RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part CSR-B&T Common Structural Rules for Bulk Carriers and Oil Tankers

Rules for the Survey and Construction of Steel Ships
Part CSR-B&T 2019 AMENDMENT NO.2

Rule No.103 27 December 2019
Resolved by Technical Committee on 22 July 2019

NIPPON KAIJI KYOKAI

Rule No.103 27 December 2019
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Rules for the survey and construction of steel ships" has been partly amended as follows:

Part CSR-B&T COMMON STRUCTURAL RULES FOR BULK CARRIERS AND OIL TANKERS

Part 1 GENERAL HULL REQUIREMENTS

Chapter 3 STRUCTURAL DESIGN PRINCIPLES

Section 1 MATERIALS

2. Hull Structural Steel

2.3 Steel Grades

Paragraph 2.3.1 has been amended as follows.

2.3.1

Materials in the various strength members are not to be of lower grade than those corresponding to the material classes and grades specified in **Table 3** to **Table ~~8~~7**. General requirements are given in **Table 3**, while additional minimum requirements for ships with length exceeding 150 *m* and 250 *m*, single side bulk carriers with length exceeding 150 *m* are given in **Table 4** to **Table 6**. The material grade requirements for hull members of each class depending on the thickness are defined in **Table ~~8~~7**.

Table 7 has been deleted, and Table 8 has been renumbered to Table 7 as follows.

~~Table 7 (Deleted)~~

Table ~~8~~7 Material Grade Requirements for Classes I, II and III
(Omitted)

Paragraph 2.3.2 has been amended as follows.

2.3.2

For strength members not mentioned in **Table 3** to **Table ~~7~~6**, Grade *A*/*AH* may be used upon agreement of the Society.

4. Aluminium Alloys

4.4 Material Factor, *k*

Paragraph 4.4.1 has been amended as follows.

4.4.1

The material factor, *k* for aluminium alloys is to be obtained from the following formula:

$$k = \frac{235}{R'_{\lim}}$$

where:

R'_{lim} : Minimum guaranteed yield stress of the parent metal in welded condition $R'_{p0.2}$, in N/mm^2, but not to be taken greater than 70% of the minimum guaranteed tensile strength of the parent metal in welded condition R'_m, in N/mm^2.

$R'_{p0.2}$: Minimum guaranteed yield stress, in N/mm^2, of material in welded condition.

$$R'_{p0.2} = \eta_1 R_{p0.2}$$

R'_m : Minimum guaranteed tensile strength, in N/mm^2, of material in welded condition.

$$R'_m = \eta_2 R_m$$

$R_{p0.2}$: Minimum guaranteed yield stress, in N/mm^2, of the parent metal in delivery condition.

R_m : Minimum guaranteed tensile strength, in N/mm^2, of the parent metal in delivery condition.

η_1, η_2 : Specified in **Table ~~9~~8**.

Table 9 has been amended as follows.

Table ~~9~~8 Aluminium Alloys - Coefficients for Welded Construction

Aluminium alloy	η_1	η_2
Alloys without work-hardening treatment (series 5000 in annealed condition *O* or annealed flattened condition *H*111)	1	1
Alloys hardened by work hardening (series 5000 other than condition *O* or *H*111)	$R'_{p0.2} / R_{p0.2}$	R'_m / R_m
Alloys hardened by heat treatment (series 6000) (1)	$R'_{p0.2} / R_{p0.2}$	0.6
(1) When no information is available, coefficient η_1 is to be taken equal to the metallurgical efficiency coefficient β as defined in **Table ~~10~~9**.		

Table 10 has been renumbered to Table 9 as follows.

Table ~~10~~9 Aluminium Alloys - Metallurgical Efficiency Coefficient β
(Omitted)

Chapter 6 HULL LOCAL SCANTLING

Section 4 PLATING

2. Special Requirements

2.2 Bilge Plating

Paragraph 2.2.3 has been deleted, and Paragraphs 2.2.4 and 2.2.5 have been renumbered to Paragraphs 2.2.3 and 2.2.4 as follows.

~~2.2.3 (deleted)~~
~~2.2.4~~2.2.3 Transverse extension of bilge minimum plate thickness

Where a plate seam is located in the straight plate just below the lowest stiffener on the side shell, any increased thickness required for the bilge plating does not have to be extended to the adjacent plate above the bilge provided the plate seam is not more than $s_2/4$ below the lowest side longitudinal. Similarly, for the flat part of adjacent bottom plating, any increased thickness for the bilge plating does not have to be extended to the adjacent plate provided that the plate seam is not more than $s_1/4$ beyond the outboard bottom longitudinal. For definition of s_1 and s_2, see **Fig. 1**.

