Document: CEN/TC 250 N 1174

EUROPEAN COMMITTEE FOR STANDARDIZATION COMITTE EUROPEEN DE NORMALISATION EUROPAISCHES KOMITEE FUR NORMUNG

Date: 4 November 2014

To the Members of CEN/TC 250
Structural Eurocodes

Secretariat of CEN/TC 250
Direct tel: +44 (0)20 8996 7421
Direct fax: +44 (0)20 8996 7799
E-mail: e-mail: tracey.wilkins@bsigroup.com
Web: www.bsigroup.com

Dear Member

Please find enclosed comments received during the systematic review of:

- EN 1993-1-1:2005 Eurocode 3. Design of steel structures. General rules and rules for buildings

Yours sincerely

Tracey Wilkins
Secretary to CEN/TC 250

Result of voting

Ballot Information:

Ballot reference:	Review of EN 1993-1-1:2005
Ballot type:	CENCIB
Ballot title:	EN 1993-1-1:2005 [AC:2005 + AC:2006 + AC:2009] *Eurocode 3 - Design of steel structures - General rules and rules for buildings*
Opening date:	2014-03-31
Closing date:	2014-09-30
Note:	

Member responses:

Votes cast (20)	Austria (ASI) Belgium (NBN) Croatia (HZN) Czech Republic (UNMZ) Denmark (DS) Finland (SFS) France (AFNOR) Germany (DIN) Greece (NQIS ELOT) Ireland (NSAI) Italy (UNI) Lithuania (LST) Netherlands (NEN) Norway (SN) Poland (PKN) Romania (ASRO) Slovenia (SIST) Spain (AENOR) Sweden (SIS) United Kingdom (BSI)
Comments submitted (0)	
Votes not cast (13)	Bulgaria (BDS) Cyprus (CYS) Estonia (EVS) Hungary (MSZT) Iceland (IST) Latvia (LVS) Luxembourg (ILNAS) Malta (MCCAA) Portugal (IPQ) Slovakia (SOSMT) Switzerland (SNV) The Former Yugoslav Republic of Macedonia (ISRM) Turkey (TSE)

Questions:

Q.1	"Please consider and respond to the following 6 questions using the generic comment template provided. 1. Do any clauses require editorial or technical correction? 2. Which clauses would benefit from improvements in clarity? 3. Where should the scope of the EN be extended? 4. Where could the EN by shortened? 5. Are there any clauses whose application leads to uneconomic construction? 6. Are there any clauses whose application necessitates excessive design effort? "

Votes by members	Q.1
Austria (ASI)	Abstain
Belgium (NBN)	Yes
Croatia (HZN)	Abstain
Czech Republic (UNMZ)	Yes
Denmark (DS)	Yes
Finland (SFS)	Yes
France (AFNOR)	Yes
Germany (DIN)	Yes
Greece (NQIS ELOT)	Yes
Ireland (NSAI)	Abstain
Italy (UNI)	Abstain
Lithuania (LST)	Abstain
Netherlands (NEN)	Abstain
Norway (SN)	Yes
Poland (PKN)	Yes
Romania (ASRO)	Yes
Slovenia (SIST)	Abstain
Spain (AENOR)	Yes
Sweden (SIS)	Yes
United Kingdom (BSI)	Yes

Answers to Q.1: "Please consider and respond to the following 6 questions using the generic comment template provided. 1. Do any clauses require editorial or technical correction? 2. Which clauses would benefit from improvements in clarity? 3. Where should the scope of the EN be extended? 4. Where could the EN by shortened? 5. Are there any clauses whose application leads to uneconomic construction? 6. Are there any clauses whose application necessitates excessive design effort? "		
13 x	**Yes**	**Belgium (NBN)** **Czech Republic (UNMZ)** **Denmark (DS)** **Finland (SFS)** **France (AFNOR)** **Germany (DIN)** **Greece (NQIS ELOT)** **Norway (SN)** **Poland (PKN)** **Romania (ASRO)** **Spain (AENOR)** **Sweden (SIS)** **United Kingdom (BSI)**
0 x	**No**	
7 x	**Abstain**	**Austria (ASI)** **Croatia (HZN)** **Ireland (NSAI)** **Italy (UNI)** **Lithuania (LST)** **Netherlands (NEN)** **Slovenia (SIST)**

Template for comments and secretariat observations

Date: 2014-10-17	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
					KEY TO COMMENTATORS ES Aenor (Spain) FR Afnor (France) RO ASRO (Romania) GB BSI (UK) DE DIN (Germany) DS/DK DS (Denmark) BE NBN (Belgium) GR NQIS ELOT (Greece) PL PKN (Poland) FI SFS (Finland) SE SIS (Sweden) NO SN (Norway) CZ UNMZ (Czech Republic)		
Do any clauses require editorial or technical correction?							
ES1					We support the revision of Eurocodes mentioned in N 1083 (Eurocode 3). Comments are submitted as requested by WGs and SC3.".		No comment
FR1		5.2.1	(4)B	te	In the expression of α_{cr}, the definition of H_{Ed} as the design horizontal load can lead to errors strongly on the unsafe side, in case of uniformly distributed horizontal loads on the columns. Add details on the field of application of the expression: "Plane structures composed of	Define : $\alpha_{cr} = K\, h / V_{Ed}$ Where: K is the lateral rigidity of the storey. This rigidity may be calculated from a linear elastic analysis using the following expression:	

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2 **Type of comment:** **ge** = general **te** = technical **ed** = editorial

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					vertical columns and horizontal beams”	$K = H_f / \delta_f$ H_f is a fictitious horizontal load applied at the top of the columns of the storey; δ_f is the horizontal displacement at the top of the storey, relative to the bottom of the storey; V_{Ed} is the total vertical load at the bottom of the storey ; h is the storey height.	2
FR2		5.2.1	(4) NOTE 2B	te	The expression (5.3) is quite complicated while an equivalent and simpler condition can be given.	Replace expression (5.3) by: $N_{Ed}/N_{cr} > 0,1$	2
FR3		5.2.2	(8)	te	Give details about the field of application of the method.	In the beginning, add: “For frames sensitive to buckling in a sway mode, where the stability of the frame is assessed by…”.	3, Equivalent column method is also applicable to non-sway frames.But the wording of the paragraph should be clarified.
FR4		5.3.2	(3)	te + ed	The beginning of the clause « For frames sensitive to buckling in a sway mode…” can lead to the interpretation that it is not necessary to include global and local imperfections in braced frames or frames that fulfil the criterion (5.1).	Replace the beginning of the clause by : “Except when the clause 5.2.2(8) is applied for a frame sensitive to buckling in a sway mode...”	2
FR5		5.3.4	(3)	te	A second order analysis including a simple lateral imperfection for lateral torsional buckling is not conservative in comparison with a member imperfection derived from the first buckling mode (i.e. including torsional imperfection). This method is rarely applied in practice and requires additional information like: - warping should be included in the analysis; - the effects of the position of the transverse loads / shear centre should be included in the analysis.	Proposition : Remove 5.3.4 (3) and add a note: "The member imperfection as defined above does not cover the effects of lateral torsional buckling."	6
FR6		5.5.2	Table 5.2	ed	In the sheets 1 and 2, the title of the column dealing with bending and axial force is not correct since it is not only bending and compression, but	Replace « Part subject to bending and compression » by « Part subject to bending and axial force »	1

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					also bending and tension.		
FR7		5.5.2	Tableau 5.2	te	Sheet 1: inconsistency for internal walls between the classification limits and the reduction factor for Class 4 according to EN 1993-1-5. As an example: in pure compression (with ε = 1,0), for c/t = 38,5 (class 3), the reduction factor is lower than 1,0.	Modify the classification limits (or the reduction factor in EN 1993-1-5) in order to eliminate the discontinuities.	5
FR8		5.5.2	Table 5.2	te	Sheet 3: inconsistency between the second condition for the classification of angles and the effective width according to EN 1993-1-5.	Remove the condition $(b + h)/(2\ t) <= 11,5\ \varepsilon$	6
FR9		6.2.1	(5)	ed	The note is not correct.	Replace by : « The verification according to (5) can be conservative as it excludes partial plastic stress distribution. Therefore it is preferable to use it where the interaction on the basis of design resistances N_{Rd}, M_{Rd}, V_{Rd} cannot be performed ».	1
FR10		6.2.3	(3)	te	This requirement is excessively severe and leads to onerous constructional details to fulfil it. The condition $N_{u,Rd} < N_{pl,Rd}$ involves the ratio of partial factors that have been calibrated to compare a design force to a design resistance, but not to compare two design resistances!	A specific study should be carried out in order to develop an appropriate condition that takes into account the correlation between the yield strength and the ultimate tensile resistance.	4
FR11		6.2.6	(3)	te	The formula of the shear area for a T-section assumes that it is possible to reach 0,577 f_y in any point of the shear area, including a contribution of the flange, even for welded Tee sections. This formula seems to be too optimistic.	Revise the shear area for T-sections.	2
FR12		6.2.6	(4)	ed	The note should be modified.	Replace by: « The verification according to (4) can be conservative as it excludes partial plastic stress distribution. Therefore it is preferable to use it…»	1
FR13		6.3.2.3	(2)	te	Table 6.6: If this method is kept, the determination of the coefficient k_c should be clarified, especially for moment diagrams where the sign of the moment	The coefficient k_c should be determined from a ratio between sagging moment and hogging moment.	5

