Template for comments and secretariat observations

Date: 2015-01-16	Document:	Project: **EN 1993-1-1**

MB/ NC[1]	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment[2]	Comments	Proposed change	Observations of the secretariat
Do any clauses require editorial or technical correction?							
DE		5.2.1		te	In house structures without any wind or earthquake loading (even if not sensible for stability) may need a horizontal stabilization in order to be robust against unplanned horizontal drifts.	Add a new sub clause (7) at the end "For frames without any relevant horizontal forces from external loading where first order analysis is allowed, see Eq. 5.1, a minimum of horizontal forces equivalent to a sway imperfection according to 5.3.2 (3) a) should be considered."	**2**
DE				general	All symbols should be checked to avoid double definitions.	–	**1**
DE		6.3		editorial	We would recommend to change the structure of the chapter to get a better readability and to ease the use. All regulations for a special stability case should be consolidated in a subclause in order of the complexity, starting with demarcation criteria and simplified rules. Chapter 6.3.5 should be reduced to constructional rules, see comments to BB.3 and 6.3.5.	Proposal: 6.3.1 Uniform members in compression 6.3.1.1 Demarcation criteria and simplified rules for buckling resistance 6.3.1.2 Buckling curves 6.3.2 Uniform members in bending 6.3.2.1 Demarcation criteria and simplified rules 6.3.2.2 Lateral torsional buckling curves 6.3.3 Interaction formula for members in bending and compression	**1**

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						6.3.4 General method	
DE		6.3.1		technical	It's recommended to add a chapter in front: 6.3.0 General with general notes according to different types of stability check. According to the new chapter the numbers have to be adjusted.		**1**
DE		6.3.1.		editorial	See above We would recommend to add general notes for a stability check according to second order theory.	Consider to add paragraph: (1) The buckling verification of members may be carried out by using the rules according to 6.3.1 – 6.3.4 or alternatively by verification according to 6.2 based on internal forces calculated according to second order theory, see 5.2.2 assuming appropriate imperfections according to 5.3. Note: No buckling verifications is necessary if equation (5.1) applies. (2) Members subjected to compression and bending should be checked according to 6.3.3 or 6.3.4.	**2** **(Not only editorial)**
DE		6.3.1.1	(3)	editorial	According to our recommendation to 6.2.2 Table 6.7 should be moved from the end of clause 6.3 to the beginning of 6.2.2. This can help to reduce also in 6.3.	Consider to delete equation (6.48) and include the necessary information for class 4 cross-sections by referring to Table 6.7 in the beginning of 6.2.2.1.	**1**
DE		6.3.1.1	(3) NOTE	editorial	The note is no longer necessary; see comment to 6.3.1 if a general remark on alternative verification according to second order theory is given in the beginning.	Consider to delete the note.	**1**

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DE		6.3.1.1	(4)	editorial	The clause is not more necessary at this position, see comment to 6.2.	Consider to delete the clause.	**1**
DE		6.3.1.2		editorial	We would recommend to change the structure of the subchapter to get a better readability and to ease the use. Some equations could be deleted.	Proposal: - Buckling curves - Non-dimensional slenderness Consider to replace the equations for $\bar{\lambda}$ by referring to 6.3.1.3 and 6.3.1.4.	**1**
DE		6.3.1.2	(2)	editorial	The imperfection factor α is only defined in Table 6.1.	Consider to replace by: “The imperfection factor α corresponding to the appropriate buckling curve, see Table 6.2, should be obtained from Table 6.1”.	**1**
DE		6.3.1.2	(3)	editorial	The hint is not normative necessary.	Consider to replace by: “Buckling curves are given in Figure 6.4.”	**1**
DE		6.3.1.2	(4)	technical	The second criterion is partly in conflict with regulations in 5.2.1.	Consider to delete this paragraph.	**4**
DE		6.3.1.4	(2)	editorial	See comment on 6.3.1.1 (3).		**1**
DE		BB.3		technical editorial	The stable length method is mainly used at UK only so that in the sense of reducing the number of alternative verifications it is recommended to move the content to a Technical Specification Also the criterions lead to slightly different results as the demarcation criterion in 6.3.2.1.	Consider to move the stable length method from the code to a Technical Specification.	**2**
DE		6.3.2.2	(2)	editorial	The indication that boundary and loading	Consider to delete these indications.	**4**

