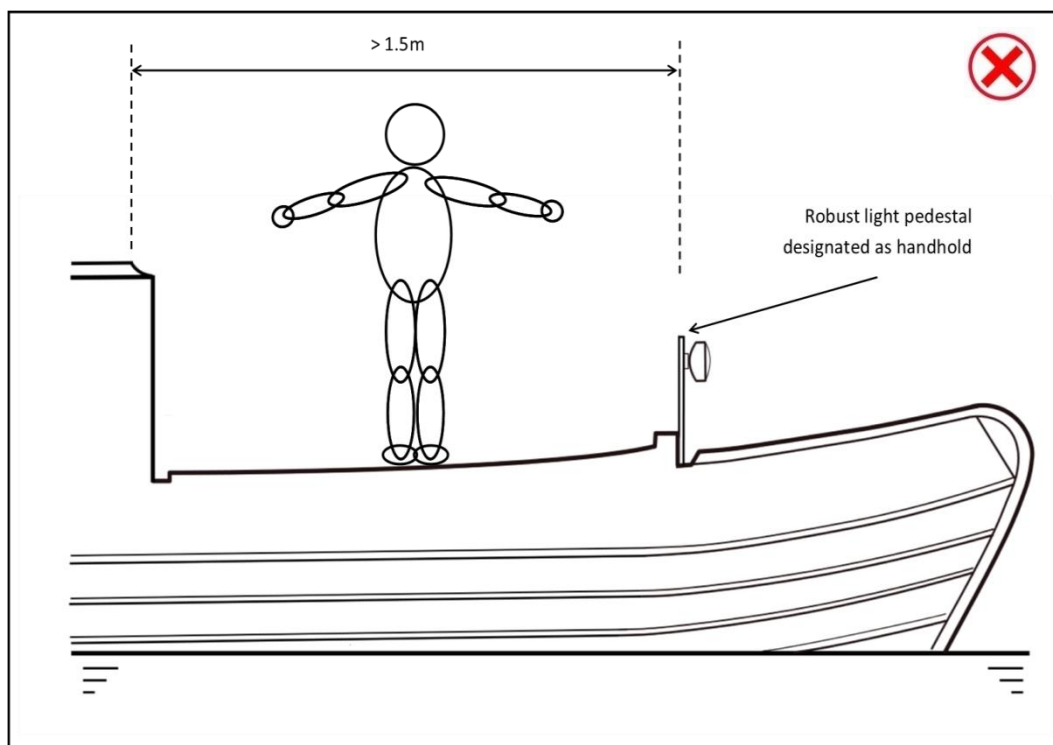


Fig 4 – tug-style deck on narrowboat is not compliant with Check 10.1.2 as the gap between the cabin roof handhold and the light pedestal is greater than 1.5m.

The following four Figures are examples of compliant bow (or other exposed) decks because suitable handholds are within reach from all parts of the Crew Area deck.

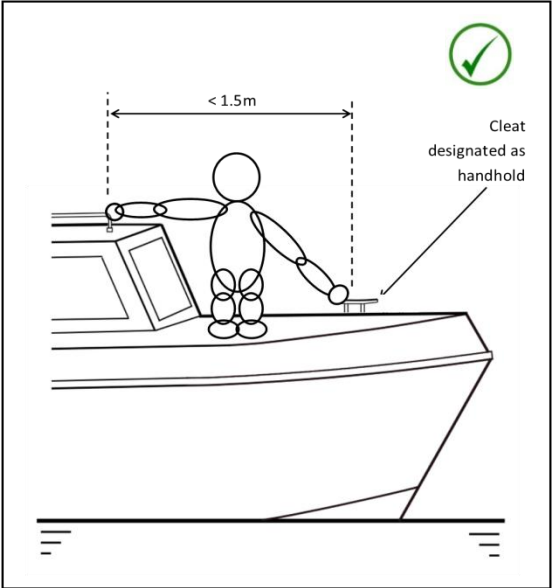


Fig 5 – the bow deck is compliant with Check 10.1.2 because the hirer can reach a centreline cleat while still reaching a cabin roof handrail. It is permissible for designated handholds to be at low level provided they are not within 300mm of the deck edge (see section 10b [4]).



Fig 6 – The hire operator of this cruiser (as seen previously at Fig 3) has chosen to add a handhold to the cabin structure above the forward window. This arrangement is now compliant at Check 10.1.2 as the hirer can reach a suitable handhold from anywhere on the forward deck and the gap between the handholds is less than 1.5m.

