Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1)

Object of Amendment

Rules for the Survey and Construction of Steel Ships Part C

Reason for Amendment

Part C of the Rules and Guidance for the Survey and Construction of Steel Ships was revised comprehensively in July 2022, and there are plans to continuously review it with the aim of improving its practicality and usability based on various feedback from relevant industry members.

Additionally, insights gained through research and development will be appropriately reflected in Part C to enhance safety and rationality.

Accordingly, relevant requirements are amended to reflect rule review results and research and development outcomes.

Outline of Amendment

(1) Revises the reference of green sea pressure acting on the hatch covers used for strength assessment of cantilevers specified in 7.2.2, Part 1.
(2) Clarifies that, in the cargo hold analysis specified in 8.6.1.1 of Part 1, stress correction is required regardless of whether openings such as manholes are represented in the FE model.
(3) Clarifies the requirements for post-weld treatment procedures intended to improve fatigue strength specified in 9.5.6, Part 1.
(4) Clarifies the allowable stress for vertical loads due to water ballast in ballast holds specified in 14.6.5, Part 1.
(5) Adds structural details to be assessed for fatigue strength by finite element analysis for box-shaped bulk carriers fitted with bilge hopper tanks specified in 9.2.1, Part 2-2.
(6) Clarifies some definitions and corrects typographical errors.

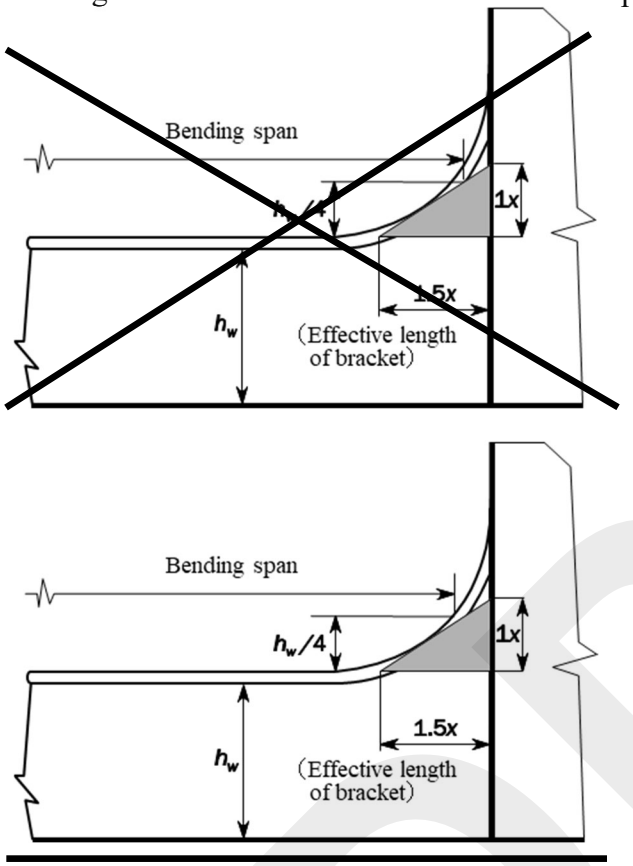
Effective Date and Application

1. This amendment applies to ships for which the date of contract for construction is on or after 1 July 2027.
2. Notwithstanding the preceding 1, this amendment may apply, upon request, to ships for which the date of contract for construction is before the effective date.

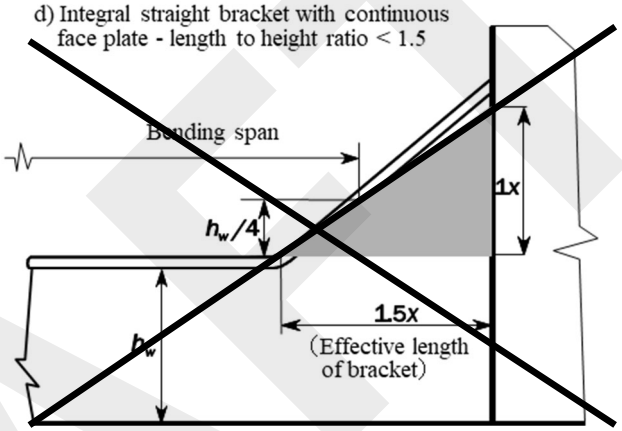
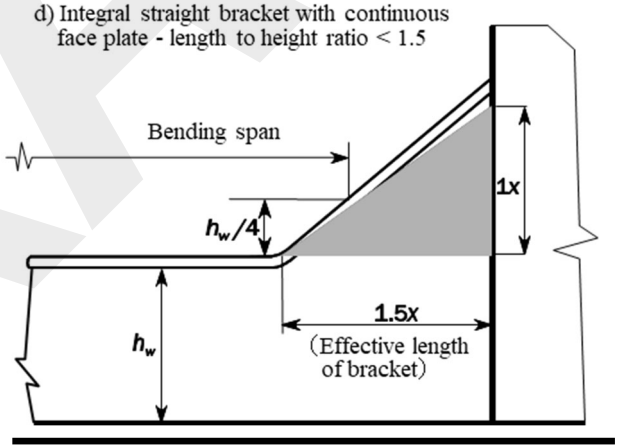
ID:DH26-02

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS **Part C HULL CONSTRUCTION AND EQUIPMENT** **Part 1 GENERAL HULL REQUIREMENTS** **Chapter 3 STRUCTURAL DESIGN PRINCIPLES** **3.6 Idealisation of Stiffeners and Primary Supporting Members** **3.6.1 Effective Span** **3.6.1.4 Effective Bending Span of Primary Supporting Members** **6** For curved brackets, where the tangent point between the fitted bracket and effective bracket is above the height h_w/4, the effective bending span is to be taken to the height h_w/4 at the effective bracket. Where the tangent point between the fitted bracket and effective bracket is below the height h_w/4, the effective bending span is to be taken to the height h_w/4 at the fitted bracket as shown in **Fig. 3.6.1-5 a)**.	**RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS** **Part C HULL CONSTRUCTION AND EQUIPMENT** **Part 1 GENERAL HULL REQUIREMENTS** **Chapter 3 STRUCTURAL DESIGN PRINCIPLES** **3.6 Idealisation of Stiffeners and Primary Supporting Members** **3.6.1 Effective Span** **3.6.1.4 Effective Bending Span of Primary Supporting Members** **6** For curved brackets, where the tangent point between the fitted bracket and effective bracket is above the height h_w/4, the effective bending span is to be taken to the height h_w/4 at the fitted bracket. Where the tangent point between the fitted bracket and effective bracket is below the height h_w/4, the effective bending span is to be taken to the height h_w/4 at the effective bracket as shown in **Fig. 3.6.1-5 a)**.	Amendment (6) Clarifies some definitions and corrects typographical errors. Revises the definition of effective bending span of primary supporting members to be consistent with Part CSR-B&T.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Fig. 3.6.1-5 Effective Bending Span of Primary Supporting Member a) Integral bracket with continuous curved face plate  	b) Separate welded brackets (Omitted)	Revises the figures of effective bending span of primary supporting members.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
c) Integral straight bracket with continuous face plate - length to height ratio > 1.5 (Omitted)	d) Integral straight bracket with continuous face plate - length to height ratio < 1.5   	
e) Small back bracket (Omitted)	f) Large back bracket (Omitted)	

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks

Chapter 4 LOADS

4.4 Loads to be Considered in Local Strength

4.4.2 Maximum Load Condition

4.4.2.4 Internal Pressure due to Liquid Loaded

2 Dynamic pressure P_{ld} (kN/m^2) acting on tanks and ballast holds loaded with liquids is to be as specified in **Table 4.4.2-8**.