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					conditions are taken into account, is unnecessary.		
DE		6.3.3	(1)	editorial	The explanations have to be clarified.	Consider to slightly change the clause. e. g.: "… members with hollow sections".	**1**
DE		6.3.3	(4)	editorial technical	See comment on 6.3.1.1 (3). The Method according to Annex B has been developed further and meanwhile includes a wider scope. It should therefore be considered to be moved to the main text. In order to reduce the number of alternative verifications, it may be considered for Method A to be moved to a Technical Specification where reference can be given in EN 1993-1-1 so that those who have been using Method A can apply it without any restriction.	Add a cross-reference to Tab. 6.2.	**1** (current table 6.7) **2**
DE		6.3.3	(5) NOTE 1	editorial	The clauses are not normative necessary.	Consider to delete the clause in case of including Annex B in the basic document.	**1**
DE		6.3.3	NOTE 3	editorial	The clauses are not normative necessary.	Consider to delete the note.	**2**
DE		6.3.4	(1)	technical	The clause should be clarified.	The following ... may be used alternatively to the methods given in 6.3.1, 6.3.2 and 6.3.3 or where these methods do not apply.	**4**
DE		6.3.4	(2)	editorial	The format of eq. (6.63) differs from the general scheme. Also it has to be clarified which cross-section	Consider to change the equation.	**1** **4**

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					interaction can be used.	$\frac{1}{\frac{\chi_{op}\,\alpha_{ult,k}}{\gamma_{M1}}} \leq 1,0$	
DE		6.3.4	(4)	technical	Clarify the application. The German NA restricts to the rule as given.	The reduction factor χ according to 6.3.1 for χ_{op} has to be used for axial forces and χ_{LT} according to 6.3.2.2 for χ_{op} for bending moments. If both forces are present the smaller value of χ and χ_{LT} for the determination of χ_{op} has to be used.	**4** **See also SE29**
					The format of eq. (6.65) differs from the general scheme.	Consider to change the equation (6.65). $\frac{N_{Ed}}{\frac{\chi_{op} N_{Rk}}{\gamma_{M1}}} + \frac{M_{y,Ed}}{\frac{\chi_{op}\, M_{y,Rk}}{\gamma_{M1}}} \leq 1$	**1**
DE		6.3.5.2	(2)B	editorial	The clause can be reduced to the constructional notes, see comment on Annex BB.3.	Consider to move the stable length method from the code to a Technical Specification. Chapter 6.3.5.1 and 6.3.5.2 should be revised; also the Figures 6.5 and 6.6 can be gathered. Chapter 6.3.5.3 should be reduced to a reference to the Technical Specification dealing with the stable length method.	**2** **1** **2**
DE		6.4		editorial	We would recommend to change the structure of the chapter to get a better readability and to ease the use.	Proposed structure: 6.4 Uniform built-up compression members 6.4.1 General	**1**

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						6.4.2 Design forces for components 6.4.3 Resistance of components of laced compression members 6.4.4 Resistance of components of battened compression members 6.4.5 Constructional details 6.4.6 Closely spaced built-up members	
DE		6.4.1 (2)	NOTE	editorial	This is textbook knowledge and could be deleted.	Consider to delete the note.	**4**
DE		6.4.1	(6)	technical	The influence of shear stiffness on the critical force of a built-up member should be clarified.	Consider to change equation (6.69). $M_{Ed} = \frac{N_{Ed} \cdot e_0 + M_{Ed}^I}{1 - \frac{N_{Ed}}{N_{cr}}}$ $N_{cr} = \frac{1}{\frac{L^2}{\pi^2 EI_{eff}} + \frac{1}{S_v}}$	**1**
DE		6.4.1	(7)	technical	For eq. (6.70) shear forces caused by bending moment should be included.	Consider to change equation (6.70). $V_{Ed} = V_{Ed}^I + \frac{\pi}{L}(M_{Ed} - M_{Ed}^I)$ V_{Ed}^I is the design value of the maximum shear force in the built-up member without second order effects	**2**
DE		6.4.2.2	all	editorial	It would be favorable to get the	We propose to merge the details in a new	**1**