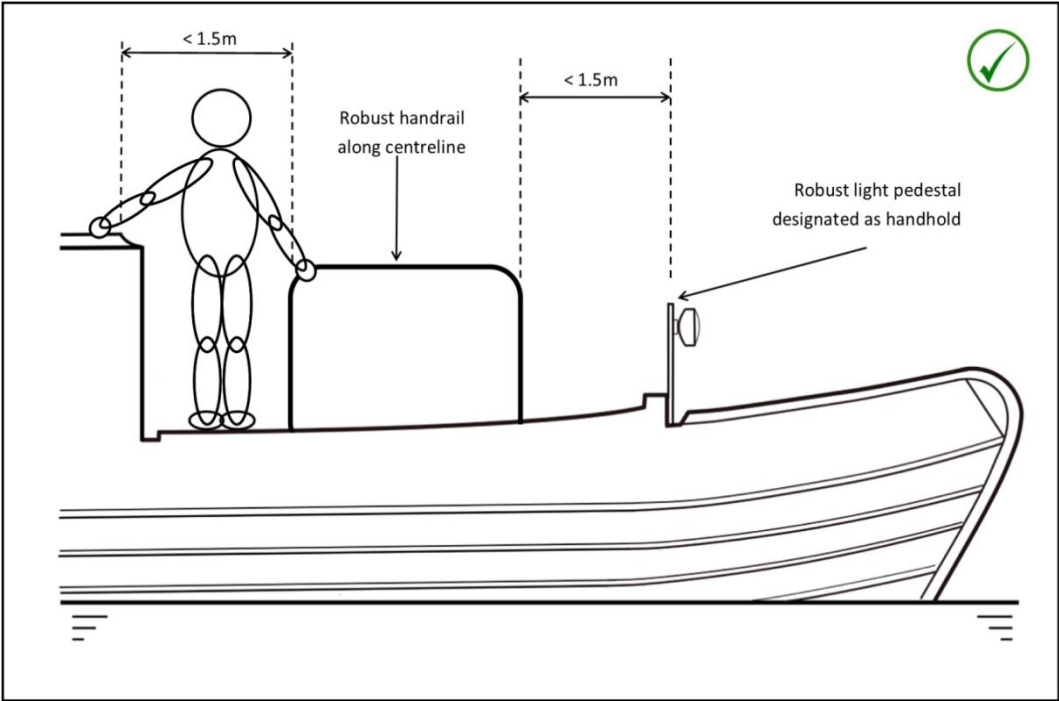


Fig 7 – tug-style deck on narrowboat fitted with handrail along longitudinal centreline is compliant with Check 10.1.2 as the gaps between the cabin roof handhold and the handrail, and the handrail and the light pedestal, are less than 1.5m.

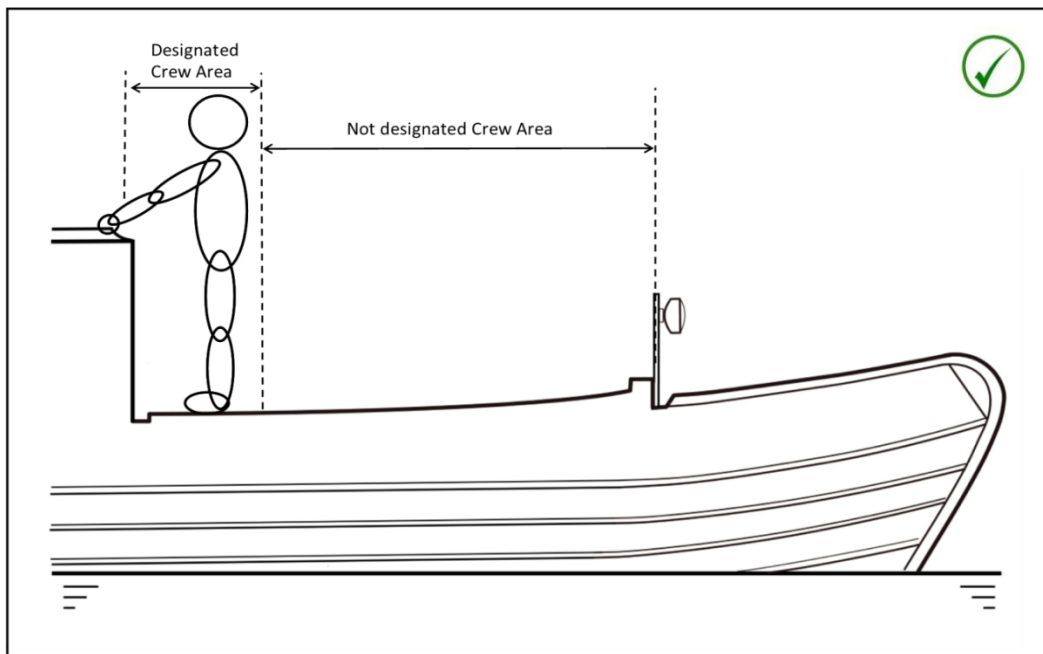


Fig 8 – the hire operator has chosen to limit the designated Crew Area on the narrowboat’s tug-style forward deck to the area immediately forward of the cabin, within which hirers can reach the handrails on the cabin roof. This arrangement is compliant with Check 10.1.2, although in such circumstances it may be necessary for the bow rope to be brought back to the cabin.