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					changes along the member.		
FR1 4		6.3.2.4		te	This is a simplified method. However the field of application of this method should be clarified so that the method should always lead to results on the safe side in comparison with a reference method – method from 6.3.2.2 for example – that is supposed to give an optimal safety level.	Add application conditions as follows: - I or H profiles (rolled or welded) with doubly symmetric section ; - Lateral restraints against lateral displacement and rotation around the beam axis ; - No loads between two sections with lateral restraint when the application point is out of the shear centre.	4
FR1 5		BB.1.2	(2)	te	This clause should be redrafted because the reference to 6.2.9 is not appropriate for a member subject to buckling. No eccentricity is defined in 6.2.9.	Replace by: "When only one bolt is used for end connections of angle web members, the member should be checked by taking into account the bending moment resulting from the eccentricity. The buckling length L_{cr} should be taken as the system length."	1
FR1 6		BB.2.2		te	The origin of the method given in BB.2.2 seems to be the German standard DIN 18800-2. Out of this context and used in Eurocode 3, the method is not consistent and can even be unsafe because the length of the plateau of the buckling curve (LTB) is not the same and it also depends on the National Annexes.	Appropriate values of the factor K_θ should be provided in order to be consistent with the EC3 rules.	4
RO1		6.3	6.3.2	te	The situations when 6.3.2.2 or 6.3.2.3 (coupled or not with the use of relation (6.58)) should be used must be defined more clear, as 6.3.2.3 refers to "**rolled sections or equivalent welded sections**" and 6.3.2.2 refers to the general case but it contains precise recommendations only for **I** shapes, either rolled or not; for all the other cases, curve **d** is recommended. 6.3.2.2 (2) Explicit formulas for the calculation of critical moment for lateral-	A simple and conservative approach should be given in the code and more competitive alternatives could be given in Annexes.	5

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					torsional buckling M_{cr} and/or of the slenderness factor for lateral-torsional buckling should be indicated (annex F from ENV 1993-1-1:1992 could be very useful)		3, extension of rules not allowed, ECCS doc in preparation
RO2		6.3	6.3.3	ed	The number of notations should be reduced; for instance, in relations (6.61) and (6.62) Rk could be replaced with Rd. A single simplified procedure for the general stability check of uniform members subjected to bending and compression should be indicated in the code. Several more exact calculation procedures could be presented in an annex of the code. The current procedures indicated in Annex A and Annex B of EN 1993-1-1 are conducting to differences greater than 25% for different bending moment distributions cases.	The number of notations should be reduced	3, For reasons of clarity which Gamma-M has to be used it has to be kept as it is 5
RO3		6.4	6.4.3	te	The effective second moment of the area for a battened column is calculated with relation (6.74); if laces are added to this column, the relation to be used is (6.72) and the calculated value decreases, which is not normal, as the stiffness of the actual member increases.	The relation for calculating the effective second moment of the area for battened and laced columns, according to 6.4.2 and 6.4.3 should be revised.	3, The formula for laced columns is on the safe side
RO4		6.2	6.2.7 (4)		Formulas for the calculation of the stresses produced by warping torsion and St. Venant torsion in case of I-shaped cross-sections should be specified Table 6.2 should also include buckling curves for built-up cross-sections (for		3, No text book material to be included

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					example for cross-sections made of two closely spaced angles, or for cross-sections made of four, three or four largely distanced hollow sections)		3, No information available to include these items
RO5		6.3	6.3.1.2		6.3.1.2 (1) The formulas for the calculation of the critical forces for the relevant buckling mode N_{cr} (lateral buckling, torsional buckling, lateral torsional buckling) should be indicated explicit (at paragraph 6.3.1.2 or in an annex of the code)		3, No text book material in the code
RO6		6.4	6.4.1		6.4.1 (1) The formula for the initial bow imperfection should be changed taking into consideration the critical length of the member (e_0=L/500 should be modified into $e_0=L_{cr}/500$). For members with double hinged ends L=Lcr, but for other kind of end restraints the formula is not correct		4
RO7		6.4	6.4.1		6.4.1The current procedure, that uses the same value for the initial bow imperfection $e_0=L_{cr}/500$ for all situations conducts to unsafe results! Using different values for the initial bow imperfections, depending on the buckling curve of the chords cross-section could be a better approach (for example the values of the bow imperfections indicated in table 5.1 of EN1993-1-1:2005).		4
RO8		7.1	7.1		7.1 Limitations of the maximum values for the slenderness factors for compressed and tensioned elements should be indicated. The one indicated in the previous Romanian code STAS 10108-0/78 could be used!		3, Serviceability criteria depend on function and national views and are material independent.

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RO9		7.2 and 7.2	7.2.1 and 7.2.2		7.2.1 and 7.2.2 Limitations of the maximum admitted vertical and horizontal deformations should be indicated! . The one indicated in the previous Romanian code STAS 10108-0/78 could be used!		3, Serviceability criteria depend on function and national views and are material independent.
RO1 0		7.2	7.2.3		7.2.3 Explicit values for maximum floor or girder deformations should be indicated in order to limit excessive floor vibrations. The minimum frequency values to avoid excessive floor/girder vibrations could be also indicated (for different utilities).		3, Serviceability criteria depend on function and national views and are material independent.
GB1		5.6	Table 5.2 (sheet 3 of 3)	te	The limitation of (b+h)/2t for angles can be deleted as the verification is covered by checks on torsional and flexural-torsional buckling to clause 6.3.1.4. (Alternatively, consider deleting the requirement to check torsional and flexural-torsional buckling to clause 6.3.1 for angles if this shape limitation is retained.)		6
GB2		6.2.1(7)		te	The interaction can be interpreted as allowing the individual resistances to be derived based on section classifications for each effect applied separately. However, one section classification should be carried out under the combination of forces and moments and		3, From the wording in the code it is clear that one has to classify on the combination of internal forces.

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					then the relevant individual resistances should be determined from this one classification.		
GB3		6.3.1.4			The limitation of (b+h)/2t for angles in Table 5.2 sheet 3 of 3, if retained, could justify deleting the requirement to check torsional and flexural-torsional buckling to clause 6.3.1.4 for angles, which are time-consuming to carry out.		6
GB4	2	6.3.2.2 & 6.3.2.3	Paragraph 1	ge/ed	Clauses 6.3.2.2 & 6.3.2.3 offer two different methods for calculating the reduction value χ_{LT} for lateral torsional buckling. It is not clear when either method should be used, or which should be used for calculating χ_{LT} for plates. 6.3.2.2. is titled the 'general case' and applies to 'bending members of constant cross-section'. Following a discussion with the SCI it seems that 6.3.2.3 is more appropriate method for standard European hot rolled sections, and that 6.3.2.2 should be used when calculating χ_{LT} for plate girder sections deeper than 1 metre or simple plate cross sections. The wording is also confusing, as 6.3.2.3 applies to 'rolled or equivalent welded sections' which could also be classed as bending members of constant cross section.		5
GB5		6.6.3			Clause 6.3.3, sub-clause (4) gives formulae for satisfying combined axial compression and bending effects. This clause allows buckling checks to be done on columns in compression with beams including moment from rigid or semi-rigid connections on both axis and at both ends of the column.		

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					The procedure is to calculate the stiffness of the connections from the beam to the column then to model the stiffness of the connection into the analysis program. For simply supported beams where only nominal moment would be transferred into the column there does not appear to be a simple formulae that was available in BS 5950 clause 4.7.7 column in simple structures. For combinations of effects of beams with rigid and simple beam connections attached to columns BS 5950 allowed the following buckling interaction formulae: $F_c/P_{cy} + m_{Lt}M_{LT}/M_b + m_yM_y/p_yZ_y + M_{xs}/M_{bs} + M_{ys}/p_yZ_y < =1.0$ There is no comparable simple formulae in the Eurocodes for evaluating additional simple moments other than going through unnecessary connection stiffness checking and modified analysis runs. Excluding fully rigid beam connections and partially rigid beam connections where the moment transfer is typically fairly substantial can we also have a simple method for checking buckling cases for nominally pinned beam connections that are always deemed to be satisfied by BS5950 clause 4.7.7 for columns in		4

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					simple structures. This would allow additional terms to be added to the current interaction formulae in 6.3.3 sub-clause (4) to include for cases of **Axial compression + Rigid moment + Semi rigid moment + simple moments**.		
DE1				general	As there was not enough time for the German mirror group to handle all national comments on the revision of this Part of EC 3 more comments will be sent to TC 250 and SC 3 until the middle of December 2014.		Detailed comments in separate file
DE2		all	All	general	The revision process of EN 1993-1-1 should include: a) the correction of mistakes, b) the elimination of inconsistencies, c) the amendment of readability and d) the reduction of the subdivision and number of headings. The standard should be improved in user friendliness by applying principles of mechanics. Where empirical approaches cannot be avoided, they have to be labelled as such. The Eurocode should be state of the art and not the state of science.	All clauses of the standard should be reviewed considering the following comments.	1
DE3		1.6		technical	All symbols should be checked to avoid double definitions. Adaptation with the	We recommend to adapt the assortment, definitions of the variables should be	