Chapter 4 LOADS

4.4 Loads to be Considered in Local Strength

4.4.2 Maximum Load Condition

4.4.2.4 Internal Pressure due to Liquid Loaded

2 Dynamic pressure P_{ld} (kN/m^2) acting on tanks and ballast holds loaded with liquids is to be as specified in **Table 4.4.2-8**.

Table 4.4.2-8 Dynamic Pressure P_{ld} Acting in Tanks or Ballast Holds Loaded with Liquids

Type of loaded compartment	Dynamic pressure P_{ld} (kN/m^2)(1)(2)	
	$z \le z_{top}$	$z > z_{top}$
Cargo tanks fully loaded with liquid cargo including liquefied gas, ballast holds and liquefied gas fuel tanks	$\rho_L\sqrt{[C_{WDx}a_{Xe-l}(x_{TG}-x)]^2+\left[C_{WDy}a_{Ye-l}(y_{TG}-y)\right]^2+[C_{WDz}a_{Ze-l}(z_0-z)]^2}$	0
Others (e.g. ballast tanks)(6)	$\rho_L\sqrt{[C_{WDx}a_{Xe-l}(x_0-x)]^2+\left[C_{WDy}a_{Ye-l}(y_0-y)\right]^2+[C_{WDz}a_{Ze-l}(z_0-z)]^2}$	0

Notes:
(Omitted)
C_{WDz}: Coefficient for load condition to be taken as:

In *HF*,

For $0.0 \le x_{CWD}/L_C \le 0.3, C_{WDz} = -2.73\frac{x_{CWD}}{L_C} + 1.0$

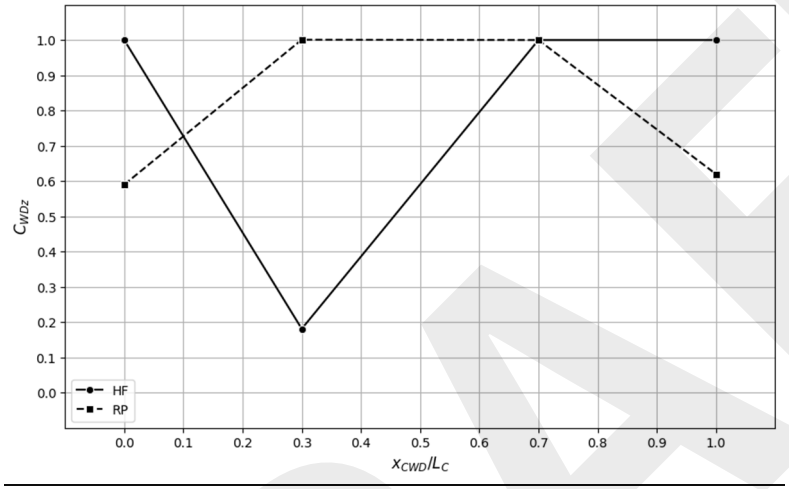
For $0.3 < x_{CWD}/L_C \le 0.7, C_{WDz} = 2.05\frac{x_{CWD}}{L_C} - 0.435$

For $0.7 < x_{CWD}/L_C \le 1.0, C_{WDz} = 1.0$

In *RP*,

For $0.0 \le x_{CWD}/L_C \le 0.3, C_{WDz} = 1.37\frac{x_{CWD}}{L_C} + 0.59$

For $0.3 < x_{CWD}/L_C \le 0.7, C_{WDz} = 1.0$

Amended	Original	Remarks
For $0.7 < x_{CWD}/L_C \leq 1.0$, $C_{WDz} = -1.27\frac{x_{CWD}}{L_C} + 1.89$ x_{CWD}: X coordinate (m) at the calculation point for the coefficient for the load condition, to be taken as the X coordinate (m) at the volumetric centre of gravity of the tank or ballast hold under consideration  (Omitted)		Amendment (6) Clarifies some definitions and corrects typographical errors. Adds a figure showing the coefficient of distribution along the ship length.
(Omitted)		
4.8 Loads to be Considered in Additional Structural Requirements	**4.8 Loads to be Considered in Additional Structural Requirements**	
4.8.2 Maximum Load Condition	**4.8.2 Maximum Load Condition**	
4.8.2.3 Bow Impact Pressure **1** For ships with large bow flares that operate at high speed (e.g. car carriers, container carriers, Ro-Ro ships, LNG carriers and refrigerated LPG carriers), the bow impact pressure P_{FB1} (kN/m^2) specified in **Table 4.8.2-6** is to be considered.	**4.8.2.3 Bow Impact Pressure** **1** For ships with large bow flares that operate at high speed (e.g. car carriers, container carriers, Ro-Ro ships, LNG carriers and refrigerated LPG carriers), the bow impact pressure P_{FB1} (kN/m^2) specified in **Table 4.8.2-6** is to be considered.	

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks

Table 4.8.2-9 Bow Impact Pressure P_{FB2}

Positions under consideration	Bow impact pressure P_{FB2} (kN/m^2)
Positions forward of $0.1L_C$ from the forward perpendicular and ~~positions~~, in the vertical direction, above the minimum design ballast draught and the forecastle	$P_{FB2} = \rho f_{FB} c_{FB} {V_{im}}^2 \sin\gamma_{wl}$

Notes:

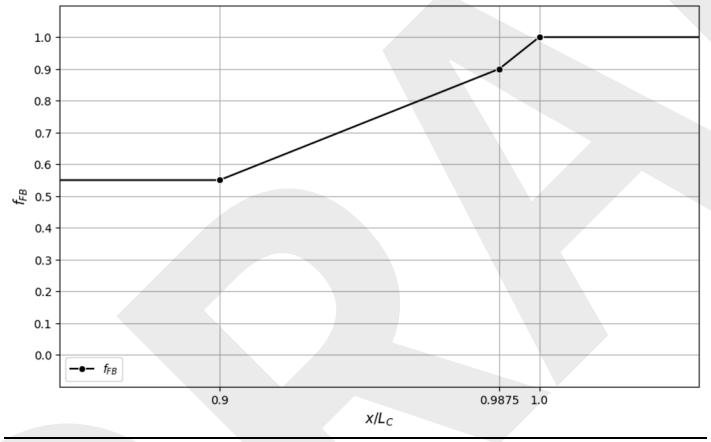
f_{FB}: Coefficient for bow flare impact pressure distribution in the longitudinal direction, as given by the following formulae:

For $x/L_C \leq 0.9, f_{FB} = 0.55$

For $0.9 < x/L_C \leq 0.9875, f_{FB} = 4(x/L_C - 0.9) + 0.55$

For $0.9875 < x/L_C \leq 1.0, f_{FB} = 8(x/L_C - 0.9875) + 0.9$

For $1.0 < x/L_C, f_{FB} = 1.0$



(Omitted)

Amendment (6)

Clarification of the definition and correction of editorial errors.