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		6.4.3.2			constructional details for both types of built-up members in only one clause.	subclause: 6.4.5 Constructional details and to delete fig. 6.10.	**(merge figures and not delete)**
DE		7.2.1 7.2.2 7.2.3	all	editorial	In all these clauses are more or less only references to EN 1990. This could be done in only a general clause with declarations for the deformations and dynamic effects.	We propose to merge these clauses in a general clause 7.2 Serviceability limit states for buildings.	**1**
Which clauses would benefit from improvements in clarity?							
DE		5.3.2	(3) b)	te	Combine 5.3.2. (3)b with (6) for clarification	"The bow imperfection should only be taken into account in addition to the sway imperfection according to (3)a) if Equation (5.8) applies." Subclause (6) can then be deleted. Please check in addition the consistency to subclause 5.2.2(7).	**4**
DE		5.3.2	(5) Fig. 5.3	te	In Figure 5.3 there is the angle $\phi/2$ and ϕ, in figure 5.7 there is ϕ.	Clarify the difference between Figure 5.3 and 5.7 and try to summarise both figures.	**4**
DE		5.3.2	(11) Formula (5.10)	te	Consider report *ECCS-TC8-2010-06-001* (Sedlacek, G.: Consistency of the equivalent geometric imperfection used in design and in the tolerances for geometric imperfection used in execution, Febr. 2010)	Term $\frac{\chi \bar{\lambda}^2}{\gamma_{M1}}$ in the numerator could be deleted.	**6**
DE		5.3.2	(11)	ed	Wording of this paragraph is not very clearly.	Clarification of paragraph (11) is needed.	**6**
DE		5.3.4	(3)	te	Subclause is partly unsafe and not valid.	Add table 5.3.4(3) (see below).	**2**
DE		5.5.2	(3)	te	It depends also on the stress distribution.	Add: "and the stress distribution".	**1 (+ fy!)**
DE		5.5.2	(5) to (7)	ed	Paragraphs are confusing.	Could be summarized in one paragraph.	**1**
DE		6.2.1	(5) Equation (6.1)	ed	Equation (6.1) may be simplified for easier use	Replace f_{yd} by $f_y/\gamma_{M0.}$	**1**

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DE		6.2.1	(5)	te	Differentiate γ_M for cases of first or second order analysis	Add: $\frac{\sigma_V}{f_y/\gamma_M} \le 1{,}0$ For plane stress state the v. Mises stress σ_V may be determined as follows: $\sigma_v = \sqrt{\sigma_{x,Ed}^2 + \sigma_{z,Ed}^2 - \sigma_{x,Ed} \cdot \sigma_{z,Ed} + 3\tau_{Ed}^2}$ $\gamma_M = \gamma_{M0} = 1{,}0$ in normal cases $\gamma_M = \gamma_{M1} = 1{,}1$ in cases of second-order analysis If there is a three-dimensional stress state, add the influence of σ_y , accordingly.	**1** **2** **(skip the values of γ_M)**
DE		6.2.1	(9)	ed	There is no *elastic distribution* of strains.	Replace *elastic* by *linear*. ("… its resistance should be based on a *linear* distribution of strains ...")	**1**
DE		6.2.2		ed	For ease of use add table of cross section values in 6.2.2. This allows shortening a number of double equations for different classes in the following clauses	Move Table 6.7 from the end of clause 6.3 to the beginning of clause 6.2.2 to paragraph 6.2.2.1 Amended table „Cross-sections values for class 1 to 4", see below.	**1**
DE		6.2.2.2	(1)	te	Definition for net area A_{net} is missing.	Add a formula for A_{net}.	**2**
DE		6.2.3		ed	Concentrate rules for member verification in EN 1993-1-1.	Move rules for angle profiles with bolted holes from EN 1993-1-8, Clause 3.10.3. to EN 1993-1-1.	**2**
DE		6.2.4	(2)	ed		Could be shortened by inserting table „Cross-sections values for class 1 to 4" in paragraph 6.2.2.1.	**1**
DE		6.2.5	(2)	ed		Could be shortened by inserting table „Cross-sections values for class 1 to 4" in paragraph 6.2.2.1.	**1**
DE		6.2.7		te	This subclause should be generally revised while		**6**