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					remaining Eurocodes necessarily	checked. In subclause 1.6 all main and multiple used symbols should be explained. In addition extraordinary symbols should be explained in each special part of the code.	1
DE4		1.7		technical	The difference between “member axes” and “cross-section axes” for steel members is not defined clear enough.		1,Duplication to be avoided
DE5		1.7	(2)	technical	The definition for angle sections is given in figure 1.1.	Consider to remove the definitions *for angle sections. Revise the general definition.* Proposed systematic of the name is: x-u, y-v, z-w v-v 1. major principal axis w-w 2. major principal axis	1, PT to decide
DE6		1.7	Figure 1.1	technical	It lacks h_w = depth of web	Add h_w in figure 1.1.	1
DE7		4	(4)	technical	For first fatigue assessment a simplified method would be helpful.	The fatigue assessment can be renounced if the following conditions are fulfilled: $\Delta\sigma < 26\ N/mm^2$ $n < 5 \cdot 10^6\ (26/\Delta\sigma)^3$	2, Consult WG9
DE8		5.1; 5.2		ge, ed	The clauses 5.1 and 5.2 could be significantly reduced. The readability and clarity could be significantly improved.		1, PT to look at this
DE9		5.1.1		ge, ed	The subclause 5.1.1 can be reduced.	Consider to delete (1), (3), (4). We recommend to take over the German NCI to 5.1.1 into the code.	1 4
DE10		5.1.2	(2)	technical	This paragraph should be clarified.	Coordination with EN 1993-1-8 is necessary.	1
DE1		5.2.1	(4)B	ge, ed	It is textbook knowledge and could be	Consider to delete this paragraph.	4

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1					deleted.		
DE12		5.2.1(3)		te	Calculating the α_{cr} for the initial system does not prevent a premature stability failure when forming stepwise the plastic hinges and the α_{cr} of the initial system does not represent the deformation effect during the whole plastic analysis and may lead to unsafe assumption.	For plastic analysis the criterion in Eq. (5.1) should apply for the system before forming the last plastic hinge or should be checked for each individual system along the formation of the different plastic hinges. The limit values should then be taken as 10 instead of 15.	1
DE13		5.2.2	(1)	Ed	This is an unnecessary doubled explanation.	Consider to delete this paragraph.	1
DE14		5.2.2	(4), (5), (6)	Ed	It is textbook knowledge and could be deleted.	Consider to delete these paragraphs.	4
DE15		5.3; 5.5		ge, ed, te	Some of the clauses and subclauses could be significantly reduced. In some clauses major changes are required. The changes are necessary for a better handling and understanding.	Detailed information will be supplied later in addition to the given comments.	Detailed information is awaited
DE16		5.3.2	(2)			Add: "*for the relevant structural element*"	1
DE17		5.3.2 ((3) Eq.(.5)		te	Differentiate sway imperfection according to type of verification. To cover the effects of plastic zones where relevant.	Elastic verification 1/300 Plastic verification, α_{pl} max=1,25, 1/200 Plastic verification, α_{pl} max>1,25, 1/100	4
DE18		5.3.2 ((3) Eq.(.5)		te	Change reduction factor α_h ,because it is too conservative in comparison to measurements, see Beuth Kommentar DIN 18800 and background literature	Replace by square (5/l) Skip limitation of 2/3	4
DE19		5.3.2	Table 5.1	te, ed	The approach of the imperfections is partly to be viewed critically. For example in Table 5.1 it is to select an incorrect pre-curvature in dependence on the elastic or plastic calculation. The given values are only allowed in combination with a linear	Detailed information will be supplied until the middle of December 2014.	6

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					interaction, which unfortunately is not mentioned. Information of the approach by using a precise interaction (case 6.2) is not included. Here is an urgent need of supplements to obtain economic results.		
DE2 0		5.3.2	Table 5.1	ed	Change headings	Elastic verification instead of elastic analysis Plastic verification instead of plastic analysis	1
DE2 1		5.3.2	(10), (11)		Some changes are recommended.	Detailed information will be supplied until the middle of December 2014.	Detailed info awaited for the rest of the German comments
DE2 2		5.3.3			Some changes are recommended.	Detailed information will be supplied until the middle of December 2014.	
DE2 3		5.3.4	5.3.4	technical	The table from the German NDP should be inserted in the EC3. Information of the approach by using a precise interaction (case 6.2) is not included. Here is an urgent need of supplements to obtain economic results.	Detailed information will be supplied until the middle of December 2014.	
DE2 4		5.5	5.5.2 and table 5.2	technical	There is no information how to deal with the combined forces N- M_y. The classifications of angle profiles are partially in conflict with the reference to flanges.	Detailed information will be supplied until the middle of December 2014.	
DE2 5		5.5; 5.6		technical	Some of the clauses and subclauses could be significantly reduced. Some changes are recommended.	Detailed information will be supplied until the middle of December 2014.	
DE2 6		6.1		technical	Editorial changes for a better readability are recommended.	Detailed information will be supplied until the middle of December 2014.	
DE2 7		6.2		ge, te,ed	It is virtually impossible to see when an elastic or plastic calculation is performed. Equations are often given twice for cross-	In clause 6.2 major changes are required to organize it more logically. Detailed information will be supplied until the middle of	

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					section-classes 1-2, 3 and 4. This results in a poor readability. Mechanical aspects are hardly recognizable.	December 2014.	
DE28		6.3		Editorial, technical	We would recommend to change the structure of the chapter to get a better readability and to ease the use. Some of the subclauses and paragraphs could be significantly reduced or deleted. 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.	Detailed information will be supplied until the middle of December 2014.	
DE29		BB.3		technical editorial	The rules are not clearly mechanical based and partly in conflict with 6.3.2.4.	Consider to delete the Annex from the code and move into secondary literature.	
DE30		6.4		editorial	We would recommend to change the structure of the chapter to get a better readability and to ease the use. Some of the subclauses and paragraphs could be significantly reduced or deleted.	Detailed information will be supplied until the middle of December 2014.	
DE31		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. Detailed information will be supplied until the middle of December 2014.	
DS/ DK1		GE		GE	Please consider and respond to the following 6 questions using the generic comment template provided. 1. Do any clauses require editorial or technical	As the mandate M/515 has been agreed and presently is awaiting the tender process by NEN and the financial agreement between the EC Commission and CEN we find pinpointing specific	

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					correction? 2. Which clauses would benefit from improvements in clarity? 3. Where should the scope of the EN be extended? 4. Where could the EN by shortened? 5. Are there any clauses whose application leads to uneconomic construction? 6. Are there any clauses whose application necessitates excessive design effort?	clauses for improvements, clarifications etc. is a work that should be undertaken in the SC, WG and PT. Therefore, the following comments are primarily from the National Annex and other selected comments. There will be additional comments from Denmark through the future work in SC, WG and PT.	
BE1				Ge	Belgium is not able to upload its comment on time. We will communicate our complete comments before 2015-01-15 at the latest.		
GR1		1.3		ed	Compliance with EN 1090 is a requirement not an assumption		1
GR2			Fig. 1.1	Ed	Two figures are included for Tee sections	One of the two figures for Tee sections should be deleted.	1
GR3		1.5		ed	The list of terms and definitions is too selective. Clause 1.5 should be either extended or, preferably, deleted.		1
GR4		3.2.2		ed	The first condition is an over-strength rather than a ductility requirement	Reformulate	3, Required overstrength leads to ductility
GR5		5.2.1(4)B		Ed	Definition of H_{Ed} needs improvement	….at the bottom of the storey **due** to the horizontal….	2, see comment FR1
GR6		5.2.1(4)B		Ed	Definition of $\delta_{H,Ed}$ needs improvement	…when the frame is loaded with **the** horizontal loads **corresponding to H_{Ed}**	2, see comment FR1
GR7		5.3.2 (11)		te	Equations (5.9) and (5.10) lack in clarity. The definition of the critical cross section for a general	Correct/clarify this clause	6

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					framed structure could be ambiguous.		
GR8		5.3.4 (3)		Te	A less conservative definition of K could be defined.	Formula for K.	6
GR9		6.2.2.1(5)		Ed		Replace “then” with “than”.	1
GR10		6.3.3.(4)		te	The interaction formula examines compression and major axis moment separately. It finds the relevant critical states, separately for compression and bending and determines the corresponding slenderness for flexural and lateral torsional buckling. However, the critical state is unique for a beam subjected to simultaneous compression and bending, i.e. it exist a single load multiplier which leads to the critical state. Such a procedure that is also followed in EN 1993-1-5 for plate buckling should be followed.	Develop a new buckling formula for beam-columns.	5, Work was done on these rules in the WG going for a wider scope.
GR11		6.3.3.(5) Annex A, Annex B		te	In many cases, significantly different interaction factors (and consequently safety factors) are obtained from the two alternative methods. This can be confusing.	Unify the two methods, or provide clear criteria for selecting one method over the other.	~~6~~ 2
GR12		6.4.4()			Allowance for FE Analysis Method and/or other type of attachment could be offered for definining the level of integrity of built-up members.	Note for allowance.	3, In general FE analysis is possible, not only for built-up members
GR13		Anx.BB.2.2		Ed	Double Reference of Ku	Ku=0,35 for elastic analysis; 1,0 for plastic analysis	1
PL1				ge, te	**Member design buckling resistance** (compression $S_{Rd,b} = N_{b,Rd}$ and bending $S_{Rd,b} = M_{b,Rd}$). **Present formulation of EN 1993-1-1:**	**Proposed general/technical changes:** Buckling of compression members: $N_{b,Rd} = \frac{\chi N_{c,Rk}}{\gamma_{M1}}$,	