Clarifies positions under consideration.

Adds a figure showing the coefficient of distribution along the ship length.

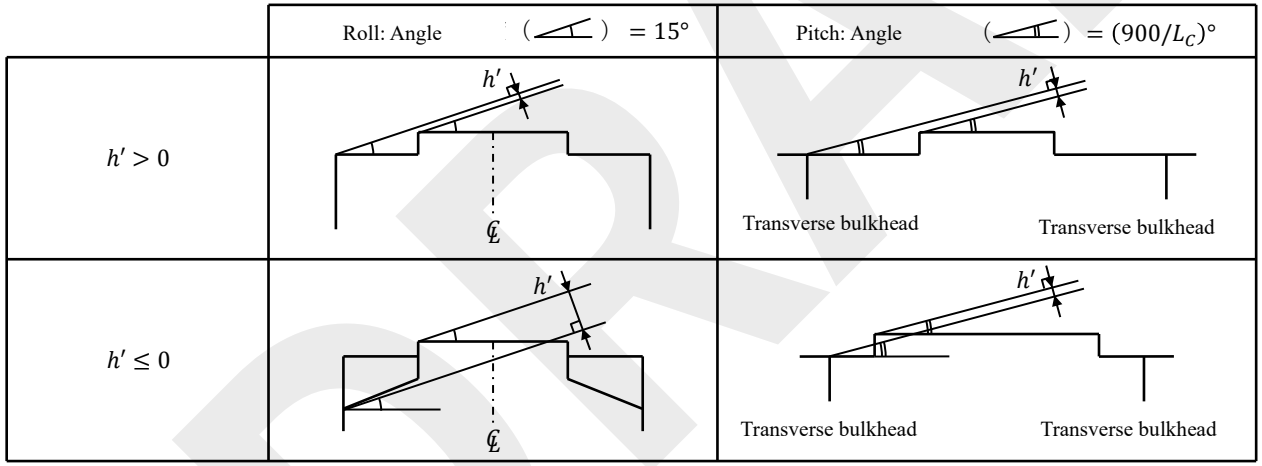
Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
4.10 Loads to be Considered <u>for</u> Equipment	**4.10 Loads to be Considered <u>in</u> Equipment**	
4.10.3 Loads to be Considered in Strength Assessment of Steel Hatch Covers and Hatch Coamings of Ballast Hold Hatchways	**4.10.3 Loads to be Considered in Strength Assessment of Steel Hatch Covers and Hatch Coamings of Ballast Hold Hatchways**	
4.10.3.1 Vertical Loads due to Ballast **1** Load h (kN/m^2) acting on the steel hatch covers of exposed parts of the upper deck provided in cargo holds which may be ballasted or similar hatch covers and hatch coamings is to be in accordance with the following: (1) Load h (kN/m^2) acting on the top plate is to be in accordance with the following formula: $h = 9.81 \times 0.85(16\,a/L_C + 0.25b + h')$ a: Length (m) of hatchways b: Breadth (m) of hatchways h': Vertical distance (m) to the highest point of the top plates of tanks from the highest points of hatch covers around tanks when the ship is inclined at roll angle of 15 *degrees* and pitch angle of $900/L_C$ *degrees*. In any case, h' is not to be less than 0 (*See* **Fig. 4.10.3-1**). (2) Load h (kN/m^2) acting on stiffeners is to be in accordance with the following formulae: For transverse direction (where hatch covers are opened/closed in the longitudinal direction), $h = 9.81 \times 0.85(12\,a/L_C + 0.125b + h')$ For longitudinal direction (where hatch covers are opened/closed in the transverse direction), $h = 9.81 \times 0.85(8\,a/L_C + 0.188b + h')$	**4.10.3.1 Vertical Loads due to Ballast** **1** Load h (kN/m^2) acting on the steel hatch covers of exposed parts of the upper deck provided in cargo holds which may be ballasted or similar hatch covers and hatch coamings is to be in accordance with the following: (1) Load h (kN/m^2) acting on the top plate is to be in accordance with the following formula: $h = 9.81 \times 0.85\left(16\,a/L_C + 0.25b + h'\right)$ a: Length (m) of hatchways b: Breadth (m) of hatchways h' : Vertical distance (m) to the highest point of the top plates of tanks from the highest points of hatch covers around tanks when the ship is inclined at roll angle of 15 degrees and pitch angle of $900/L_C$ degrees. In any case, h' is not to be less than 0 (*See* **Fig. 4.10.3-1**). (2) Load h (kN/m^2) acting on stiffeners is to be in accordance with the following formulae: For transverse direction (where hatch covers are opened/closed in the longitudinal direction), $h = 9.81 \times 0.85\left(12\,a/L_C + 0.125b + h'\right)$ For longitudinal direction (where hatch covers are opened/closed in the transverse direction), $h = 9.81 \times 0.85\left(8\,a/L_C + 0.188b + h'\right)$	

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

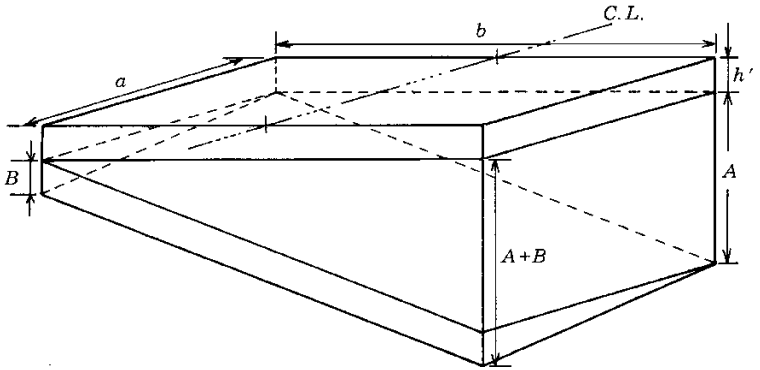
Amended	Original	Remarks
a, b and h': As specified in **(1)** above **2** When the scantlings of hatch covers are determined by finite element analysis, the load due to ballast water is to be 0.85 *times* the value specified in **Fig. 4.10.3-2**. However, the corner where the maximum load acts is to be an arbitrary place. Where only girders are modelled and the Society deems it appropriate, the values specified in **-1(2)** above may be used for the load.	a, b and h' : As specified in **(1)** above **2** When the scantlings of hatch covers are determined by finite element analysis, the load du to ballast water is to be 0.85 *times* the value specified in **Fig. 4.10.3-2**. However, the corner where the maximum load acts is to be an arbitrary place. Where only girders are modelled and the Society deems it appropriate, the values specified in **-1** above may be used for the load.	Amendment (6) Clarification of the definition and correction of editorial errors. Clarifies the vertical loads due to water ballast in ballast holds when only girders are modelled and deemed appropriate by the Society.