The previous examples of compliant bow and forward deck arrangements are not intended to be definitive, but rather to put across general concepts of how hire operators may choose different means to ensure hirers can move about exposed decks safely.

10b [4] HEIGHTS OF HANDHOLDS ABOVE DECK LEVEL

If handholds are at, or close to, deck level around the deck edge hirers using such handholds could topple/pivot over the handhold rather than it preventing them from falling overboard. As such, handholds inboard of the tread area but within 300mm of the deck edge must be at least 350mm above the level of the deck (See Fig 9a), but handholds greater than 300mm inboard of the deck edge may be at any height (See Fig 9b).

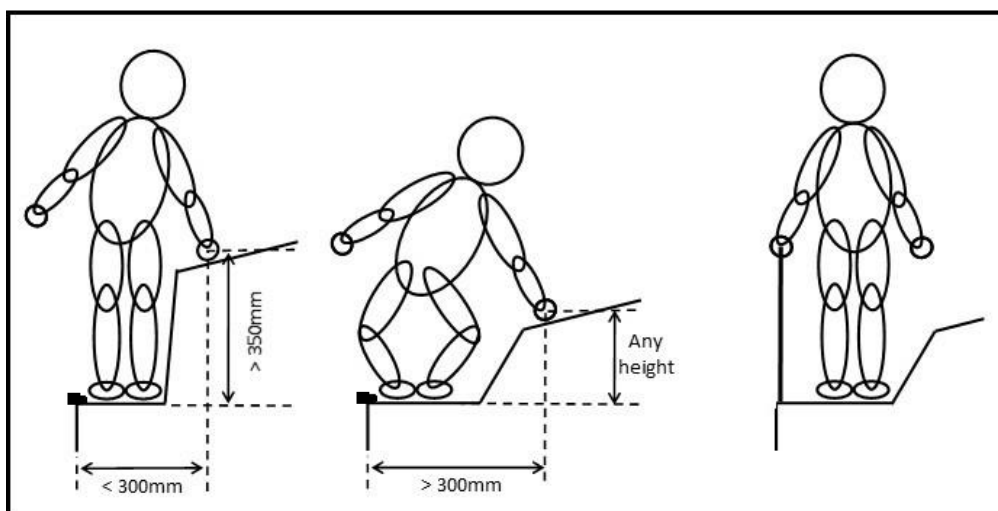
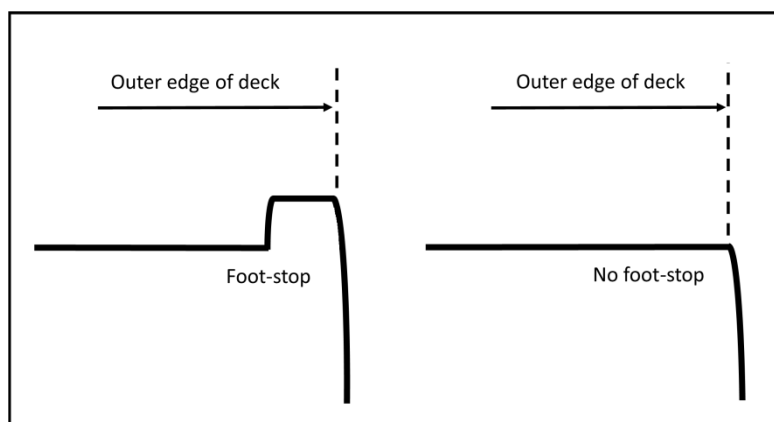


Fig 9a

Fig 9b

Fig 9c

When measuring the horizontal distance between the deck edge and the handhold the distance to be measured is that from the outer edge of the deck which may be used to stand on to the centreline of the handhold. So in cases where a foot-stop is present along a deck edge, provided it can be used to stand on, the point to measure to is the outer edge of the foot-stop.



with foot-stops and no foot stops.

The Requirements at Check 10.1.2 do not specify minimum heights for pulpits, guard-rails or guard-lines around the outer edge of a deck (see Fig 9c), but hire operators are recommended to determine by risk assessment the extent of any such installations and to be guided by the specifications within established boatbuilding standards. The minimum specifications within *ISO 15085 Small craft – man-over board and recovery* are for minimum heights of 450mm or 600mm depending on various installation parameters.

10 [5] HANDHOLDS ACROSS SLIDING CANOPY OPENINGS

On boats where the hire operator designates the side deck alongside a sliding canopy as a Crew Area there must be adequate handhold provision when the canopy is open. There are a number of different ways suitable handholds can be provided, but the three most common are likely to be:

1. With the sliding canopy full open, the gap between the handholds on the fixed boat structure forward of the canopy and the handhold on the canopy is less than or equal to 1.5m.
2. The coaming itself is designated by the hire operator as the handhold. In such cases Examiners must take care to measure the height of the designated handhold above the side deck, and the horizontal distance from the handhold to the outer edge of the deck, and to apply the criteria set out at section 10b [4].
3. Guard-rails or guard-lines are installed around the outer edge of the deck.



