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RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part W NAVIGATION BRIDGE VISIBILITY

Chapter 1 GENERAL

1.1 General

1.1.1 Application

Navigation bridge visibility is to be in accordance with the requirements of this Part except ships of less than 55 *m* in length overall.

1.1.2 Ships of Unconventional Design*

With ships of unconventional design which, in the opinion of the Society cannot comply with the requirements of this Part, arrangements are to be provided to achieve a level of visibility that is as near as practical to those prescribed in this Part.

1.1.3 Definition

The definition of terms which appear in this Part are to be as specified in the following **(1)** to **(8)**, unless otherwise specified:

- (1) “Conning position” is a place on the bridge with a commanding view and which is used by navigators when commanding, manoeuvring and controlling a ship.
- (2) “Navigator” is a person navigating, operating bridge equipment and manoeuvring the ship.
- (3) “Workstation” is a position at which one or several tasks constituting a particular activity are carried out.
- (4) “Field of vision” is an angular size of a scene that can be observed from a position on the ship’s bridge.
- (5) “Main steering position” is a workstation that helmsman steers the ship manually in normal condition.
- (6) “Bridge” is an area from which the navigation and control of the ship is exercised, including the wheelhouse and bridge wings.
- (7) “Bridge wings” are parts of the bridge on both sides of the ship’s wheelhouse which extend to the ship’s side.
- (8) “Wheelhouse” is an enclosed area of the bridge.

1.1.4 Approval Drawings

Three copies of the following drawings are to be submitted for the approval by the Society.

- (1) General arrangement of the bridge (showing the conning position, bridge windows, doors, etc.)
- (2) Drawings showing the horizontal and vertical fields of vision from the conning position when the ship is in the condition deemed worst such as full load condition, light ballast condition, etc. (If the view from the conning position is obstructed by cargo, cargo gear or other obstructions outside of the wheelhouse, those obstructions are to be shown on the drawings)

Chapter 2 NAVIGATION BRIDGE VISIBILITY

2.1 Navigation Bridge Visibility

2.1.1 The View of the Sea Surface*

The view of the sea surface from the main conning position is not to be obscured by more than two ship length overall or 500m, whichever is less, forward of the bow to 10° on either side under all conditions of draught, trim and deck cargo.

2.1.2 Blind Sectors*

Blind sectors caused by cargo, cargo gear and other obstructions outside of the wheelhouse forward of the beam obstructing the view of the sea surface as seen from the conning position are not to exceed 10° each. The total arc of blind sectors is not to exceed 20°. The clear sectors between blind sectors are not to be less than 5°. However, in the view described in [2.1.1](#), each individual blind sector is not to exceed 5°.

2.1.3 Horizontal Field of Vision*

1 The horizontal field of vision from the main conning position is to extend over an arc of not less than 225°, that is from right ahead to not less than 22.5° abaft the beam on either side of the ship.

2 From each bridge wing the horizontal field of vision is to extend over an arc of at least 225°, that is at least 45° on the opposite bow through right ahead and then from right ahead to right astern through 180° on the same side of the ship.

3 From the main steering position the horizontal field of vision is to extend over an arc from right ahead to at least 60° on each side of the ship.

2.1.4 Ship's Side*

The ship's side is to be visible from the bridge wing.

2.1.5 Bridge Front Windows*

1 The height of the lower edge of the navigation bridge front windows above the bridge deck is to be kept as low as possible. The lower edge is not to obstruct the forward view in any case.

2 The upper edges of bridge front windows are to allow a forward view of the horizon, for a person with a height of eye of 1,800mm above at the main conning position, when the ship is pitching in heaving seas. The flag Government, if satisfied that a 1,800mm height of eye is unreasonable and impractical, allows reduction of the height of eye but not less than 1,600mm.

2.1.6 Navigation Bridge Visibility during Ballast Water Exchange

During the intermediate stages of ballast water exchange, navigation bridge visibility need not comply with [2.1.1](#) and [2.1.3](#).

2.2 Windows

2.2.1 Windows*

1 Framing between bridge windows is to be kept to a minimum and is not to be installed immediately forward of any workstation.

2 To help avoid reflections, bridge front windows are to be inclined from the vertical plane top out, at an angle of not less than 10° and not more than 25°.

3 Polarized and tinted windows are not to be fitted.

4 At all times regardless of weather conditions, at least two of the navigation bridge front windows is to provide a clear view, in addition depending on the bridge configuration, an additional number of windows is to provide a clear view.

