

Singapore National Annex to Eurocode 3: Design of steel structures

– Part 1-1: General rules and rules for buildings

AMENDMENT NO. 1

May 2019

1. Page 5, Contents

Add the following:

Tables

Table NA.1 – Selection of buckling curve for a cross-section

Table NA.2 – Suggested limits for vertical deflections

Table NA.3 – Suggested limits for horizontal deflections

Table NA.4 – Scope and conditions of application of execution class

2. Page 6, National Foreword, Paragraph 2

Replace “adoption” with “modified adoption”.

Replace “BC 1:2008” with “BC 1:2012”.

Add “and Eurocode 3” after BS 5950.

3. Page 7, NA.1, Scope, item a)

Add “– C.2.2(3)” and “– C.2.2(4)” after BB.1.3(3)B.

4. Page 7, NA.2.1, General

Replace “NA.2.26” with “NA.2.27”.

5. Page 7, NA.2.3, Paragraph 1

Replace “BC 1:2008” with “BC 1:2012”.

6. Page 8, NA.2.4, Material properties

Replace “BC 1:2008” with “BC 1:2012”.

7. Page 9, NA.2.11, Design values of initial local bow imperfection

Replace entire text with the following:

Recommended values given in Table 5.1 of SS EN 1993-1-1 should be used.

For elastic analysis of the cross-section, the initial imperfections for an individual section is about a particular axis may be back-calculated from the formula for the buckling curves given in SS EN 1993-1-1:2010+A1:2019, 6.3 using the elastic section modulus.

For plastic analysis of the cross-section, the initial imperfections for an individual section about a particular axis may be back-calculated from the formula for the buckling curves given in SS EN 1993-1-1:2010+A1:2019, 6.3 using the full plastic section modulus.

8. Page 10, NA.2.17 Lateral torsional buckling for rolled sections or equivalent welded sections, item b)

Replace the sentence before the table with “SS EN 1993-1-1:2010+A1:2019, Table 6.5 should be replaced with Table NA.1.”

Add table title “Table NA.1 Selection of buckling curve for a cross-section”.

9. Page 11, NA.2.23, Vertical deflections

Replace “The following table” with “Table NA.2”.

Add table title “Table NA.2 Suggested limits for vertical deflections”.

10. Page 12, NA.2.24, Horizontal deflections

Replace “The following table” with “Table NA.3”.

Add table title “Table NA.3 Suggested limits for horizontal deflections”.

11. Page 12, Addition of a new clause

Add the following new clause NA.2.27 and Table NA.4 after NA.2.26:

**NA.2.27 Selection of execution class
[SS EN 1993-1-1:2010+A1:2019, C.2.2(3) and C.2.2(4)]**

NA.2.27.1 General

SS EN 1993-1-1:2010+A1:2019, Table C.1 should not be adopted.

Decisions for the selection of reliability class and consequences class are given in clause NA.2.27.2.

Decisions for the selection of execution class (EXC) are given in clause NA.2.27.3.

NA.2.27.2 Selection of reliability class and consequences class

If the application of design rules in a particular part of SS EN 1993 is specified in terms of reliability class (RC) or consequences class (CC), such classes should apply.

Otherwise it should be assumed that the design rules in SS EN 1993 are safe for classes up to and including RC2 and CC2, as defined in SS EN 1990.

NA.2.27.3 Selection of execution class

Execution class should be selected taking into account the parts of SS EN 1993 and other Eurocodes that are applicable to the design of the structure.

The selection of execution class is given in Table NA.4.

NOTE 1 In order to ensure full compatibility with the design resistance values in SS EN 1993, technical requirements in SS EN 1090-2 relating to certain execution classes might need to be enhanced. Guidance is given in PD 6705-2 for designs to SS EN 1993-2. Subject to the limitations in its scope of materials and processes, PD 6705-2 might also be used to provide guidance for other designs covered by Table NA.4.

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If SS EN 1998 applies to a design, Quantified Service Categories F71, F90 and F112 might be deemed to apply to yielding/dissipative elements with ductility classes DCL, DCM and DCH respectively.

Table NA.4 – Scope and conditions of application of execution class

Parts of SS EN 1993 which are applicable to the design of the structure ⁽¹⁾		All relevant Parts except Part 1-9 or Part 1-12	All relevant Parts including Part 1-9 and/or Part 1-12	
Other Eurocodes applicable to the design of the structure ⁽¹⁾ (in addition to SS EN 1990 and SS EN 1991)	Required	-	-	SS EN 1998
	Optional	SS EN 1994	SS EN 1994	SS EN 1994
Execution classes	RC1, CC1, RC2, CC2	Minimum EXC2	Generally EXC3	Generally EXC3
	RC3, CC3	EXC3	Minimum EXC3	Minimum EXC3
<p>Note:</p> <p>⁽¹⁾ Or a distinct, clearly identifiable zone of a structure</p>				

No guidance on the scope of application of EXC1 is given. The scope of application of EXC1 in the NOTE to SS EN 1993-1-1:2010+A1:2019, C.2.2(4) is not endorsed for general use.

NOTE 2 – The use of EXC1 generally provides a lower level of assurance of attaining the design resistance values in SS EN 1993. If the proposed specification of EXC1 by a specifier, either in full or in part, does not take this into account, its use might result in a higher probability of structural failure than is normally accepted for most structures in Singapore.

12. Page 14, Bibliography

Add the following publications:

SS EN 1090-2, Execution of steel structures and aluminium structures – Part 2: Technical requirements for the execution of steel structures

SS EN 1990, Eurocode – Basis of structural design

SS EN 1991, Eurocode 1: Actions on structures

SS EN 1993-1-9, Eurocode 3: Design of steel structures – Part 1-9: Fatigue

SS EN 1994, Eurocode 4: Design of composite steel and concrete structures

SS EN 1998, Eurocode 8: Design of structures for earthquake resistance

PD 6705-2. Published Document. Structural use of steel and aluminium. Part 2: Recommendations for the execution of steel bridges to SS EN 1090-2.