Fig. 4.10.3-1 Method for Measuring h'



Amended	Original	Remarks

Fig. 4.10.3-2 Load Acting on Ballast Hold in Finite Element Analysis

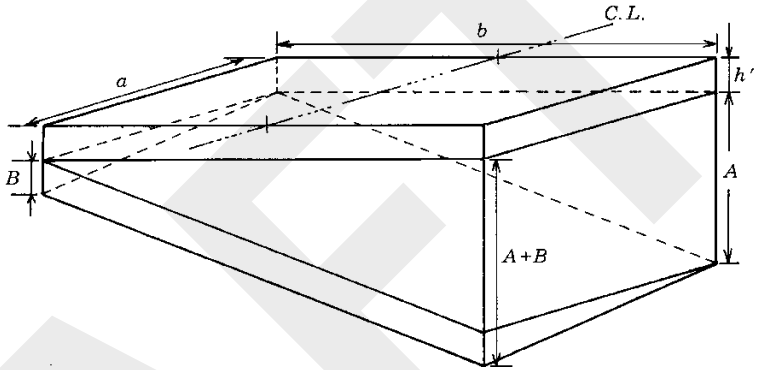


Notes:

A: Additional water head due to the roll, to be taken as $0.25b$

B: Additional water head due to the pitch, to be taken as $16\,a/L_C$

Fig. 4.10.3-2 Load Acting on Ballast Hold in Finite Element Analysis



Notes:

A: Additional water head due to the roll, to be taken as $0.25b$

B: Additional water head due to the pitch, to be taken as $16\,a/L_C$

Annex 5.1 EXTENT OF HIGH TENSILE STEEL

An1.2 Vertical Extent

Table An1 Stresses at Baseline and Deck

Condition	Baseline	Deck
~~Seagoing~~ Maximum load condition	$\sigma_{bl} = \frac{\lvert M_{SW} + M_{WV} \rvert}{I_{gr}} z_n \times 10^5$	$\sigma_{dk} = \frac{\lvert M_{SW} + M_{WV} \rvert}{I_{gr}} V_D \times 10^5$
Harbour condition	$\sigma_{bl} = \frac{\lvert M_{SW-p} \rvert}{I_{gr}} z_n \times 10^5$	$\sigma_{dk} = \frac{\lvert M_{SW-p} \rvert}{I_{gr}} V_D \times 10^5$
V_D: Refer to **5.2.1.2**		

Annex 5.1 EXTENT OF HIGH TENSILE STEEL

An1.2 Vertical Extent

Amendment (6)
Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the namings used for load scenarios in Part C.

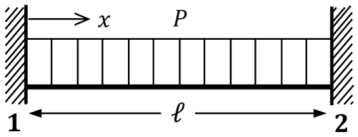
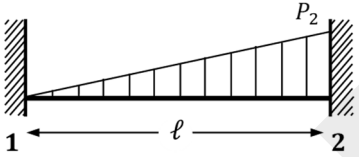
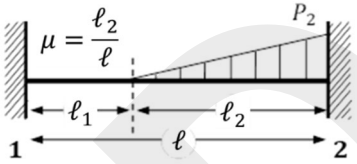
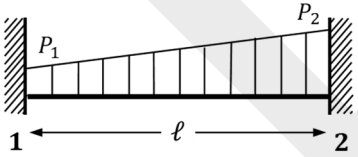
<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr>
<td>

Chapter 7 STRENGTH OF PRIMARY SUPPORTING STRUCTURES

7.2 Simple Girders

7.2.2 Strength Assessment

Table 7.2.2-1 Moments and Shear Forces

	Assessment model	M	F
1	 $P = P_1 = P_2$	$M_1 = M_2 = \frac{SP\ell_{bdg}{}^2}{12}$	$F_1 = F_2 = \frac{SP\ell_{shr}}{2}$
2	 $P_1 = 0$	$M_1 = \frac{SP_2\ell_{bdg}{}^2}{30}$ $M_2 = \frac{SP_2\ell_{bdg}{}^2}{20}$	$F_1 = \frac{3SP_2\ell_{shr}}{20}$ $F_2 = \frac{7SP_2\ell_{shr}}{20}$
3		$M_1 = -\frac{SP_2\ell_{bdg}{}^2}{60}(3\mu^4 - 5\mu^3)$ $M_2 = \frac{SP_2\ell_{bdg}{}^2}{60}(3\mu^4 - 10\mu^3 + 10\mu^2)$	$F_1 = -\frac{SP_2\ell_{shr}}{20}(2\mu^4 - 5\mu^3)$ $F_2 = \frac{SP_2\ell_{shr}}{20}(2\mu^4 - 5\mu^3 + 10\mu)$
4		$M_1 = \frac{S\ell_{bdg}{}^2}{60}(3P_1 + 2P_2)$ $M_2 = \frac{S\ell_{bdg}{}^2}{60}(2P_1 + 3P_2)$	$F_1 = \frac{S\ell_{shr}}{20}(7P_1 + 3P_2)$ $F_2 = \frac{S\ell_{shr}}{20}(3P_1 + 7P_2)$

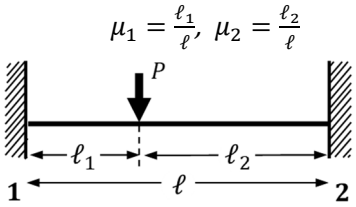
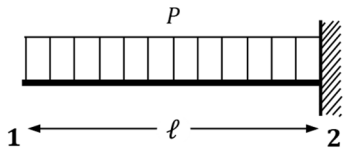
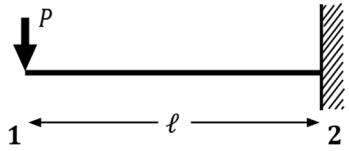
</td>
<td>