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GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part W NAVIGATION BRIDGE VISIBILITY

W1 GENERAL

W1.1 General

W1.1.2 Ships of Unconventional Design

The use of remote camera systems for ships of unconventional design specified in [1.1.2 of the Rules](#) (excluding the ships mentioned in the provisory requirement specified in [2.1.4\(2\) of the Rules](#)) may be accepted as an alternative to [2.1.4 of the Rules](#) provided that they are deemed by the Society to comply with the following requirements (1) to (5), subject to acceptance by the flag state authority.

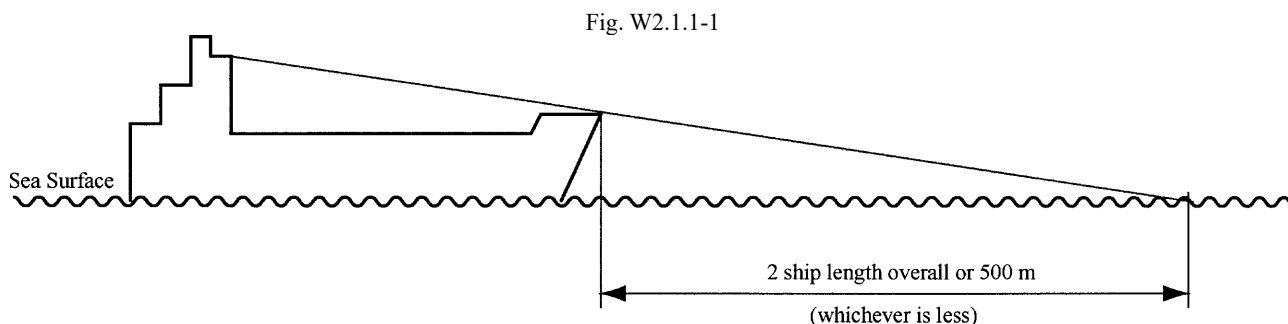
- (1) The remote camera systems are to be provided with the redundancy of the following equipment.
 - (a) Power cables and circuit breakers from the main switchboard to the camera and the screen
 - (b) Camera
 - (c) Screen
 - (d) Transmission lines from the camera to the display screen
 - (e) Components associated with these lines and cables
- (2) The remote camera systems are to be powered from the ship's main source of electrical power and are not required to be powered by the emergency source of electrical power.
- (3) The remote camera systems are to be capable of continuous operation under environmental conditions in [Table 7.1-1, Chapter 1, Part 7 of the Guidance for the Approval of Materials and Equipment for Marine Use](#).
- (4) The view provided by the remote camera systems is to be displayed at locations where the manoeuvring of the ship may take place.
- (5) The upper edge of the ship's side abeam is to be directly visible by the observer from locations where the manoeuvring of the ship may take place.

W2 NAVIGATION BRIDGE VISIBILITY

W2.1 Navigation Bridge Visibility

W2.1.1 The View of the Sea Surface

1 The view of the sea surface from the conning position is shown in [Fig. W2.1.1-1](#). The eye point to determine the view of the sea surface from the conning position is, as a standard, 1,800mm above the navigation deck and 750mm from the bridge front bulkhead (See [Fig. W2.1.5-1](#).)



2 The requirements given in [2.1.1, Part W](#) of the Rules may be exempted during the following temporary draught or trim conditions.

- (1) Temporally ballast condition at arrival;
- (2) Docking condition;
- (3) Light load condition; and
- (4) Others where deemed necessary by the Society.

W2.1.2 Blind Sectors

When blind sectors caused by large masts, cranes and other obstructions deemed as necessary for the purpose of the ship can not fulfill the requirements specified in [2.1.2, Part W of the Rules](#), two additional conning positions are to be provided at both sides of the navigation bridge, within 5m from the required main conning position so that all such blind sectors can be observed. In this case, the front windows of the additional conning positions are to be in accordance with [2.2.1-4, Part W of the Rules](#).

W2.1.3 Horizontal Field of Vision

1 Where the conning position is located on the centre-line, the horizontal field of vision from the conning position is shown in [Fig. W2.1.3-1](#).