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					retaining simplification according to (7).		
DE		6.2.8	(2)-(4)	te	The reduction ρ for the shear force has been derived empirically on rolled sections. For other sections e.g. T-section the factor should better follow the criterion of equation (6.1).	Add a note: Note: Rules (2) to (4) apply for I-sections and box girders. Add: (5) For T-section and similar a reduction ρ=(1- square(1-(V/V_{pl})^2)) should be assumed for V > 0,33 V_{pl}	**2**
DE		6.2.8	(5) Equation (6.30)	te	In formula (6.30) shear area is not correctly taken into account.	Check Equation (6.30) – a proper consideration of the shear area is important. For conservative results replace A_w by A_v.	**6**
DE		6.2.9.1		te	This subclause should be generally revised while retaining the existing ease of use.		**4**
DE		6.2.9.1	(2) Equation (6.31)	ed	Consistent presentation of cross-section checks is necessary.	Harmonize the formats. $\frac{M_{\mathrm{Ed}}}{M_{\mathrm{N,Rd}}} \le 1{,}0$	**1**
DE		6.2.9.1	(4)	ed	Applicable sections should be clarified.		**4**
DE		6.2.10		te	The reduction *ρ* for the shear force has been derived empirically on rolled sections. For other sections e.g. T-section the factor should better follow the criterion of equation (6.1).	See proposed change for 6.2.8(2)-(4)	**2**
Where should the scope of the EN be extended?							
Where could the EN by shortened?							

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DE		5.3.2	(10)	ed	Textbook knowledge, for a clear short code not necessary.	Could be deleted.	**2**
DE		5.3.3	(2)	ed	For a clear short code not necessary.	Could be deleted.	**4**
DE		5.3.3	(3)	ed	For a clear short code not necessary.	Delete, but Figure 5.6 should be presented in (1)	**4**
DE		5.6	(5)	ed	For a clear short code not necessary.	Could be deleted.	**4**
DE		6.2.9.1	(3)	ed	It is an exception. For a clear short code not necessary.	Delete, also Equation (6.32)	**4**
DE				general	First chapters in the beginning which are repeated in every Eurocode part should be presented only once in EN 1990.	Remove chapters “Background to the Eurocode programme”, “Status and field of application of Eurocodes”, “National standards implementing Eurocodes” and “Links between Eurocodes and harmonised technical specifications (ENs and ETAs) for products”, which should be presented only in EN 1990.	**3** **Because this is a decision to be made at a higher level (TC250)**
Are there any clauses whose application leads to uneconomic construction?							
Are there any clauses whose application necessitates excessive design effort?							

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Table belongs to 5.3.4(3): initial local bow imperfection e_0 / L **2**

Cross-section	Limits	Elastic verification e_0/ L	Plastic verification e_0 / L
rolled I-sections	h/b ≤ 2,0	1/500	1/400
	h/b > 2,0	1/400	1/300
welded I-sections	h/b ≤ 2,0	1/400	1/300
	h/b > 2,0	1/300	1/200

Table belongs to 6.2.2.1: Cross-sections values for class 1 to 4 **2**

Class	1	2	3	4
A_i	A	A	A	A_{eff}
$W_{i,y}$	$W_{pl,y}$	$W_{pl,y}$	$W_{el,y}$	$W_{eff,y}$
$W_{i,z}$	$W_{pl,z}$	$W_{pl,z}$	$W_{el,z}$	$W_{eff,z}$

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