~~2.2.5~~2.2.4 Hull envelope framing in bilge area

For transversely stiffened bilge plating, a longitudinal is to be fitted at the bottom and at the side close to the position where the curvature of the bilge plate starts. The scantling of those longitudinals are to be not less than the one of the closer adjacent stiffener. The distance between the lower turn of bilge and the outermost bottom longitudinal, Δs_1, is generally not to be greater than one-third of the spacing between the two outermost bottom longitudinals, s_1. Similarly, the distance between the upper turn of the bilge and the lowest side longitudinal, Δs_2, is generally not to be greater than one-third of the spacing between the two lowest side longitudinals, s_2. See **Fig. 1**.

Chapter 7 DIRECT STRENGTH ANALYSIS

Section 3 LOCAL STRUCTURAL STRENGTH ANALYSIS

4. Structural Modelling

4.5 Transverse Web Frames

Fig. 1 has been amended as follows.

Fig. ~~1~~11 Example of Extent of Local Model for Fine Mesh Analysis of Web Frame Bracket Connections and Openings
(Omitted)

Chapter 9 FATIGUE

Section 1 GENERAL CONSIDERATIONS

1. Rule Application for Fatigue Requirements

1.1 Scope

Paragraph 1.1.8 has been deleted.

~~1.1.8 Special consideration for the application of the Rules~~

~~Notwithstanding the provisions in this chapter, relevant rule changes adopted by *IACS* may be applicable from their effective dates.~~

Chapter 11 SUPERSTRUCTURES, DECKHOUSES AND HULL OUTFITTING

Section 3 EQUIPMENT

3. Anchoring Equipment

3.3 High and Super High Holding Power Anchors

Paragraph 3.3.3 has been amended as follows.

3.3.3 Application

High holding power anchors are to be of a design that will ensure that the anchors will take effective hold of the sea bed without undue delay and will remain stable, for holding forces up to those required by ~~**3.3.4**~~ <u>the Society</u>, irrespective of the angle or position at which they first settle on the sea bed when dropped from a normal type of hawse pipe. A demonstration of these abilities may be required.

The design approval of high holding power anchors may be given as a general/type approval, and listed in a published document by the Society.