2 The horizontal field of vision from each bridge wing is shown in [Fig. W2.1.3-2](#).

3 The horizontal field of vision from the main steering position is shown in [Fig. W2.1.3-3](#).

Fig. W2.1.3-1

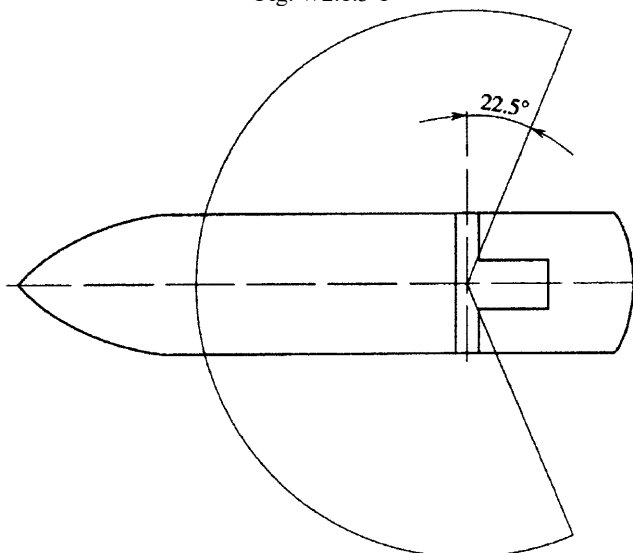


Fig. W2.1.3-2

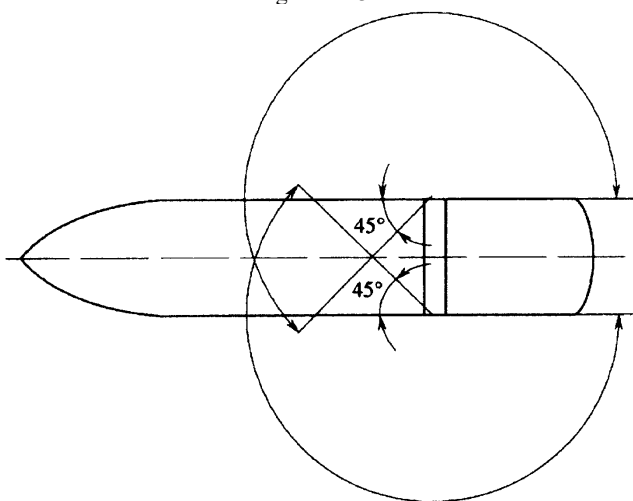
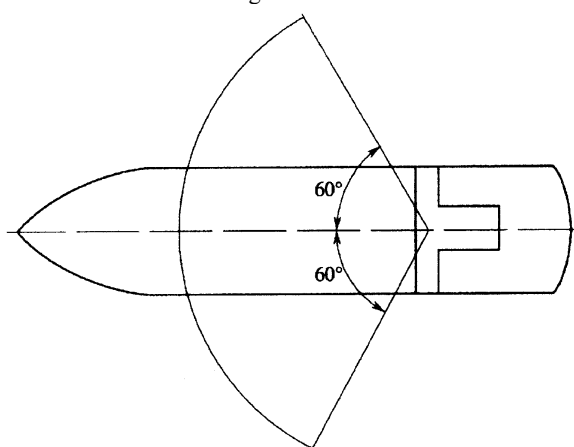


Fig. W2.1.3-3



W2.1.4 Ship's Side

The wording "The ship's side is to be visible from the bridge wing." in [2.1.4, Part W of the Rules](#) means the conditions

specified in the following (1) or (2):

- (1) The ship's side is to be visible from the bridge wing plus a distance corresponding to a reasonable and safe distance of a seafarer leaning out over the side of the bridge wing, which is not to be more than 400 *mm*, to the location vertically right under the maximum beam of the ship at the lowest seagoing draught. (see Fig. W2.1.4-1)
- (2) The sea surface is to be visible from the side of the bridge wing at the lowest seagoing draught and with a transverse distance of 500 *mm* and more from the maximum beam throughout the ship's length. (See Fig. W2.1.4-2) However, for ships such as tug/tow boats, offshore supply vessels, rescue ships and work ships (e.g., floating cranes) that are designed such that in normal operations, they come along side or operate in close proximity to other ships or offshore structures at sea, the sea surface is to be visible from the side of the bridge wing at the lowest seagoing draught and with a transverse distance of 1,500 *mm* and more from the maximum beam throughout the ship's length.