Fig 11. In this example the gap between the cabin roof handrails is less than 1.5m, which is compliant. The coaming cannot be considered as a handhold because the side deck is less than 300mm wide and the coaming is less than 350mm above the side deck.



Fig 12. In this example the gap between the cabin roof handrails is greater than 1.5m and is therefore not compliant. However, even though the side deck is less than 300mm wide, the top of the coaming (which the hire operator has designated as a handhold) is greater than 350mm above the side deck, which is compliant.

Hire operators should consider the BSS Requirements for side deck handholds across open sliding canopies as minimum Requirements and are recommended to assess the risks themselves on individual boats. This is because the BSS Requirements primarily address the risk of hirers falling overboard, whereas with sliding canopies there is also a risk of hirers falling inboard and low coamings may exacerbate this risk.

10b [6] BOAT PARTS NOMINATED AS HANDHOLDS BY THE HIRE OPERATOR

Hire operators may nominate parts of a boat as handholds even though being handholds may not be their main function. In such cases it is the hire operator's responsibility to inform Examiners accordingly; Examiners must not second-guess a hire operator's intention to nominate a particular boat part as a handhold. Other than to check their height above deck level, that they are secured against unintended movement, and free of signs of damage and/or deterioration, Examiners are not required to determine the suitability of boat parts nominated as handholds.

10b [7] CANOPIES AND TENTED DECKS

On boats where hirers are permitted to walk and/or stand around the outside of canopies or tents, and from where a slip or other fall could lead to a hirer falling directly overboard, the handhold provision must extend around the canopy or tent. It may be the case that the presence of the canopy or tent does not affect the normal handholds (e.g. where guard-wires or guard-rails are fitted, or where the handholds are shrouds). However, where the erection of the canopy or tent masks the normal handhold provision handholds must either be available on the exterior of the material (e.g. webbing straps), or hirers must be able to grasp handholds through the canopy or tent material (see Fig 13.).



Fig 13 – cabin roof handrail accessible through the tent canvas.

10c [1] DOWNFLOODING

Downflooding – downflooding occurs when river/canal water flows into the interior of a vessel through a hull opening above the normal waterline (which has the potential to sink the vessel).

Downflooding point - for any such hull opening the downflooding point is the actual point/location at which the river/canal water would cease to be held back by the vessel's structures and instead would start to flow unrestricted into the interior of the vessel.

Downflooding height – the vertical height of the downflooding point above the normal laden waterline (n.l.w.l.).

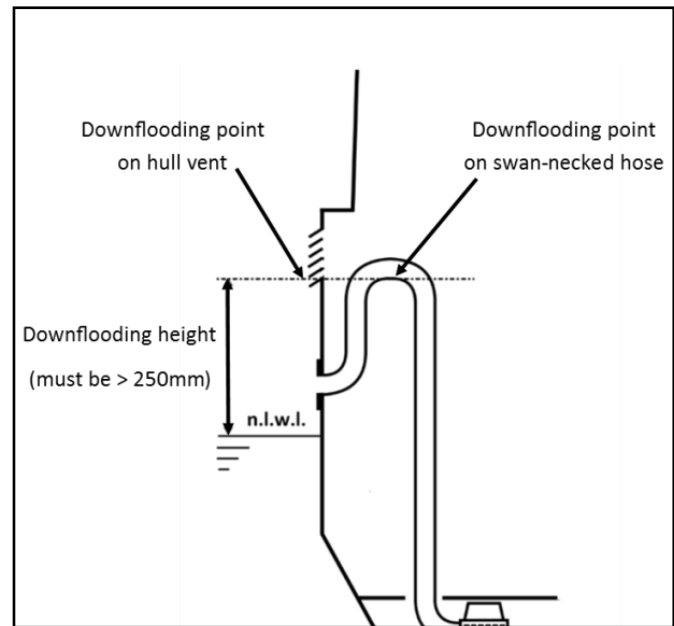


Fig 1 - Downflooding

10c [2] SUMMARY OF CHECKING ACTIONS AND REQUIREMENTS

For hull openings where there is a potential risk of downflooding (where the hull opening is open to the interior of the vessel) the BSS Requirement is that the downflooding height must be at least 250mm.