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					$S_{b,Rd} = \frac{\chi_b(\bar{\lambda}_k)S_{c,Rk}}{\gamma_{M1}}$, where $\bar{\lambda}_k = \sqrt{\frac{S_{c,Rk}}{S_{cr}}}$, and: $S_{c,Rk}$ is the characteristic (nominal) section resistance, S_{cr} - nominal value of the elastic critical compression force or bending moment. **The buckling reduction factor** $\chi_b(\bar{\lambda}_k)$ **is the solution of Ayrton-Perry equation for the nominal resistance [1]:** $(1-\chi_b\bar{\lambda}_k^2)(1-\chi_b)-\eta\chi_b = 0$ where Maquoi-Rondal imperfection coordinate: $\eta = \alpha_b(\bar{\lambda}_k - \bar{\lambda}_{k,0})$, while α_b - is the imperfection factor describing the buckling curve, and $\bar{\lambda}_{k,0}$ =0,2. **Observation** - the calculation of design buckling resistance is consistent only when $\gamma_{M1} = \gamma_{M0}$ =1, as it has been suggested in EN 1993-1-1. In general the partial factors may be of different values, and furthermore – greater than unity. Thus, when γ_{M1} >1 and γ_{M0} >1 as well as $\gamma_{M1} \neq \gamma_{M0}$, there is $\chi(\bar{\lambda}_k \leq 0{,}2) = 1$, yielding for stocky elements $\bar{\lambda}_k \leq 0{,}2$ the member design buckling resistance that is not equal to the design section resistance: $S_{b,Rd} = \frac{S_{c,Rk}}{\gamma_{M1}} \neq S_{c,Rd} = \frac{S_{c,Rk}}{\gamma_{M0}}$. On the other hand, for slender elements	the following changes to be introduced: $\chi = \frac{1}{\phi + \sqrt{\phi^2 - \left(\bar{\lambda}\sqrt{\frac{\gamma_{M1}}{\gamma_{M0}}}\right)^2}} \frac{\gamma_{M1}}{\gamma_{M0}} \leq \frac{\gamma_{M1}}{\gamma_{M0}}$ $\phi = 0{,}5\left[1 + \alpha(\bar{\lambda} - 0{,}2) + \left(\bar{\lambda}\sqrt{\frac{\gamma_{M1}}{\gamma_{M0}}}\right)^2\right]$ Lateral-torsional buckling of bending members: $M_{b,Rd} = \frac{\chi_{LT} M_{c,Rk}}{\gamma_{M1}}$, the following changes to be introduced: $\chi_{LT} = \frac{1}{\phi + \sqrt{\phi^2 - \left(\bar{\lambda}_{LT}\sqrt{\frac{\gamma_{M1}}{\gamma_{M0}}}\right)^2}} \frac{\gamma_{M1}}{\gamma_{M0}} \leq \frac{\gamma_{M1}}{\gamma_{M0}}$ $\phi = 0{,}5\left[1 + \alpha(\bar{\lambda}_{LT} - 0{,}2) + \left(\bar{\lambda}_{LT}\sqrt{\frac{\gamma_{M1}}{\gamma_{M0}}}\right)^2\right]$	6, Under discussion as part of and depending on the outcome of the Gamma-M discussion

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					$\chi\left(\bar{\lambda}_k \to\infty\right)\to \frac{1}{\bar{\lambda}_k^2} = \frac{S_{cr}}{S_{c,Rk}}$ and the resistance is approaching the design resistance of slender members (i.e. the perfect elastic critical axial force or bending moment based on the nominal value of elasticity modulus divided by the partial factor for the member resistance): $S_{b,Rd} = \frac{S_{cr} S_{c,Rk}}{S_{c,Rk}\gamma_{M1}} = \frac{S_{cr}}{\gamma_{M1}}$. **In order to avoid the above inconsistency, the following options may be introduced [2]:** a) approach based on “design slenderness” and constant partial factors γ_{M1} and γ_{M0}: $S_{b,Rd} = \frac{\chi\left(\bar{\lambda}_d\right) S_{c,Rk}}{\gamma_{M1}}$ where: $\bar{\lambda}_d = \sqrt{\frac{S_{c,Rk}}{S_{cr}}}\sqrt{\frac{\gamma_{M1}}{\gamma_{M0}}} = \bar{\lambda}_k \sqrt{\frac{\gamma_{M1}}{\gamma_{M0}}}$, $\chi = \frac{1}{\phi + \sqrt{\phi^2 - \bar{\lambda}_d^2}} \frac{\gamma_{M1}}{\gamma_{M0}} \le \frac{\gamma_{M1}}{\gamma_{M0}}$, $\phi = 0{,}5\left[1 + \alpha(\bar{\lambda}_k - 0{,}2) + \bar{\lambda}_d^2\right]$, or: b) approach based on “nominal slenderness” and slenderness dependent partial factor γ_M: $S_{Rd,b} = \frac{\chi\left(\bar{\lambda}_k\right) S_{c,Rk}}{\gamma_M\left(\bar{\lambda}_k\right)}$ where an interpolation function for the partial		

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					factor should satisfy the following conditions: $\gamma_M\left(\bar{\lambda}_k \to 0\right) \to \gamma_{M0}$, $\gamma_M\left(\bar{\lambda}_k \to \infty\right) \to \gamma_{M1}$. Suggested interpolation function: $\gamma_M\left(\bar{\lambda}_k\right) = \begin{cases} \gamma_{M0} & \text{if} \quad \bar{\lambda}_k \le \bar{\lambda}_{k0} \\ \gamma_{M1} - \dfrac{\gamma_{M1} - \gamma_{M0}}{1 + \sum_i a_i \left(\bar{\lambda}_k - \bar{\lambda}_{k0}\right)^i} & \text{if} \quad \bar{\lambda}_k > \bar{\lambda}_{k0} \end{cases}$ where a_i – constants. **Note:** Only when $\gamma_{M1} = \gamma_{M0} = 1$, like recommended in EN 1993, $\bar{\lambda}_d = \bar{\lambda}_k$ and $S_{b,Rd} = \chi\left(\bar{\lambda}_k\right) S_{c,Rk}$, so that the shown inconsistency might vanish. **References:** [1] Simoes da Silva L., Simoes R., Gervasio H., Design of Steel Structures. Eurocode 3Part 1-1: General rules and rules for buildings. ECCS Eurocode Design Mauals, Ernst & Sohn, Berlin 2010. [2] Gizejowski M., Stachura Z. "On necessity of partial factors revision for design of steel structures", Inzynieria i Budownictwo, no. 9/2014 [in press, in Polish].		
FI1				General	In these Finnish comments line number has not been given mainly due to the following reasons: -CEN has not defined how the line number should be calculated ***from the beginning or from the end of the standard ***form the top or the bottom of the page ***from the beginning of section, clause or		

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					subclause -We assume that people giving answers to these comments are clever enough to understand if the reference is made for example to clause 1.2.3.4(5)		No comment
FI2		1.1		te/ed	Rules for the design of web opening would be very welcomed, see ENV 1993.		6
FI3		1.2.2		ed	Some EN-standards are missing from the list, for example EN-standards related to dimensions and tolerances of some rolled profiles, see EN 1090-2 section 5. Also standards EN 10149-1, -2 and -3 should be added, see Finnish comments later on.		1
FI4		2.3.1(1)	Note 1	te	Accidental loads should be covered in EN 1991 (including ice loads) and load combinations (including ice loads) in EN 1990. In the Finnish NA for EN 1993-1-1 it is stated: “The rules in Standard SFS-EN 1990 and Standard SFS- EN 1991 including their National Annexes should be used. For determining characteristic values of ice loads Standard ISO 12494 should be used.” Reference should be made to ISO 12494.	Delete reference to accidental loading. Add reference to ISO 12494 as application rule.	3, Loading not to be treated in the steel code
FI5		2.3.2(1)		te	This clause should be modified taking into		

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					account: 1) This clause seems to be in conflict with some clauses of section 3, where NDP`s are allowed for materials and material properties. 2) Also national technical approvals should be allowed. 3) ISO-standards and EN-ISO standards should also be allowed. On the other hand it should also kept in mind, that general trend seems to be that many EN-standards will be changed into EN-ISO standards. 4) At EU-level is has been decided that national approvals given in countries belonging to European Economic Area are acceptable. 5) Is the wording “other construction product” really needed or should it be “other construction product made of steel”? The scope of EN 1993-1-1 is the design of steel structures, therefore why to give rules of “other construction product”. Maybe the intention is to say something of “orher steels”. 6) See also EN 1090-2, where also other steels may be accepted if they are defined. This actually means that EN 1993 and EN 1090 are in contradiction with each other, which is not generally acceptable. 7) Also the terminology used EN 1993 and EN 1090 seems to be different, which should also be harmonized. One example: Expression “constituent product” is used in EN 1090-2, but not in EN 1993.		4
FI6		2.4.2(1)		te/ed	Replace “hEN” by “EN”. Most of the relevant standards are “EN” and not	Replace “hEN” by “EN”.	1