Fig. W2.1.4-1

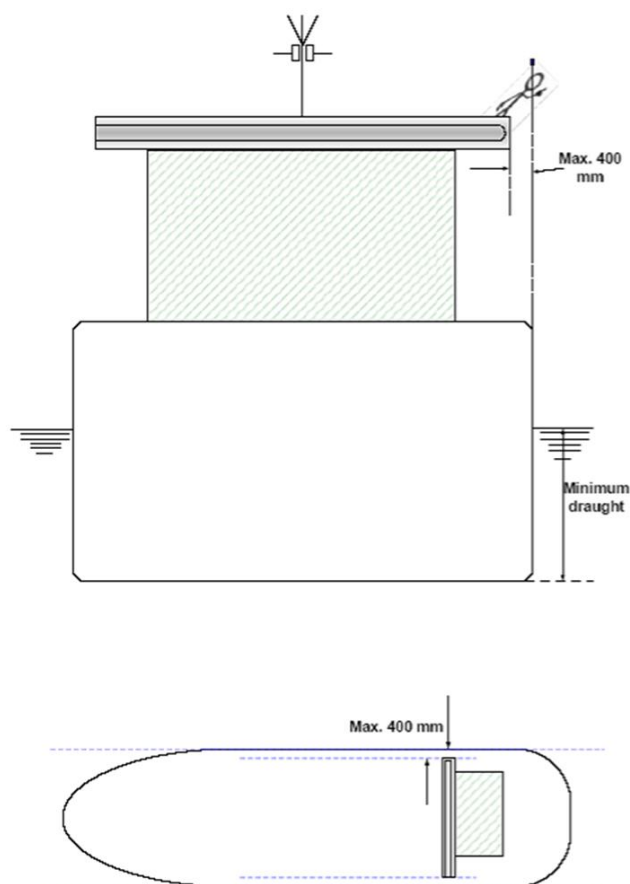
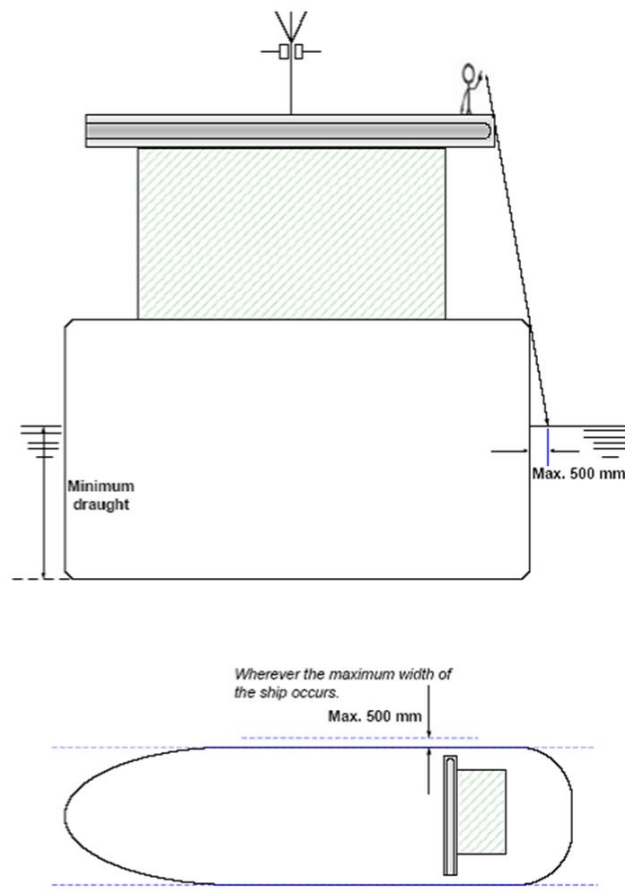


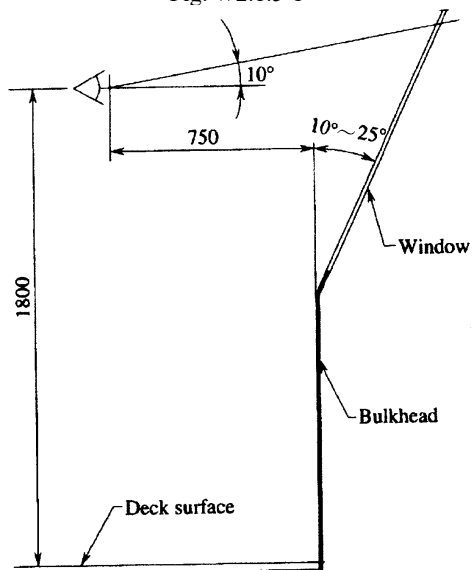
Fig. W2.1.4-2



W2.1.5 Bridge Front Windows

An example of the height of the upper edge of a bridge front window in the case of height of eye of $1,800\text{ mm}$ is shown in [Fig. W2.1.5-1](#).

Fig. W2.1.5-1



W2.2 Windows**W2.2.1 Windows**

- 1** It is recommended that the divisions between bridge front windows are not to exceed 150mm.
- 2** To ensure a clear view in bright sunshine, sunscreens with minimum colour distortion which are readily removable may be provided.
- 3** The wording “a clear view” specified in [2.2.1-4, Part W of the Rules](#) means clear view screens, wipers etc. with washing facility.
- 4** The bridge windows for ships operating in polar waters are to comply with 9.3.2.1.2, Part I-A of MSC.385(94) *International Code for Ships Operating in Polar Waters (Polar Code)* (as amended).