Examiners must apply a thorough and systematic approach to checking hull openings and establishing whether the associated downflooding heights are compliant:

- a) Start by visually checking all openings in the hull up to the deck and measure their height above the n.l.w.l. All openings greater than 250mm above the n.l.w.l. are compliant and no further checking is required.
- b) For hull openings within 250mm of the n.l.w.l. the next step is to determine whether the opening is connected to a watertight system. If the associated system within the boat is watertight to the interior of the vessel then there is no risk of downflooding occurring. Examples of potentially watertight systems are shown at section **O.4** (below). Where they can be seen or reached, Examiners must check the condition of the skin fitting and internal pipes, hoses, ducts, connections and other associated vessel structures – if such items are found to be in good condition Examiners may consider the hull opening to be watertight and therefore compliant. However, if Examiners find that the integrity of a watertight system has been compromised then this should be reported to the hire operator and recorded on the BSS Database as a non-compliance.
- c) For hull openings within 250mm of the n.l.w.l. not connected to a watertight system the next step is to establish the actual downflooding point and to measure the downflooding height:
 - If the bottom of the hull opening is the downflooding point (e.g. on a hull vent) then it will not be compliant as the downflooding height will be less than 250mm.
 - Where the actual downflooding point is inboard of the hull (e.g. on a swan-necked bilge pump discharge hose), establish the actual downflooding point and measure the downflooding height. If the downflooding height is less than 250mm it's not compliant. If the downflooding height is 250mm, or greater, then the height itself is compliant, but Examiners must check the condition of the skin fitting and internal pipes, hoses, ducts, connections and other associated vessel structures where they can be seen or reached. If Examiners find that the integrity of skin fitting, or internal pipes, hoses, ducts, connections or other associated vessel structures between the skin fitting and the downflooding point have been compromised then this should be reported to the hire operator and recorded on the BSS Database as a non-compliance.

- d) If the downflooding height above the n.l.w.l of a downflooding point within a self-draining cockpit or well deck does not meet the 250mm Requirement then an alternative compliance option is available as explained at section **O.5** (below).

Note – Examiners are only required to check internal pipes, hoses, ducts, connections and other associated vessel structures, whether these are associated with a watertight system or a downflooding point, where they can be seen or reached. In circumstances where a hull opening is found to be within 250mm of the normal laden waterline but the internally connected pipes, hoses, ducts or other associated vessel structures, etc, cannot be seen or reached, and therefore the watertightness or downflooding height cannot be confirmed, Examiners are recommended to bring the presence and location of the hull opening to the hire operator’s attention and to make appropriate notes on their checklist, but the opening cannot be recorded as being non-compliant.

10c [3] MEASURING DOWNFLOODING HEIGHTS

It’s important to always measure downflooding heights accurately.

This is relatively easy to achieve when the downflooding point is the bottom of the hull opening (e.g. on a hull vent), but can be more involved when the downflooding point is inboard of the hull side (e.g. on a swan-necked bilge pump, or the coaming around a cockpit deck hatch). In such circumstances it will often be necessary to extrapolate the downflooding height having measured to an accessible datum point/s.