Chapter 7 STRENGTH OF PRIMARY SUPPORTING STRUCTURES

7.2 Simple Girders

7.2.2 Strength Assessment

</td>
<td></td>
</tr>
</table>

Amended			Original		Remarks
5			$M_1 = P\mu_1{\mu_2}^2\ell_{bdg}$ $M_2 = P{\mu_1}^2\mu_2\ell_{bdg}$	$F_1 = P{\mu_2}^2(3\mu_1 + \mu_2)$ $F_2 = P{\mu_1}^2(3\mu_2 + \mu_1)$	
6			$M_2 = \frac{SP{\ell_{bdg}}^2}{2}$	$F_2 = SP\ell_{shr}$	
7			$M_2 = P\ell_{bdg}$	$F_2 = P$	
(Omitted) P: Load corresponding to each assessment condition specified in **Table 7.2.1-1** to be taken as follows depending on the assessment model: Assessment Model 1: Uniform load (kN/m^2) acting on the girder Assessment Model 5: Concentrated load (kN) acting on the girder Assessment Model 6: Average lateral load (kN/m^2) acting on the deck to be taken as the greater of the cargo load or green sea load in the maximum load condition specified in **4.4.2.2**. These loads are to be calculated at the midpoint of the span ℓ. Assessment Model 7: Load (kN) due to the cargo loaded on the hatch cover to be taken as follows: $P_B = S\mathrm{BP}_h$ B: A half of the breadth (m) of the hatch in the deck supported by deck transverses P_h: Load (kN/m^2) acting on the hatch cover as specified in **4.4.2.7** or ~~**4.10.2.1**~~ **4.4.2.8** (Omitted)					Amendment (1) Revises the reference for green sea pressure acting on hatch covers.

Amended	Original	Remarks
Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS **8.6 Strength Assessment** **8.6.1 Yield Strength Assessment** **8.6.1.1 Reference Stress** **3** In applying **-1** above, the shear stress and the stress in the spanwise direction of girder around the opening are to be corrected in consideration of the effective shear area of the web and the reference stress σ_{eq-cor} is to be calculated. The effective shear area of the web is to be taken as the web area deducting the area lost due to openings in accordance with the following **(1)** or **(2)**. However, the calculation of the stress may be omitted where it is obvious that the results of the yield strength assessment are not significantly affected. (1) When both sides of the web are plating, the reference stress σ_{eq-cor} is to be calculated with the shear stress modified in accordance with the following formula: $\sigma_{eq-cor} = \sqrt{{\sigma_{elem-s}}^2 - \sigma_{elem-s} \cdot \sigma_{elem-d} + {\sigma_{elem-d}}^2 + 3{\tau_{cor}}^2}$ σ_{elem_s}: Stress in the spanwise direction of the girder (N/mm^2) before correction. σ_{elem_d}: Stress in the depth direction of the girder (N/mm^2) before correction. τ_{cor}: Corrected shear stress (N/mm^2), to	**Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.6 Strength Assessment** **8.6.1 Yield Strength Assessment** **8.6.1.1 Reference Stress** **3** In applying **-1** above, <u>for locations with an opening that has not been modelled</u>, the shear stress and the stress in the spanwise direction of girder around the opening are to be corrected in consideration of the effective shear area of the web and the reference stress σ_{eq-cor} is to be calculated. The effective shear area of the web is to be taken as the web area deducting the area lost due to openings in accordance with the following **(1)** or **(2)**. However, the calculation of the stress may be omitted where it is obvious that the results of the yield strength assessment are not significantly affected. (1) When both sides of the web are plating, the reference stress σ_{eq-cor} is to be calculated with the shear stress modified in accordance with the following formula: $\sigma_{eq-cor} = \sqrt{{\sigma_{elem-s}}^2 - \sigma_{elem-s} \cdot \sigma_{elem-d} + {\sigma_{elem-d}}^2 + 3{\tau_{cor}}^2}$ σ_{elem_s}: Stress in the spanwise direction of the girder (N/mm^2) before correction. σ_{elem_d}: Stress in the depth direction of the girder (N/mm^2) before correction. τ_{cor}: Corrected shear stress (N/mm^2), to	Amendment (2) Clarifies that the stress correction is required regardless of whether openings such as manholes are represented in the FE model. However, as before, it may be omitted in locations where the effect of the correction is considered to be minor.

Amended	Original	Remarks
be taken as follows. $\tau_{cor} = \frac{ht_{mod-n50}}{A_{shr-n50}}\tau_{elem\_ave}$ τ_{elem_ave}: Shear stress (N/mm^2) before correction, taken as the average shear stress value in the girder depth direction. h: Height (mm) of the girder web in way of the opening. Where the geometry of the opening is modelled, h is to be taken as the height of web of the girder deducting the height of the modelled opening. $t_{mod-n50}$: Modelled web thickness (mm) in way of the opening. $A_{shr-n50}$: Effective net shear area of the web(mm^2) taken as the web area deducting of the area lost due to the openings calculated with the effective web height h_{eff} (mm). h_{eff} is to be taken as the lesser of the following, where the third formula is only taken into account for an opening located at a distance less than $h_w/3$ from the cross section to be considered. $h_{eff} = h_w$ $h_{eff} = h_{w3} + h_{w4}$ $h_{eff} = h_{w1} + h_{w2} + h_{w4}$ h_w: Web height of primary supporting member h_{w1}, h_{w2}, h_{w3}, h_{w4}: Dimensions shown in **Fig. 8.6.1-1** (2) (Omitted)	be taken as follows. $\tau_{cor} = \frac{ht_{mod-n50}}{A_{shr-n50}}\tau_{elem\_ave}$ τ_{elem_ave}: Shear stress (N/mm^2) before correction, taken as the average shear stress value in the girder depth direction. h: Height (mm) of the girder web in way of the opening. $t_{mod-n50}$: Modelled web thickness (mm) in way of the opening. $A_{shr-n50}$: Effective net shear area of the web(mm^2) taken as the web area deducting of the area lost due to the openings calculated with the effective web height h_{eff} (mm). h_{eff} is to be taken as the lesser of the following, where the third formula is only taken into account for an opening located at a distance less than $h_w/3$ from the cross section to be considered. $h_{eff} = h_w$ $h_{eff} = h_{w3} + h_{w4}$ $h_{eff} = h_{w1} + h_{w2} + h_{w4}$ h_w: Web height of primary supporting member h_{w1}, h_{w2}, h_{w3}, h_{w4}: Dimensions shown in **Fig. 8.6.1-1** (2) (Omitted)	Following Part CSR-B&T, a provision has been added to address the case where openings are represented in the FE model.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Chapter 9 FATIGUE **9.5 Fatigue Strength Assessment** **9.5.6 Fatigue Strength Improvement Method** **9.5.6.3 Post-Weld Treatment Procedure** When controlling the weld toe geometry by grinding, the following procedure is to be followed. (1) The grinding area is to be in accordance with the following **(a)** and **(b)**. (a) For welds other than corner boxing welds, the grinding area is to be extended not less than 10 times the plate thickness to both sides of the hot spot. (b) For corner boxing welds, the grinding area is to be extended not less than 30 *mm* from the corner. (2) The depth of grinding is to be at least 0.5 *mm* but less than the lesser of 2 *mm* and $0.07t_{as-build}$ (mm) along the weld toe, and visible undercuts and notches are to be removed. (3) The resulting radius of the weld toe is to be not less than $0.25t_{as-build}$ (*mm*).	**Chapter 9 FATIGUE** **9.5 Fatigue Strength Assessment** **9.5.6 Fatigue Strength Improvement Method** **9.5.6.3 Post-Weld Treatment Procedure** When controlling the weld toe geometry by grinding, the following procedure is to be followed. (1) For fillet welds, the grinding area is to be extended not less than 10 times the plate thickness to both sides of the hot spot. (2) When grinding a corner boxing weld, the area in the range of 30 *mm* from the corner is to be ground. (3) The depth of grinding is to be at least 0.5 *mm* but less than 2 *mm* or $0.07t_{as-build}$ (mm) along the weld toe, and visible undercuts and notches are to be removed. (4) The resulting radius of the weld toe is to be not less than $0.25t_{as-build}$ (*mm*).	Amendment (3) Clarifies the requirements for post-weld treatment procedures intended to improve fatigue strength.