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					"hEN".		
FI7		2.5(1)		te	The clause (1) is probably not true in all cases. Only two examples: 1) Formula (6.3) is based on studies made in the beginning of 1930 and those test results are not analyzed according to Annex D of EN 1990. 2) Formula (6.68) has been developed in USA much before than Annex D of EN 1990 was published. It is proposed to delete this clause. Other arguments: a) The users of EN 1993 are not interested on how different rules have been developed. b) This kind of information belongs to background documents, not into standards. Some other comments:	Delete the clause.	2

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					a) Important is to say that when new rules are developed in the future then Annex D of EN 1990 should be followed, but this kind of rule should be given in EN 1990.		
FI8		2.5(2)			The clause 2.5(1) is probably not true in all cases. It is proposed to delete this clause (2). See also Finnish comments to 2.5(1)	Delete the clause.	2
FI9		2.5(2)	Note 1	te	Note 1 should be reformulated. One proposal is on the right hand side.	(x) When new rules are developed based on testing 5% - fractile should be used.	2
FI10		2.5(2)	Note 2	te	The note is self-evident and shall be deleted. If not deleted, then similar reference should also be made to EN 1993-1-3, EN 1993-1-5, etc.	Delete the note.	2
FI11		2.5(2)	Note 3	te	The note is self-evident and shall be deleted. If not deleted, then similar reference should also be made to EN 1993-1-3, EN 1993-1-5, etc.	Delete the note.	2
FI12		2.5(3)		te	The use of testing for the design should be self-evident and therefore this clause could be deleted totally. However some technical issues:	Delete this clause.	2

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					a) EN 1993-1-3 gives detailed rules for testing, which are in conflict with annex D of EN 1990 in some details. The question in this case is if rules in EN 1993-1-3 or rules in Annex D of EN 1990 should be used in practice. b) Also EN 1993-5 gives some rules for testing, which are overlapping with rules given in EN 1993-1-3.		
FI13		3.1(1)		te	The wording should be changed as proposed on the right hand side. Arguments: See Finnish comments to 2.3.2(1)	(1) The nominal values of material properties given in the applied standard should be adopted as characteristic values in design calculations. (2) If other steels than mentioned in clause (1) are used their material properties should be known and be determined according to relevant EN-testing standards.	3, Has been discussed in the past and then the two options, this code or EN 10025, were created. Further see 3.2.1 in the Note. There will be a need for national choice.
FI14		3.1(2)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: “In addition to the materials given in the table 3.1 the following steel grades may also be used: a) Steel grades S315MC, S355MC, S420MC and S460MC according to the Standard SFS-EN 10149-2. b) Steel grades S260NC, S315NC, S355NC and S420NC according to the Standard SFS-EN 10149-3. c) Steel grades with valid national product approval which refers to the clause 3.1(2) of the National Annex to the standard	Add standards SFS-EN 10149-2 and SFS-EN 10149-3 into 1.2.2 and all other relevant clauses of various parts of EN 1993, for example EN 1993-1-1, EN 1993-1-8, EN 1993-1-10, EN 1993-1-2	3, see FI13

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					SFS-EN 1993-1-1 and states that the said steel grade is suitable for use in accordance to standard SFS-EN 1993-1-1. In the cases a) and b) the requirement for the fracture toughness should be determined according to the option 5 in the section 11 of the Standard SFS-EN 10149-1. The properties of steels should fulfil the general requirements given in Standard SFS-EN 1993-1-1 and in its National Annex. β_w- values to steel grades according to Standards SFS-EN 10149-2 and SFS-EN 10149-3 is given in the National Annex of Standard SFS-EN 1993-1-8. For steel grades according to Standards SFS-EN 10149-2 and SFS-EN 10149-3 mechanical properties at elevated temperatures may be determined according to National Annex of Standard SFS-EN 1993-1-2. For steels according to Standards SFS-EN 10149-2 and SFS-EN 10149-3 maximum permissible values of element thickness may be determined according to National Annex of Standard SFS-EN 1993-1-10." Delete the note and make it as general application rule. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of	Delete the note and add application rule without NDP as follows: (2) If other steels than mentioned in clause (1) are used their material properties should be known and be determined according to relevant EN-testing standards. - see Finnish comment to 3.1(2) above	

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					the number on NDP`s, which is also an argument for our proposal.		
FI15		3.2.1(1)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: "Both alternatives may be used" The key questions are: 1) Is it acceptable also in the future that different mechanical properties and different thickness limits are given in table 3.1 than in the material standard? 2) In all parts of EN 1993 the same philosophy should be used. ***Compare also some other parts of EN 1993, where similar tables than 3.1 are not given. ***Compare for example clause 3.1(1) of EN 1993-1-6, where it is stated: "The material properties of steels should be obtained from the relevant application standard." 3) By making references to the material standards it should be taken into account also, that the material standards are quite often revised in about 5 years period, but EN 1993 is revised maybe ones in about 25 year.		3, see previous points
FI16		3.2.2(1)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: "Steels used should fulfil the requirements given in the Note, if not otherwise mentioned in some part of Standard SFS-EN 1993 or in other National Annexes of Standard SFS-EN 1993." The recommended values are used in the	Make the note as application rule without national choice. (at least up to steel grade S460).	3, see previous points

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					Finnish National Annex. Therefore, Finland may also accept, if recommended values are changed into application rules without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal. Some other remarks: - EN 1993-1-12 is under development and the intention of EG EN 1993-1-12 is to include also steels up to S960 - see our comments to EN 1993-1-12 - depending on the development it may be need for some national choice for steel over S460		
FI17		3.2.2 and 5.5.2	General comment	te	The problem is that there are many steel grades which do not fulfil all of these three rules. Perhaps a more logical approach should be considered: give the required ductility rules based on cross-section classes 1, 2, 3 (and 4), not based on steel grades. Would it be possible to develop more logical approach by giving required ductility rules based on cross-section classes 1, 2, 3 and 4 and not based on steel grades.		4
FI18		3.2.3(1)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: “The lowest service temperature should be determined according to Standard SFS-EN 1991-	The fracture toughness should be checked in all operating temperatures with relevant load case corresponding that temperature. The situation	

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					1-5 and its National Annex. The fracture toughness should be checked in all operating temperatures with relevant load case corresponding that temperature. The situation during erection stage should also be taken into account by using appropriate load combinations and temperatures during erection."	during erection stage should also be taken into account by using appropriate load combinations and temperatures during erection."	4
FI19		3.2.3(3)B	Note B.	te	In the Finnish NA for EN 1993-1-1 it is stated: "σ_{Ed} = 0,25 $f_y(t)$ should be used for building component under compression. Clause 2.1(2) of Standard SFS-EN 1993-1-10 states that fracture toughness need not be specified for elements only in compression. However the recommendation in clause 3.2.3(3)B above should be used." Arguments/clarifications: a) In clause 2.1(2)/Note of EN 1993-1-10 it is stated. "**NOTE** For elements not subject to tension, welding or fatigue the rules can be conservative. In such cases evaluation using fracture mechanics may be appropriate, see 2.4. Fracture toughness need not be specified for elements only in compression.""" b) Theoretically note of clause 2.1(2) of EN 1993-1-10 is correct, but it is in conflict with the recommendation of clause 3.2.3(3)B/Note	Add as application rule without any national choice: σ_{Ed} = 0,25 $f_y(t)$ should be used for building component under compression.	2

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					B of EN 1993-1-1. c) In all structures including buildings there may be tension stresses (for example initial stresses) which are not considered in the design. Therefore it is justified and recommended that the value $\sigma_{Ed} = 0{,}25\ f_y(t)$ should be used always.		
FI20		3.2.4(1)	Note 3B Table 3.2	te	In the Finnish NA for EN 1993-1-1 it is stated: "The table 3.2 should be applied for building structures." Therefore, Finland may also accept, if the note 3B is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal. Some technical/editorial issues: a) We have not checked if similar note is given in all "application parts of EN 1993" (EN 1993-2, 3, 4, 5 and 6), probably not? b) Because steel as material does not yet know, if it used in building, bridge, tower, mast, chimney, tank, silo, pipeline, pile or crane supporting structure, we propose to change this note 3B as general application rule for all parts of EN 1993 (= not only for buildings).	Change the note 3B into application rule without any national choice as follow: The table 3.2 should be applied for all steel structure covered by EN 1993.	2

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FI21		3.2.5(2)		te	EN 1090-2 allows as alternative in some cases tolerances also according to EN ISO 13920. Is that acceptable also by SC3 from safety of structures point of view? In some cases some tolerances according to EN ISO 13920 seems to larger than assumed in the design rules given in EN 1993-1-1.		4
FI22		3.2.5(2)		te	Clause (2) should also be applied for rolled profiles (or component) (including structural hollow sections) after workshop fabrication.	For welded, rolled profiles and for structural hollow sections the tolerances given in EN 1090-2 should be fulfilled after workshop fabrication. or For welded, for rolled components and for structural hollow sections components the tolerances given in EN 1090-2 should be applied after workshop fabrication.	2
FI23		3.4		te	It is proposed to delete this clause totally due to several reasons, like: 1) What is meant by “other prefabricated products”? Made from steel or also from other materials? 2) Various “other prefabricated products” does	Delete the clause totally.	2