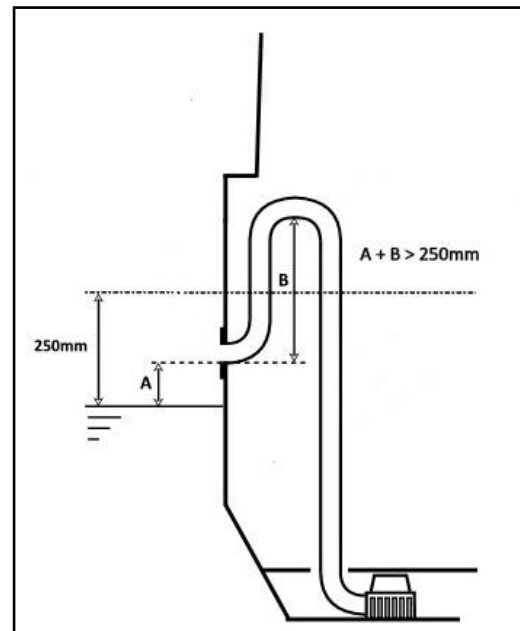


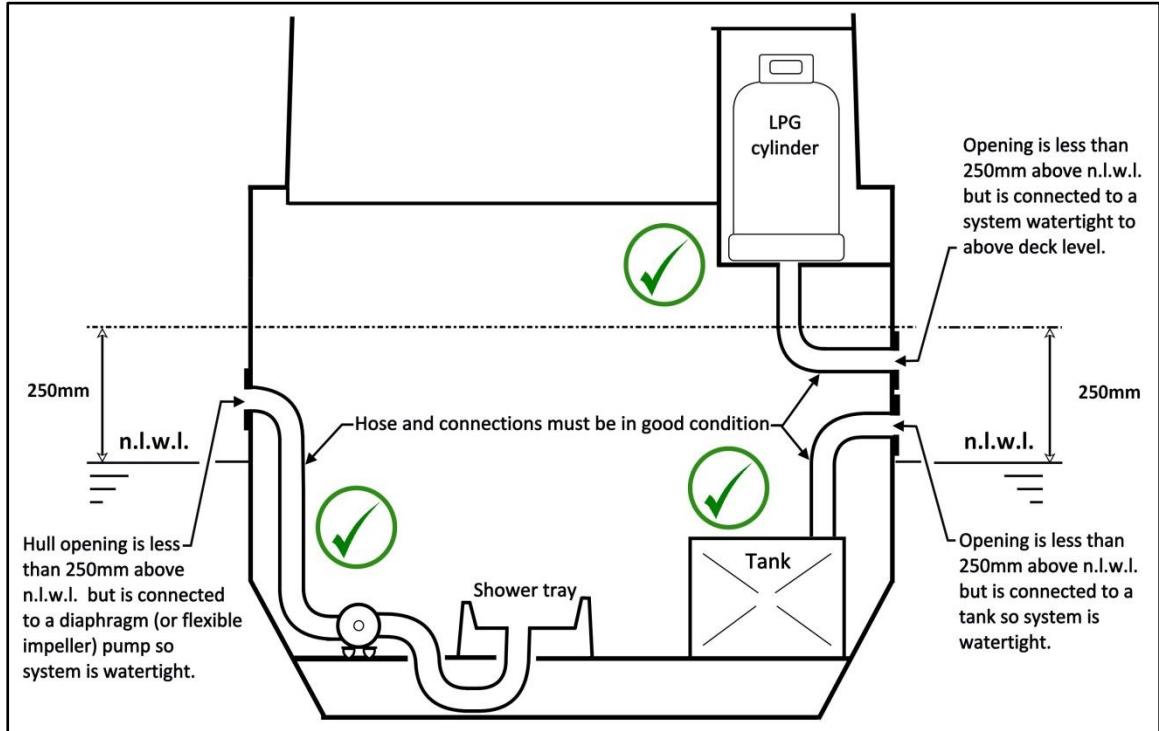
Fig 2 – Measuring downflooding heights

10c [4] SYSTEMS WATERTIGHT TO THE INTERIOR OF THE VESSEL

A hull opening is watertight to the interior of the vessel if river/canal water cannot potentially flow into the interior of the vessel through the opening (either directly or via internally connected pipes, hoses, ducts, or vessel structure, etc). The following are examples of potentially watertight systems:

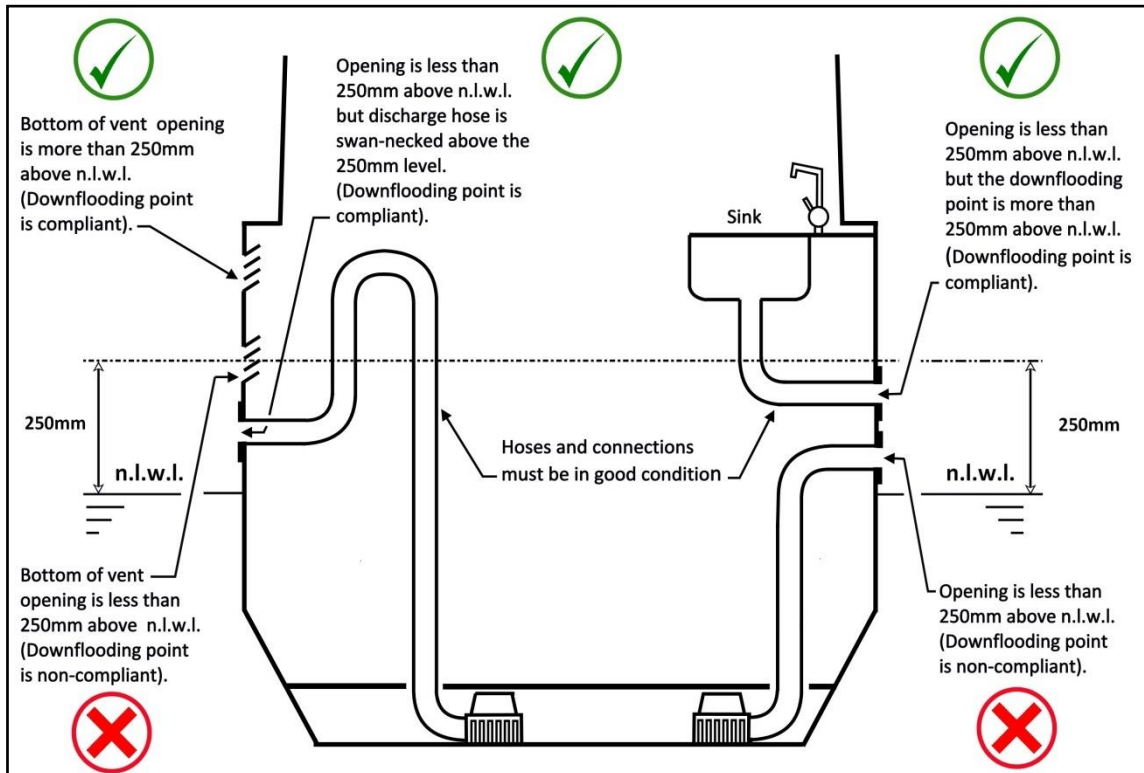
- Internal combustion engine exhausts (note - generally, exhaust systems on diesel heaters will not be watertight)
- Installations where internal pipework, etc, is connected directly to a diaphragm pump
- Installations where internal pipework, etc, is connected directly to a pump incorporating a flexible impeller within an housing
- Installations incorporating a non-return valve
- Tank systems (e.g. water tanks, and toilet holding tanks)