Amended	Original	Remarks
Chapter 10 ADDITIONAL STRUCTURAL REQUIREMENTS	**Chapter 10 ADDITIONAL STRUCTURAL REQUIREMENTS**	
10.6 Strengthened Bottom Forward	**10.6 Strengthened Bottom Forward**	
10.6.2 General Ships (Ship other than those with L_C of not more than 150 *m*, $V/\sqrt{L_C}$ of not less than 1.4 and C_B of not more than 0.7)	**10.6.2 General Ships (Ship other than those with L_C of not more than 150 *m*, $V/\sqrt{L_C}$ of not less than 1.4 and C_B of not more than 0.7)**	
10.6.2.2 Structural Arrangement The structural arrangement is to be in accordance with the following **(1)** and **(2)**. (1) Structural arrangement (a) Between the collision bulkhead and $0.05L_C$ abaft the after end of the strengthened bottom forward, side girders are to be spaced not more than approximately 2.3 *m* apart (*See* **Fig. 10.6.2-1**). Where transverse framing is adopted, shell longitudinals are to be provided between the side girders, between the collision bulkhead and $0.025L_C$ abaft the after end of the strengthened bottom forward. (b) Between the collision bulkhead and the after end of the strengthened bottom forward, solid floors are to be provided at every frame in the transverse framing system, or at least at alternate side frames in the longitudinal framing system. (c) The solid floors are to be reinforced by providing vertical stiffeners in way of shell longitudinals. However, where the spacing of the shell	**10.6.2.2 Structural Arrangement** The structural arrangement is to be in accordance with the following **(1)** and **(2)**. (1) Structural arrangement (a) Between the collision bulkhead and $0.05L_C$ abaft the after end of the strengthened bottom forward, side girders are to be spaced not more than approximately 2.3 *m* apart (*See* **Fig. 10.6.2-1**). Where transverse framing is adopted, shell longitudinals are to be provided between the side girders, between the collision bulkhead and $0.025L_C$ abaft the after end of the strengthened bottom forward. (b) Between the collision bulkhead and the after end of the strengthened bottom forward, solid floors are to be provided at every frame in the transverse framing system, or at least at alternate frames in the longitudinal framing system. (c) The solid floors are to be reinforced by providing vertical stiffeners in way of shell longitudinals. However, where the spacing of the shell	Amendment (6) To follow the previous practice, the wording has been aligned with that used in old Part C.

Amended	Original	Remarks
longitudinals is especially small and the solid floors are adequately reinforced, the vertical stiffeners for the solid floors may be provided on alternate shell longitudinals. (2) (Omitted) **Chapter 14 EQUIPMENT** **14.6 Hatch Cover** **14.6.5 Strength Criteria of Hatch Covers** **14.6.5.1 Permissible Stresses and Deflections** **1** All hatch cover structural members are to comply with the following formulae: $\sigma_{vm} \leq \sigma_a$ for shell elements in general. $\sigma_{axial} \leq \sigma_a$ for rod or beam elements in general. Where: σ_a: Allowable stress as defined in **Table 14.6.5-1** σ_{vm} : Von Mises stress (N/mm^2) to be taken as follows: $\sigma_{vm} = \sqrt{{\sigma_x}^2 - \sigma_x\sigma_y + {\sigma_y}^2 + 3\tau_{xy}^2}$ σ_{axial}: Axial stress (N/mm^2) in rod or beam elements σ_x : Normal stress (N/mm^2) in the x-direction (N/mm^2) σ_y : Normal stress (N/mm^2) in the y-direction (N/mm^2) τ_{xy} : Shear stress (N/mm^2) in the x-y plane x, y : Coordinates of a two-dimensional Cartesian	longitudinals is especially small and the solid floors are adequately reinforced, the vertical stiffeners for the solid floors may be provided on alternate shell longitudinals. (2) (Omitted) **Chapter 14 EQUIPMENT** **14.6 Hatch Cover** **14.6.5 Strength Criteria of Hatch Covers** **14.6.5.1 Permissible stresses and deflections** **1** All hatch cover structural members are to comply with the following formulae: $\sigma_{vm} \leq \sigma_a$ for shell elements in general. $\sigma_{axial} \leq \sigma_a$ for rod or beam elements in general. Where: σ_a: Allowable stress as defined in **Table 14.6.5-1** σ_{vm} : Von Mises stress (N/mm^2) to be taken as follows: $\sigma_{vm} = \sqrt{{\sigma_x}^2 - \sigma_x\sigma_y + {\sigma_y}^2 + 3\tau_{xy}^2}$ σ_{axial}: Axial stress (N/mm^2) in rod or beam elements σ_x : Normal stress (N/mm^2) in the x -direction (N/mm^2) σ_y : Normal stress (N/mm^2) in the y -direction (N/mm^2) τ_{xy} : Shear stress (N/mm^2) in the x-y plane x, y : Coordinates of a two-dimensional Cartesian	

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td>system in the plane of the considered structural element
σ_Y: Specified minimum yield stress (N/mm^2) of the material. However, when material with σ_Y of more than 355 (N/mm^2) is used, the value for σ_Y is to be as deemed appropriate by the Society.</td><td>system in the plane of the considered structural element
σ_Y: Specified minimum yield stress (N/mm^2) of the material. However, when material with σ_Y of more than 355 (N/mm^2) is used, the value for σ_Y is to be as deemed appropriate by the Society.</td><td></td></tr>
<tr><td>Table 14.6.5-1 Allowable Stresses
<table><tr><th>Members of</th><th>Subject to</th><th>σ_a (N/mm^2)</th></tr><tr><td rowspan="2">Hatch cover structure</td><td>External pressure, as defined in 4.10.2.1</td><td>$0.80\sigma_Y$</td></tr><tr><td>Other loads as defined in 4.10.2.2 to 4.10.2.5 and vertical loads due to ballast in ballast holds as defined in 4.10.3.1</td><td>$0.90\sigma_Y$ for static+dynamic load case
$0.72\sigma_Y$ for static load case</td></tr></table></td><td>Amendment (4)