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					not belong to Eurocode-system.		
FI24		4		ed	Corrosion rate should be taken into account, when defining the gross section classes. In the clause 5.2.1(4) of EN 1993-5 it is stated. “(4) The limiting proportions for class 1, 2 and 3 cross-sections may be obtained from Table 5-1 for steel sheet piles, taking into account a possible reduction of steel thickness due to corrosion.” Similar clause should also be added into EN 1993-1-1.	(x) A possible reduction of steel thickness due to corrosion should be taken into account in determining cross section classes.	2
FI25		5.2.1(3)	Formula (5.1)	te	The use of this formula may need restrictions. It is not very accurate in many cases. More detailed recommendations are welcomed.	1, see DE12	~~2, see GE12~~
FI26		5.2 & 5.3		te	To be cleared: Lateral support forces of compressed chords of roof trusses: The force flow through supporting system (1: trapezoidal steel sheet or similar “plate system”. 2: Purlins or other similar “non-plate” system). In which cases the forces need to be taken to foundations? How should the lateral support of bolted splice connections of trusses be treated? There are some rules in clause 6.3.5, but clarifications are needed.		Q1: Difficult to generalise. Applied mechanics should be used - 3 Q2: 4, see 6.3.5

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FI27		5.2.1(3)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: “Other values for α_{cr} is not given.” The recommended value is used in the Finnish National Annex. Therefore, Finland may also accept, if recommended value is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal.	Delete the note and give it as application rule without national choice.	~~2, see GE12~~ 1 see DE12
FI28		5.2.1(5)		te/ed	It is proposed that rules given in EN 1993-1-5 dealing with global analysis (dealing with shear lag) are transferred to EN 1993-1-1/Section 5.	All rules for shear lag dealing with global analyses should be given only in one place, preferable in EN 1993-1-1/Section 5. Also the rules dealing with the determination of resistance in the case, when shear lag should be taken into account, should also be given only in one place (either in EN 1993-1-1 or in EN 1993-1-5).	5, Keep the rules where they are now
FI29		5.2.2(8)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: “Buckling lengths should be determined according to the rules of structural mechanics. When this method is used the second order effects should be taken into account in the design of cross-section resistance of members and in the design of joints, connections and splices.”	Add: (x) Buckling lengths should be determined according to the rules of structural mechanics.	3. This is obvious

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					The key points are: a) The second order effects should be taken into account also in the design of cross-section resistance of members and in the design of joints, connections and splices." b) The title of 5.2.2 is "Structural stability of frames", which (= stability) does not cover cross-section resistance or resistance of joints, connections or splices. In the translation of EN 1993-1-1 into Finnish as SFS-EN 1993-1-1 the last sentence in corrected as follows: In this case internal forces and moments, needed for the resistance calculations, should be determined based on the first order theory without taking into account imperfections given in table 5.1. However in the second order calculations according to the clause 5.3.2(6) (in the sensitive case for second order effects) the initial bow imperfection of the member should be taken into account.	(xx) When this method is used the second order effects should be taken into account also in the design of cross-section resistance of members and in the design of joints, connections and splices. Change the last sentence as follows: In this case internal forces and moments, needed for the resistance calculations, should be determined based on the first order theory without taking into account imperfections given in table 5.1. However in the second order calculations according to the clause 5.3.2(6) (in the sensitive case for second order effects) the initial bow imperfection of the member should be taken into account.	2 3, Text is confusing
FI30		5.3 + various sub-clauses	General	te	Section 5.3 is giving rules for structural analysis, but detailed rules for which forces joints (connections and connectors and splices) should be designed are mainly missing. See Finnish comments to other relevant clauses of EN 1993-1-1.		No comment
FI31		5.3.2(3)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: "The values according to Table 5.1 should be used."	Delete the note and give it as application rule without national choice.	

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					The recommended value is used in the Finnish National Annex. Therefore, Finland may also accept, if recommended value is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal. See also Finnish comment to 5.3.2(3)/Note.		4
FI32		5.3.2(3)	Note Table 5.1	te/ed	The recommended values are used in the Finnish National Annex. Therefore, Finland may also accept, if recommended value is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal.	Change the note into application rule without any national choice. Move this kind of information into normative annex of EN 1993-1-1 taking into account at least: - all details needed for theoretically second order calculations should be collected into one place in EN 1993-1-1 - details given in Annex C of EN 1993-1-5 should be moved into "one place" mentioned above - in addition some general rules or principles of using FE-methods in the resistance calculation should be given in EN 1990	4 3, Keep the information where it is now.
FI33		5.3.2(5)B	Figure 5.3	te/ed	The figure 5.3 in unclear: - on the left hand side the angle is Ø/2 and on the right hand side Ø - clarification of the meaning is needed, clarification to the figure 5.3 is needed In our understanding the aim has been that the	Change the figure, notation and wording to same in EN 1992 and EN 1993 (at least in EN 1992 and EN 1993)	4

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					meaning of figure 5.1 (+ relevant text) of EN 1993 and figure 5.1 (+ relevant text) of EN 1992 should be same - however figures, notations and wording are different in EN 1992 and in EN 1993, maybe the outcome is same if correctly understood.		
FI34		5.3.2(11)	Note 2	te	In the Finnish NA for EN 1993-1-1 it is stated: “The method is not used. “ The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is one argument for our proposal. On the other hand there is no need to give various alternatives in standards.	Delete clause 5.3.2(11).	3, Method is needed, text to be clarified.
FI35		5.3.4(3)		te	In the Finnish NA for EN 1993-1-1 it is stated: “The value k = 0,5 should be used.” The recommended value is used in the Finnish National Annex. Therefore, Finland may also accept, if recommended value is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal.	Delete the note and give it as application rule <u>without national choice.</u>	6, see DE23, GR8
FI36		5.5.2	Table 5.2	te	In the case of class 3 sections stress ratio	Add rules, when second order effect and	

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					ψ is needed, which depends on normal force and bending moment. The question is should also second order effects be taken into account when ψ is determined ? If so in which cases? If not then that should be explained clearly. Rules when second order effects should be taken into account and when not, should be added.	actual stress state should be taken into account.	4
FI37		5.5.1	Table 5.2	te	For structural hollow sections c should be defined as given in clause 4.4(2) of EN 1993-1-5.		2, Request for change in part 1-5.
FI38		6.1(1)	Note 1	te	In the Finnish NA for EN 1993-1-1 it is stated: "Partial factors for structures not covered by Standard SFS-EN 1993 are not given." Note is not needed and could be deleted, because no need to try to cover structures which are not covered in Eurocode. On the other hand it would be useful to give some recommendations for some typical steel structures, like windmills.	Delete the note. Recommendations with recommended values are welcomed.	3, It is good to have a 'fall back' safety level corresponding to that for bridges
FI39		6.1(1)	Note 2B	te	In the Finnish NA (at the moment proposal for revision) for EN 1993-1-1 it is stated: "The recommended values should be used. When using partial safety factor γ_{M1} = 1,0 it is assumed, that the initial geometric bow	Add: When using partial safety factor γ_{M1} = 1,0 it is assumed, that the initial geometric bow imperfection (tolerance) of the compression member is not more than L/1000.	6

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					imperfection (tolerance) of the compression member is not more than L/1000. In addition following "application rules" are given in the Finnish NA of EN 1993-1-1, see below.	and add rules given below:	

"”1 Design at ultimate limit state

1.1 General

(1) When departing from tolerances, which are as background to the design rules, towards unfavourable direction from the point of view of the resistance of the structure, it should be shown by calculations that the safety level required in SFS-EN 1993-1-1 and its National Annex is achieved.

(2) When in the design assumed initial geometric bow imperfection is greater than L/1000, the compression member should be designed as compressed and bended member, in which case the increase of the design bending moment ΔM_{Ed} at the location of the greatest deflection $v_{desin\,g}$ should be calculated using the formula:

$$\Delta M_{Ed} = N_{Ed}(v_{desin\,g} - L/1000) \qquad (1.1)$$

where $v_{desin\,g}$ is in the design assumed initial geometric bow imperfection.

Description:
According to SFS-EN 1090-2 geometric imperfection (tolerance) of the compression member is usually L/750.""