Fig 3 – Examples of systems watertight to the interior of the vessel



10c [5] EXAMPLES OF COMPLIANT AND NON-COMPLIANT DOWNFLOODING POINTS

Fig 4 – Examples of compliant and non-compliant downflooding points



10c [6] DOWNFLOODING POINTS WITHIN SELF-DRAINING COCKPITS AND WELL DECKS

When assessing downflooding points within self-draining cockpits and well decks Examiners should always start by determining whether the downflooding height is 250mm or greater. If the downflooding height is compliant (> 250mm) no further checking is necessary. However, as set out below, an alternative compliance option is permitted for downflooding points within self-draining cockpits and well decks.

ALTERNATIVE COMPLIANCE OPTION

Within self-draining cockpits and well decks the downflooding height may be less than 250mm provided the least height from the cockpit or well deck to the lowest downflooding point into the interior of the vessel is 150mm, or greater.

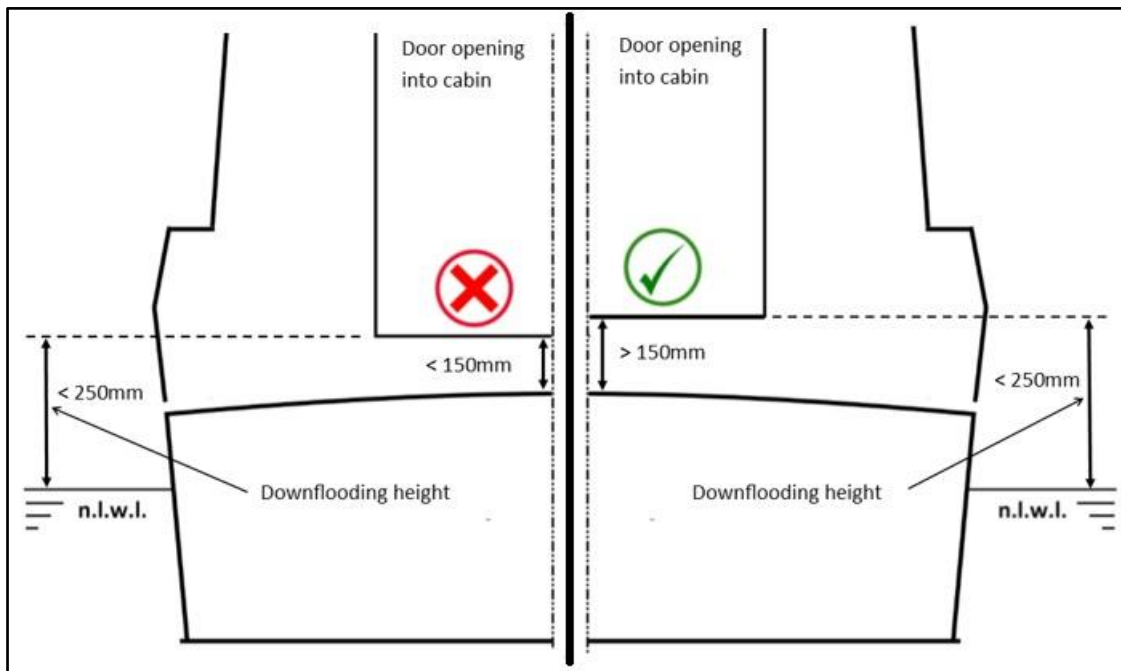


Fig 5a – Narrowboat well deck - example

The downflooding height is less than 250mm, so the actual downflooding height is non-compliant. However, the least height from the well deck to the downflooding point is greater than 150mm so downflooding is compliant with alternative compliance option.

Note – to benefit from the alternative compliance option the cockpit or well deck must be watertight to the interior of the vessel to a height of at least 150mm above the deck. As such, where a cockpit or well deck is cambered it is the vertical height from the highest part of the deck to the lowest downflooding point which must be 150mm or greater.