Clarifies the allowable stress for vertical loads due to water ballast in ballast holds.</td></tr>
<tr><td>14.6.5.6 Buckling Strength of Steel Hatch Covers
7 The buckling strength of structural members is to be in accordance with the following formula:
$\eta_{act} \leq \eta_{all}$
Where:
η_{act}: Buckling utilisation factor based on applied stress, as defined in An1.3.2.2 and An4, Annex 14.6, and calculated per An5, Annex 14.6
η_{act}: Allowable buckling utilisation factor, as given in Table 14.6.5-3</td><td>14.6.5.6 Buckling strength of steel hatch covers
7 The buckling strength of structural members is to be in accordance with the following formula:
$\eta_{act} \leq \eta_{all}$
Where:
η_{act}: Buckling utilisation factor based on applied stress, as defined in An1.3.2.2 and An4, Annex 14.6, and calculated per An5, Annex 14.6
η_{act}: Allowable buckling utilisation factor, as given in Table 14.6.5-3</td><td></td></tr>
</table>

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr>
<td>
Table 14.6.5-3 Allowable Buckling Utilisation Factors
<table>
<tr><th>Structural component</th><th>Subject to</th><th>η_{all}, Allowable buckling utilisation factor</th></tr>
<tr><td rowspan="2">Plates and stiffeners
Web of PSM</td><td>External pressure, as defined in 4.10.2.1</td><td>0.80</td></tr>
<tr><td>Other loads, as defined in 4.10.2.2 to 4.10.2.5 and vertical loads due to ballast in ballast holds as defined in 4.10.3.1</td><td>0.90 for static+dynamic load case
0.72 for static load case</td></tr>
</table>
</td>
<td>
Table 14.6.5-3 Allowable Buckling Utilisation Factors
<table>
<tr><th>Structural component</th><th>Subject to</th><th>η_{all}, Allowable buckling utilisation factor</th></tr>
<tr><td rowspan="2">Plates and stiffeners
Web of PSM</td><td>External pressure, as defined in 4.10.2.1</td><td>0.80</td></tr>
<tr><td>Other loads, as defined in 4.10.2.2 to 4.10.2.5</td><td>0.90 for static+dynamic load case
0.72 for static load case</td></tr>
</table>
</td>
<td>Amendment (4)

Clarifies the allowable stress for vertical loads due to water ballast in ballast holds.</td>
</tr>
</table>

Amended	Original	Remarks
Appendix C2 DETAIL GUIDE FOR PREPARATION OF LOADING MANUAL	**Appendix C2 DETAIL GUIDE FOR PREPARATION OF LOADING MANUAL**	
1.2 Descriptive Example 1 of Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force (Ships without Longitudinal Bulkheads)	**1.2 Descriptive Example 1 of Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force (Ships without Longitudinal Bulkheads)**	
1.2.1 Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force The allowable values for vertical still water bending moment and vertical still water shear force of the ship in the maximum load condition and harbour condition are shown in the following **Table 1**, **Table 2** and **Fig. 2**.	**1.2.1 Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force** The allowable values for vertical still water bending moment and vertical still water shear force of the ship at sea and in port are shown in the following **Table 1**, **Table 2** and **Fig. 2**.	Amendment (6) Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the naming used for load scenarios in Part C.
1.3 Descriptive Example 2 of Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force (Ships with One to Four Rows of Longitudinal Bulkheads)	**1.3 Descriptive Example 2 of Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force (Ships with One to Four Rows of Longitudinal Bulkheads)**	
1.3.1 Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force The allowable values for vertical still water bending moment and vertical still water shear force of the ship in the maximum load condition and harbour condition are shown in the following **Table 3**, **Table 4** and **Fig. 3**.	**1.3.1 Allowable Values for Vertical Still Water Bending Moment and Vertical Still Water Shear Force** The allowable values for vertical still water bending moment and vertical still water shear force of the ship at sea and in port are shown in the following **Table 3**, **Table 4** and **Fig. 3**.	Amendment (6) Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the naming used for load scenarios in Part C.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks

Table 1 ~~For Conditions at Sea~~Maximum Load Condition

Point of output	Allowable value of vertical still water bending moment (*kN-m*)		Allowable value of vertical still water shear force (*kN*)	
	Positive	Negative	Positive	Negative

Amendment (6)
Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the naming used for load scenarios in Part C.

Table 2 ~~For Conditions in Port~~Harbour Condition

Point of output	Allowable value of vertical still water bending moment (*kN-m*)		Allowable value of vertical still water shear force (*kN*)	
	Positive	Negative	Positive	Negative
Note: The positive allowable value is shown in **Fig. 2**.				

Amendment (6)
Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the naming used for load scenarios in Part C.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks

Table 3 ~~For conditions at sea~~Maximum Load Condition

Point of output	Allowable value of vertical still water bending moment (*kN-m*)		Allowable value of vertical still water shear force (*kN*)		Allowable value of vertical still water shear force for longitudinal bulkhead (*kN*)	
	Positive	Negative	Positive	Negative	Positive	Negative

Amendment (6)
Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the namings of load scenarios in Part C.

Table 4 ~~For conditions in port~~Harbour Condition

Point of output	Allowable value of vertical still water bending moment (*kN-m*)		Allowable value of vertical still water shear force (*kN*)		Allowable value of vertical still water shear force for longitudinal bulkhead (*kN*)	
	Positive	Negative	Positive	Negative	Positive	Negative

Note:
The positive allowable value is shown in **Fig. 3**.

Amendment (6)
Clarifies some definitions and corrects typographical errors. Revises the wording to be consistent with the namings of load scenarios in Part C.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Part 2-2 BOX-SHAPED BULK CARRIERS **Chapter 9 FATIGUE** **9.2 Structural Details to be Assessed** **9.2.1 Structural Details to be Assessed by Finite Element Analysis** **9.2.1.1** **1** Critical structural details to be assessed for fatigue strength by finite element analysis according to **9.4, Part 1**, are shown in **Table 9.2.1-1**. **2** Notwithstanding the requirements specified in **-1**, where documents demonstrating sufficient fatigue strength are submitted and deemed appropriate by the Society, the fatigue strength assessment of the structure may be omitted.	**Part 2-2 BOX-SHAPED BULK CARRIERS** **Chapter 9 FATIGUE** **9.2 Structural Details to be Assessed** **9.2.1 Structural Details to be Assessed by Finite Element Analysis** **9.2.1.1** **1** Critical structural details to be assessed for fatigue strength by finite element analysis according to **9.4, Part 1**, are shown in **Table 9.2.1-1**. **2** Notwithstanding the requirements specified in **-1**, where documents demonstrating sufficient fatigue strength are submitted and deemed appropriate by the Society, the fatigue strength assessment of the structure may be omitted.	