FI40		6.1(1)	Note 2B	te	Recommended values for accidental limit states (see EN 1991-1-7) (except fire) are missing form EN 1993-1-1 and also from other parts of EN 1993. Compare other parts of material related Eurocodes, where recommended values are given.	At the accidental limit states (except fire) same design formulas and design criteria as well as partial safety factors as at normal temperature design may be used, except that $\gamma_{M2} = 1{,}1$"	

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					In the Finnish NA for EN 1993-1-1 it is stated: "At the accidental limit states (except fire) same design formulas and design criteria as well as partial safety factors as at normal temperature design may be used, except that $\gamma_{M2} = 1{,}1$"		2
FI41		6.2.1(9)	Note	te	Clause (9) and the note seems to be in contradiction to each other. Compare also clause 4.3(5) of EN 1993-1-5 for static resistance. Clarification and harmonization between EN 1993-1-1 and EN 1993-1-5 is needed. Note: - Take also into account that resistance of cold-formed sections according to EN 1993-1-3 should always be calculated based on mid-lines and EN 1993-1-3 is applicable up to 15 mm (recommended value). Therefore harmonization with EN 1993-1-3 is needed.	1) Harmonize basic rules between EN 1993-1-1 and EN 1993-1-5. 2) Section modulus should be calculated to the extreme fiber.	2
FI42		6.2.3(1)		te/ed	In this clause (compare also some other clauses of EN 1993-1-1) general condition E ≤ R is given. For example formula (6.5). If this kind of general conditions are finally used, they should also be added also to other similar clauses on various parts of EN 1993, where such conditions are not given.		1, To be harmonised into unity checks

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FI43		6.2.3(2)	Formula (6.7)	te	If there is no hole ($A=A_{net}$) should the resistance according formula (6.7) to be checked or not? Clarification is needed, because designers seem to have different interpretations.		1, Check not needed in case of no bolts present
FI44		6.2.3(2)	Formula (6.7)	te	According to our understanding the background for coefficient 0,9 is that there may be small crack depending of the way how the hole has been made. On the other hand according to our understanding small additional crack has been taken into account also in determining the values given in the tables on EN 1993-1-10. The question is, if the coefficient 0,9 is still needed in the formula (6.7) or not?		6
FI45		6.2.3(2)	Formula (6.7)	te	The resistance for tension at net section. 1) Compare formula in the table 8.1 (rivets) of EN 1993-1-3, where coefficient 0.9 is not used. 2) Compare formula in the table 8.2 (self-tapping screws) of EN 1993-1-3, where coefficient 0.9 is not used. 3) Compare formula in the table 8.3 (cartridge fired pins) of EN 1993-1-3, where coefficient 0.9 is not used. 4) Compare formula in the table 8.4 (bolts) of EN 1993-1-3, where coefficient 0.9 is not used, but different formula for reduction factor is given		6

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					and the maximum value is as given in table 8.4 of EN 1993-1-3. 5) EN 1993-1-3 covers cold-formed components made of steels up to 15 mm, for example cold-formed components made of steels according to EN 10025. The key question is: Why the tension resistance of the net section if different depending on if the member itself is made by welding or by cold-forming, but the steel itself is same. Clarification and harmonization is needed.		
FI46		6.2.6(3)		ed	How the height of web, h_w, is defined? See Fig. 5.1 of EN 1993-1-5. Definition of various parts of EN 1993 should be same.		1, 5
FI47		6.2.8(5)		te	There seems to be inconsistencies between formulas (6.29) and (6.30) and in the determination of A_w . Formula (6.30) give better result for rolled and welded profiles, because A_w is lower than A_v. A_v is needed in the calculation of $V_{pl.Rd}$. In the calculation of A_v for rolled profiles A_v include the flange and a part of “rounding”. The question is: Should the shear resistance to be calculated by using A_w, when the formula (6.30) is used?		6
FI48		6.3.1.2(2)	Table 6.2	te	Steel grade S450 is missing from the table 6.2. Maybe also some other steel grades (mentioned in material standards like EN 10025) are missing.	Add buckling curves for steel grade S450.	2, belongs to S420 column, to be checked

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FI49		6.3.1.2(2)	Table 6.2	te	For welded box sections given conditions are: "Thick welds: a > 0,5t_f b/t_f < 30 h/t_w <30" Should all of the conditions are fulfilled at same time? 1) If so, add "All conditions should be fulfilled at same time" 2) If not give clarification.		2, weld thickness and one of the plate slenderness requirements
FI50		6.3.2.2(2)	Table 6.3	te	In the Finnish NA for EN 1993-1-1 it is stated: "The values given in the table 6.3 should be used." The recommended value is used in the Finnish National Annex. Therefore, Finland may also accept, if recommended value is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal. See also Finnish general comments on lateral torsional buckling above.	Delete the note and give it as application rule without national choice.	5
FI51		6.3.2.3(1)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: """a) For rolled double symmetric I-sections and H-sections and hot-finished and cold-formed hollow sections with constant cross section the	See the text on the left hand side and below taken from the Finnish National Annex for EN 1993-1-1.	5

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					following values should be used: $\bar{\lambda}_{LT,0} = 0{,}4$ β = 0,75. b) For welded double symmetric I-sections with constant cross section the following values should be used: $\bar{\lambda}_{LT,0} = 0{,}2$ β = 1,0. In both cases lateral torsional buckling curve is selected from table 6.5(FI).””” Some general comments: a) It has never been shown to CEN/TC250/SC3 that recommended values are justified. b) On the other hand some test results show that the recommended values are not justified and are on the unsafe side. See also Finnish general comments on lateral torsional buckling above.		

“”””**Table 6.5 (FI)** Selection of lateral torsional buckling curve for cross sections using equation (6.57)

Cross-section (constant cross section)	**Limits**	**Buckling curve**
Rolled double symmetric I- and H-sections and hot finished hollow	h/b ≤ 2 2 < h/b < 3,1	b c

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sections		
Welded double symmetric I-section and H- sections and cold-formed hollow sections	h /b ≤ 2 2 < h/b < 3,1	c d

In all other cases the rules given in 6.3.2.2 should be applied.”””””

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FI52		6.3.2.3(2)	Note	te	In the Finnish NA for EN 1993-1-1 it is stated: “The value f = 1,0 should be used.” Some general comments: a) It has never been shown to CEN/TC250/SC3 that recommended values are justified. b) Compare also clause 6.3.2.2 where the use of factor “f” is not allowed. Why? c) Compare also clause 6.3.2.4 where the use of factor “f” is not allowed. Why? d) Compare also clause 6.3.5.3 where the use of factor “f” is not allowed. Why? e) Compare also Annex BB where the use of factor “f” is not allowed. Why?	Delete the note or give justification.	5
FI53		6.3.2.4(1)		te	Is the factor “f” also applicable, if this method is used?		3, No, f factor is not to be used in this clause

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FI54		6.3.2.4(2)	Note 1 B	te	The method is not logical because: a) The method is based on certain “effective section”, but the definition of the “effective area” is different in the calculation of A_{eff} and I_{eff} b) In the calculation of I_{eff} the influence of web is neglected, which means that A_{eff} and I_{eff} are calculated for different cross-section, which is not logical. Of course the influence of the web to the stiffness is negligible. See also Finnish general comments on lateral torsional buckling above.		3, The formula is sufficiently accurate
FI55		6.3.2.4(1)	Note 1 B	te	In the note it is stated: “For Class 4 cross-sections $i_{f,z}$ may be taken as….” (=- based on the given effective values) - Does this mean, that $i_{f,z}$ may be calculated also otherwise? On the other hand: a) At general level the intention of EN 1993 seems to be that N_{cr} - and M_{cr} - values should be determined based on gross cross-section also in the case of class 4 sections. Is this case the only exception? b) If gross cross-section could be used the formula could be as given below:		3, Yes, it may be calculated otherwise.

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$\frac{k_c \cdot L_c}{i_{f.z}\cdot\lambda_1} = \frac{k_c\cdot L_c\cdot\sqrt{\frac{A_{eff}}{A}}}{\sqrt{\frac{I}{A}}\cdot\lambda_1} = \frac{k_c\cdot L_c\cdot\frac{\sqrt{A_{eff}}}{\sqrt{A}}\cdot\frac{\sqrt{A}}{\sqrt{I}}}{\lambda_1} = \frac{k_c\cdot L_c\cdot\sqrt{\frac{A_{eff}}{I}}}{\lambda_1} = \frac{k_c\cdot L_c}{\sqrt{\frac{I}{A_{eff}}}\cdot\lambda_1}$ => $i_{f.z} = \sqrt{\frac{I}{A_{eff}}}$							
FI56		6.3.2.4(1)B	Note 2B	te	In the Finnish NA for EN 1993-1-1 it is stated: "A limit value $\bar{\lambda}_{c0} = \bar{\lambda}_{LT,0} + 0{,}1$ should be used. 6.3.2.4(2)B, Note B The value $k_{f\ell} = 1{,}10$ should be used. " The recommended value is used in the Finnish National Annex. Therefore, Finland may also accept, if recommended value is changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal. See also Finnish general comments on lateral torsional buckling above.	Delete the clause.	3, The rule has to be revisited/ adapted. The current rule needs national choice to be possible.
FI57		6.3.2.4(3)		te	This clause could be deleted.		3, clause is necessari for applying the rules in the previous clause

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FI58		6.3.3(5)	Note 2	te	In the Finnish NA for EN 1993-1-1 it is stated: "The alternative method 2 should be used, if applicable. The alternative method 1 may be used." Both methods are accepted according to the Finnish National Annex. Therefore, Finland may also accept, if these rules are changed into application rule without national choice. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal.	Change the method(s) to application rule without national choice.	6
FI59		6.3.4(1)		te	In the Finnish NA for EN 1993-1-1 it is stated: "This method may be used, when other methods given in Standard SFS-EN 1993-1-1 are not applicable. In these cases the applicability of the general method should be verified case by case." The limits of the use of this method should be clearly defined. ECCS/TC8 has published some recommendations for the limits many years ago, but those limits seems to be inaccurate and unclear.		4
FI60		7.2.1(1)B		te	It is proposed that recommended values for horizontal and vertical deflections are given for all materials taking into account: 1) Is it possible to give such recommendations in EN 1990 independent of material?	The text of Finnish National Annex, see below:	

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					2) If recommended values are given also the used serviceability load combination is important and should be given (see three possible combination for serviceability load combinations given in EN 1990) 3) At least all parts of EN 1993 should be written using same philosophy - at the moment only in EN 1993-6 some recommended values are given For the information Finnish rules in NA EN 1993-1-1 are given below The key idea in Finnish NA for EN 1993-1-1 is: * values given should be followed if some harm is caused from deflections, but * other values may be used, but they should be given separately for each project in the execution specification It should also be taken into account that deflection is one parameter, which belongs to CE-marking according to EN 1090-1.		3, SLS requirements should be material independent. Reference is made to EN1990. There an opening is given in the NA to EN1990.