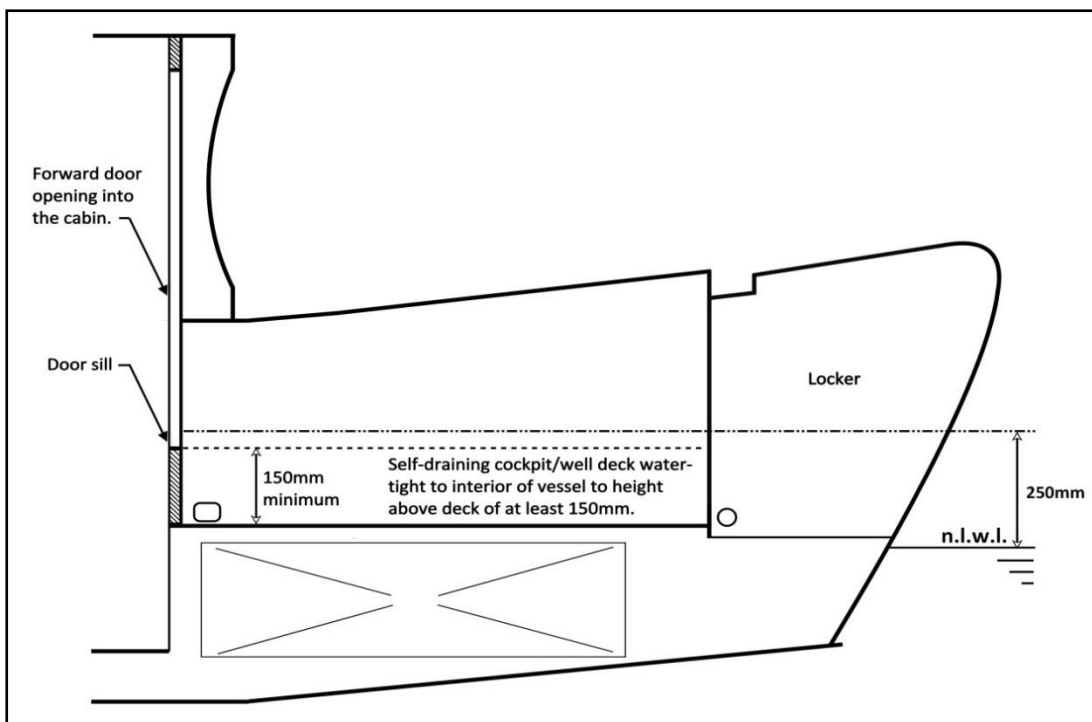


Fig 5b – Narrowboat well deck - example

The downflooding height to the door opening (sill) is less than 250mm, so the actual downflooding height is non-compliant. However, provided the well deck is watertight to the interior of the vessel to a minimum height above the well deck of 150mm the downflooding point is compliant with the alternative compliance option.

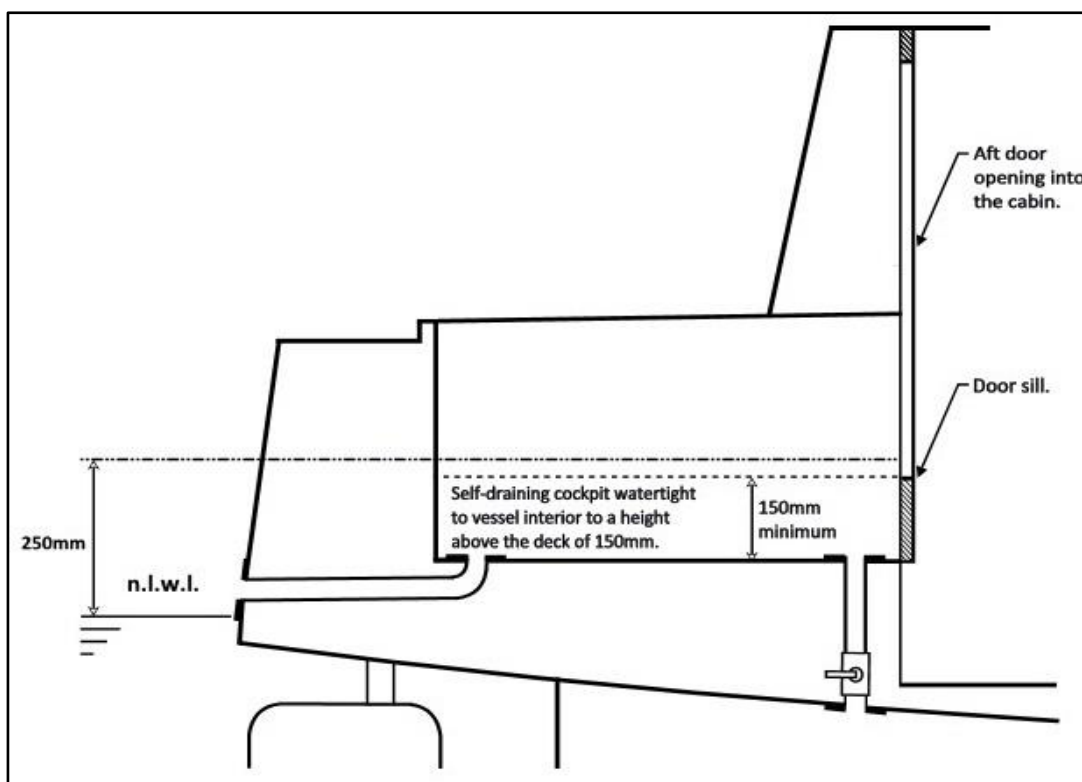


Fig 5c – Cruiser cockpit - example

The downflooding height to the door opening (sill) is less than 250mm, so the actual downflooding height is non-compliant. However, provided the cockpit deck is watertight to the interior of the vessel to a minimum height above the cockpit deck of 150mm the downflooding point is compliant with the alternative compliance option.