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks

Table 9.2.1-1 Structural Details of Primary Members to be Assessed in the Hull Structure

No.	Critical structural details of hull structure
1	Intersections between inner longitudinal bulkhead and inner bottom plating (where no bilge hopper tanks are fitted)
2	Intersections between bilge hopper plating and inner bottom plating (where bilge hopper tanks are fitted)
3	Intersections between bilge hopper plating and inner longitudinal bulkhead (where bilge hopper tanks are fitted)
~~2~~4	Intersections between lower stool and inner bottom plating in way of bottom girder
~~3~~5	Hatch corner
~~4~~6	Intersections between inner bottom plating, bilge hopper plating, lower stool, and corrugated bulkhead
~~5~~7	Other areas with large stress concentration

Amendment (5)
Adds structural details to be assessed for fatigue strength by finite element analysis for box-shaped bulk carriers fitted with bilge hopper tanks.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Part 2-3 ORE CARRIERS **Chapter 2 GENERAL ARRANGEMENT DESIGN** **2.1 Structural Arrangements** **2.1.1 Double Bottoms** **2.1.1.1 General** **1** The height of double bottoms is to be determined so that the centre of gravity of the ship is not excessively low in full load condition. However, the height is not to be less than h (m) as specified in **2.4.1.1-1, Part 1**. **2** Floors are to be arranged at the positions of bulkheads or transverses in wing tanks or void spaces.	**Part 2-3 ORE CARRIERS** **Chapter 2 GENERAL ARRANGEMENT DESIGN** **2.1 Structural Arrangements** **2.1.1 Double Bottoms** **2.1.1.1 General** **1** The height of double bottoms is to be determined so that the centre of gravity of the ship is not excessively low in full load condition. However, the height is not to be less than h (m) as specified in **2.4.1.1-1 in Part 1**. **2** Floors or bottom transverses are to be arranged at the positions of bulkheads or transverses in wing tanks or void spaces.	Amendment (6) The wording "or bottom transverses" has been deleted as it is not necessary.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Part 2-9 SHIPS CARRYING LIQUEFIED GASES IN BULK (INDEPENDENT PRISMATIC TANKS TYPE A/B) **Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.4 Boundary Conditions and Load Conditions** **8.4.2 Load Conditions** **8.4.2.2 Method of Applying Moments to the Structural Model** In applying **8.5.2, Part 1**, the vertical bending moment and horizontal bending moment acting on the target hold are to be adjusted in accordance with the method specified in **8.4.2, Part 2-8**. However, M_{V-targ} and M_{H-targ} for the 30-degree static heel condition, the collision condition and the flooded condition are to be taken as the M_{V-T} and M_{H-T}, respectively, specified in **4.3.4.6, 4.3.5.5** and **4.3.6.5**.	**Part 2-9 SHIPS CARRYING LIQUEFIED GASES IN BULK (INDEPENDENT PRISMATIC TANKS TYPE A/B)** **Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.4 Boundary Conditions and Load Conditions** **8.4.2 Load Conditions** **8.4.2.2 Method of Applying Moments to the Structural Model** In applying **8.5.2, Part 1**, the vertical bending moment and horizontal bending moment act on the target hold are to be adjusted in accordance with the method specified in **8.4.2, Part 2-8**.	Amendment (6) Explicit specification of the reference to the adjustment moments to be considered in additional design load scenarios.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Part 2-10 SHIPS CARRYING LIQUEFIED GASES IN BULK (INDEPENDENT TANKS OF TYPE C) **Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.4 Boundary Conditions and Load Conditions** **8.4.2 Load Conditions** **8.4.2.2 Method of Applying Moments to the Structural Model** In applying **8.5.2, Part 1**, the vertical bending moment and horizontal bending moment acting on the target hold are to be adjusted in accordance with the method specified in **8.4.2, Part 2-8**. However, M_{V-targ} and M_{H-targ} for the 30-degree static heel condition, the collision condition and the flooded condition are to be taken as the M_{V-T} and M_{H-T}, respectively, specified in **4.3.4.6, 4.3.5.5** and **4.3.6.5, Part 2-9**.	**Part 2-10 SHIPS CARRYING LIQUEFIED GASES IN BULK (INDEPENDENT TANKS OF TYPE C)** **Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.4 Boundary Conditions and Load Conditions** **8.4.2 Load Conditions** **8.4.2.2 Method of Applying Moments to the Structural Model** In applying **8.5.2, Part 1**, the method of applying moments is to be in accordance with **8.4.2, Part 2-8.**	Amendment (6) Harmonisation of the wording with other Parts. Explicit specification of the reference to the adjustment moments to be considered in additional design load scenarios.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
Part 2-11 SHIPS CARRYING LIQUEFIED GASES IN BULK (MEMBRANE TANKS) **Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.4 Boundary Conditions and Load Conditions** **8.4.2 Load Conditions** **8.4.2.2 Method of Applying Moments to the Structural Model** In applying **8.5.2, Part 1**, the vertical bending moment and horizontal bending moment acting on the target hold are to be adjusted in accordance with the method specified in **8.4.2, Part 2-8**. However, M_{V-targ} and M_{H-targ} for the 30-degree static heel condition and the collision condition are to be taken as the M_{V-T} and M_{H-T}, respectively, specified in **4.3.4.6** and **4.3.5.5, Part 2-9**.	**Part 2-11 SHIPS CARRYING LIQUEFIED GASES IN BULK (MEMBRANE TANKS)** **Chapter 8 STRENGTH ASSESSMENT BY CARGO HOLD ANALYSIS** **8.4 Boundary Conditions and Load Conditions** **8.4.2 Load Conditions** **8.4.2.2 Method of Applying Moments to the Structural Model** In applying **8.5.2, Part 1**, the requirements specified in **Table 8.4.2, Part 2-8** are to be followed.	Amendment (6) Harmonisation of the wording with other Parts. Explicit specification of the reference to the adjustment moments to be considered in additional design load scenarios.

Amended-Original Requirements Comparison Table
(Amendment related to Part C of the Rules for Survey and Construction of Steel Ships (2026 Amendment 1))

Amended	Original	Remarks
EFFECTIVE DATE AND APPLICATION **1.** Effective date of this amendment is 1 July 2027. **2.** Notwithstanding the amendments, the current requirements apply to ships for which the date of contract for construction is before the effective date. **3.** Notwithstanding the provision of preceding **2.**, the amendments may apply to ships for which the date of contract for construction is before the effective date upon requests. **4.** For ships subject to Part C of the Rules for the Survey and Construction of Steel Ships and the Guidance for the Survey and Construction of Steel Ships prior to its comprehensive revision by Rule No.62 on 1 July 2022 and Notice No.47 on 1 July 2022 (herein after referred to as “old Part C of the Rules” and “old Part C of the Guidance”), and which the date of contract for construction* is on and after the effective date, this amendment also applies to following requirements. 20.2.5, Table C20.4 and Table C20.6, old Part C of the Rules		