Chapter 12 CONSTRUCTION

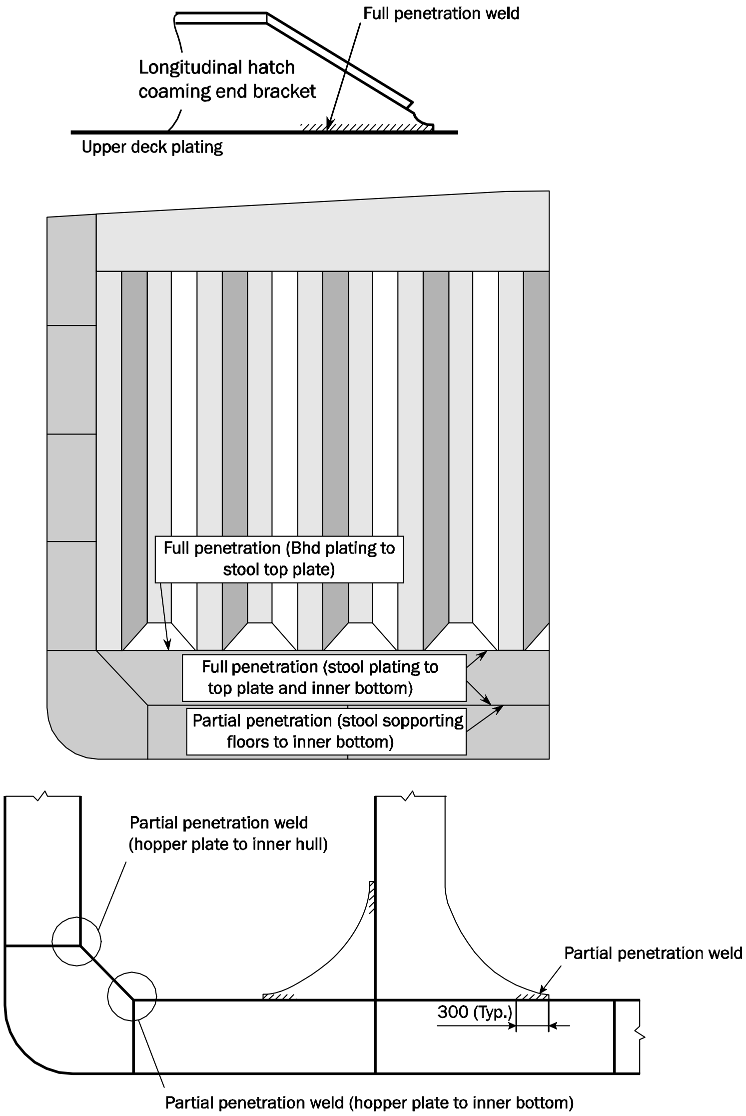
Section 3 DESIGN OF WELD JOINTS

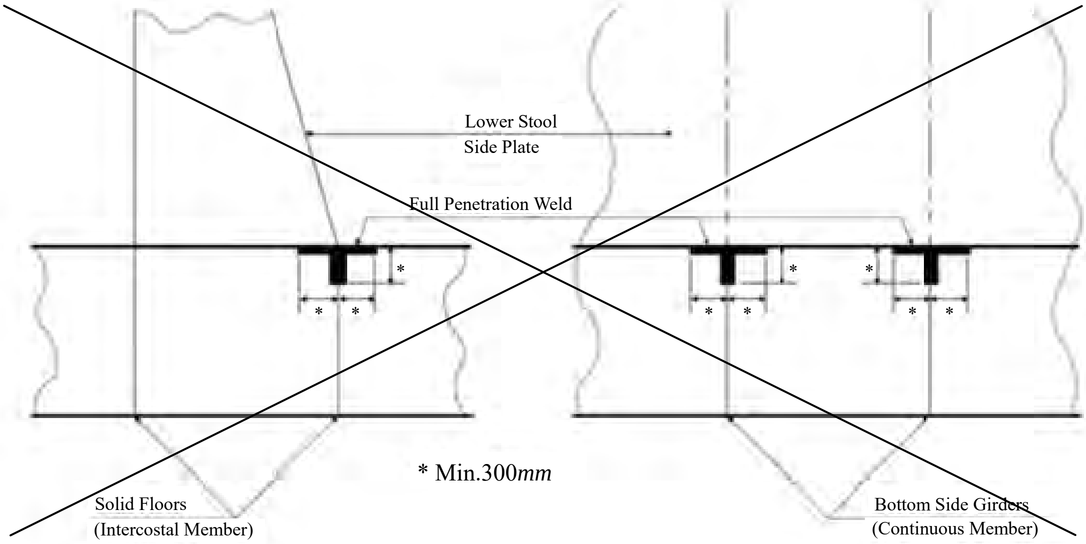
2. Tee or Cross Joint

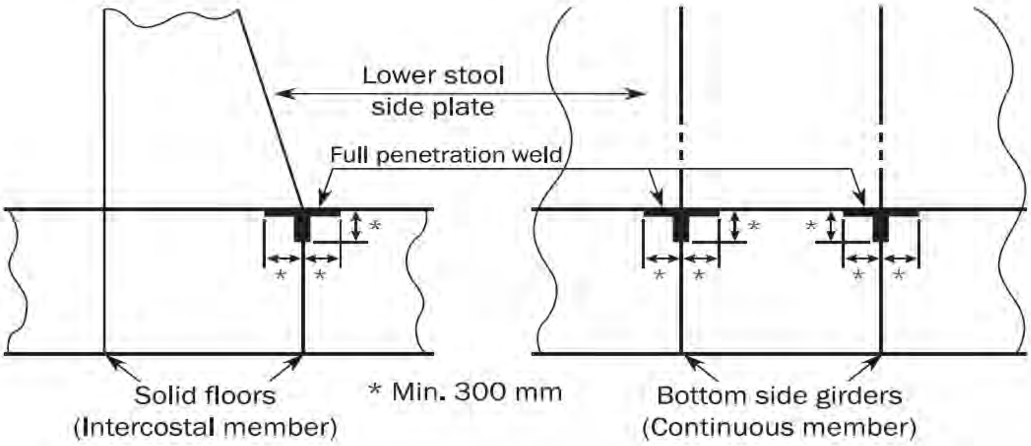
2.4 Partial or Full Penetration Welds

Fig. 3 has been amended as follows.

Fig. 3 High Stress Areas Welding (examples)







EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 27 December 2019.