“””The final vertical (w_{max}, see Standard SFS-EN 1990) and horizontal deflections due to characteristic load combinations calculated with a static load should not exceed the values in Table 7.1(FI) if some harm is caused by it unless due to type of structure, use or the nature of activity other values are determined to be more suitable. Precamper (w_c, see Standard SFS-EN 1990) may be used for compensation of the deflection of the permanent load unless harm is not caused by it.

Table 7.1 (FI) Serviceability limit states for deflections

Structure	Serviceability limit state for deflection
Main girders: -roofs -floors	 L/300 L/400

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Cantilevers	L/150
Roof purlins	L/200
Wall purlins	L/150
Sheetings: -in roofs, with no risk for accumulation of water or other risk for failure of the roof -in roofs, with risk for accumulation of water or other risk for failure of the roof -when L ≤ 4,5 m -when 4,5 m < L ≤ 6,0 m -when L > 6,0 m -in floors -in walls -cantilevers	 L/100 L/150 30 mm L/200 L/300 L/100 L/100
Horizontal deflection of the structure -1- and 2-storey high buildings -other buildings	 H/150 H/400
L is span H is the height of the building at the point to be checked	
Buildings supporting crane gantry girders, see Standard SFS-EN 1993-6 and its National Annex.	

MB/ NC[1]	Line number	Clause/ Subclause	Paragraph/ Figure/ Table/	Type of comment[2]	Comments	Proposed change	Observations of the secretariat
FI61		7.2.2(1)B		te	See our comment to 7.2.1(1)B In the Finnish NA for EN 1993-1-1 it is stated: "See table 7.1 of clause 7.2.1."	The text of Finnish National Annex, see above.	3, see previous comment

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FI62		7.2.3(1)B		te	More detailed rules and criteria should be given for vibrations of various structures (including steel structures) as follows: 1) Criteria should preferable be given in EN 1990 independent of material – however light weight and heavy floors should be treated differently 2) Additional detailed rules should be given in material related Eurocodes if really needed.	The text of Finnish National Annex, see below:	3, see previous comment

“””2 Design at serviceability limit state

2.1 Scope and notations

(1) According to this guidance acceptability of vibrations for both light and heavy steel-framed floors due to walking can be assessed numerically.

(2) Following notations are used:

a is the calculated acceleration due to the walking of a human being [m/s^2];

x is the largest width or length of the room [m];

b is the width of the floor [m];

b_{eff} is e effective width of the oscillating part of the floor [m];

e = 2,718 is the Napier's constant;

s is the distance between the floor beams [m];

f_o is the lowest fundamental frequency of the floor

l is the length of the floor beams [m];

m is the mass of the entire floor per unit area + the proportion of 30 kg/m^2 of the payload [kg/m^2];

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L is the main girder span [m];

E_l is the reduced elastic modulus corresponding to the length direction l of the floor [N/m^2];

I_l is the calculated bending stiffness per width unit corresponding to the length direction l of the floor [m^4/m];

$(EI)_b$ is the lower stiffness $E_b \cdot I_b$ of the floor corresponding to the width direction b [Nm^2/m];

$(EI)_l$ is the greater stiffness $E_l \cdot I_l$ of the floor corresponding to the length direction l [Nm^2/m];

$(EI)_L$ is the stiffness $E_L \cdot I_L$ of the main floor beams [Nm^2/m];

W is the effective mass of the floor accompanied in the vibration [kg];

P is the weight of a human being, which causes vibration [N];

R is the reduction factor of the acceleration (= 0,7) [-];

δ_0 is a largest total deflection due to the point load of 1 kN [m];

δ_1 is a largest local deflection due to the point load of 1 kN [m];

ζ is the damping ratio [-].

2.2 Limitations of the method

(1) These instructions should be used under the following conditions:

- floor in residential or office buildings;
- the lowest fundamental frequency of the floor is greater than 3 Hz;
- vibration is caused by human walking;
- there are no special requirements for the size of vibrations.

(2) The method should not be used, for example for commercial and sports facilities, where the level of loads and requirements differs from the foregoing, or for rooms, where the vibration

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is caused by machines.

2.3 General

(1) Vibration due to walking can become harmful, when cyclic loading components of walking are strengthened too much due to the resonance phenomenon, if the hit of the heel on the floor causes too big vibration, or if the floor sways too much under steps.

(2) Resonance is considered as determining in the design, if the lowest fundamental frequency of oscillation of the floor is less than 10 Hz. If the frequency is larger, the sway of the floor or vibration is determining in the design. Due to the change of the determining factor there is discontinuity at 10 Hz. Low fundamental frequencies are typical for heavy floors and for light floors with high fundamental frequencies.

(3) Here are instructions for vibration classes of floors and quidance for the vibration study of a rectangular floor. The floor to be studied may also be part of a larger intermediate or base floor (Figure 2.1).

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

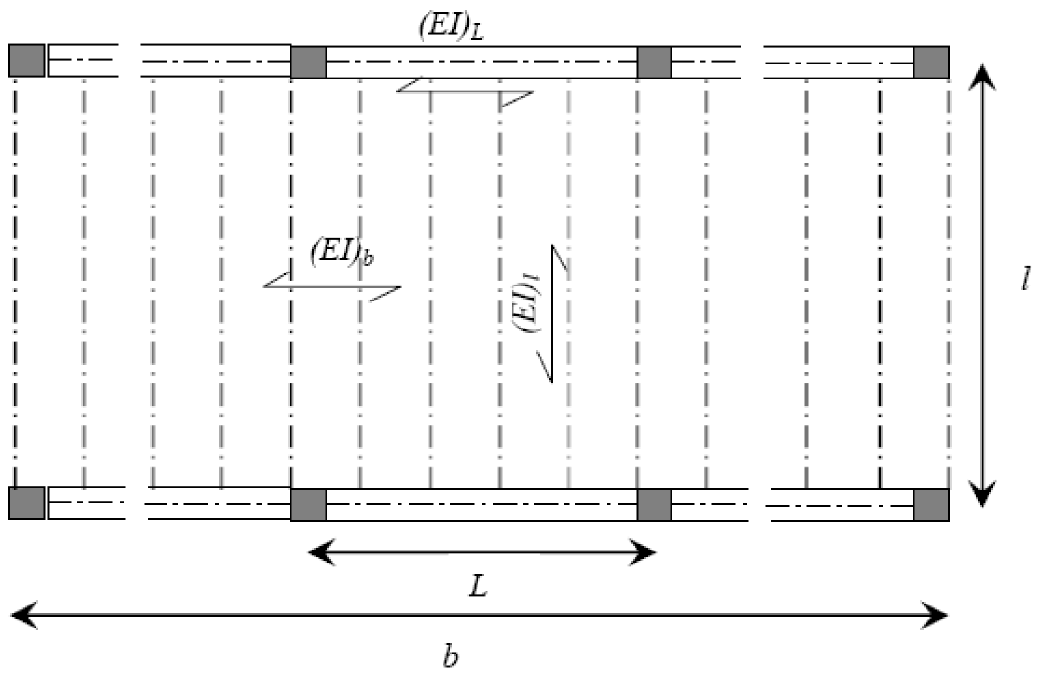

Figure 2.1 Typical floor sub-division, which includes the surface plate, floor beams and main girders

2.4 Vibration criterion

(1) In the design of floor following should be taken into account:

– The total deflection of floor frame structure δ_0 due to the local point load of 1 kN, when the fundamental frequency of the floor is greater than 10 Hz. These floors are called high frequence floors.
– The acceleration *a* of the floor frame structure due to the walking of one person, when the fundamental frequency of the floor is less than 10 Hz. These floors are called low frequency

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floors.

– The local deflection of the surface of the floor δ_1 due to the local load of 1 kN. Local deflection relates to the deflection of the surface structures between the floor beams, to floating floors and raised floors.

(2) Floors are classified into vibrations classes according to table 2.1. The limits for the floor frame structure given in table 2.1 may be increased by a factor:

$$k = \frac{1}{0{,}318 + 0{,}114 \cdot x} \qquad (2.1)$$

when the largest length or width x of the floor is less than 6 m. When x $\geq$ 6 m, the value k = 1,0 should be used. The floor belonging to a particular class shall meet both the criterion for frame of the floor and the criterion for the local deflection.

Table 2.1 shows vibration classes of floors and in table 2.1 recommendation of vibration classes for residential and office buildings.

Table 2.1 Vibration classes of floors

	Criterion for the floor frame		Criterion for local deflection
Vibration class	High frequence floors	Low frequence floors	Both high and low frequence floors
A	$\delta_0 < 0{,}12$ mm	$a < 0{,}03$ m/s^2	$\delta_1 < 0{,}12$ mm
B	$\delta_0 < 0{,}25$ mm	$a < 0{,}05$ m/s^2	$\delta_1 < 0{,}25$ mm
C	$\delta_0 < 0{,}50$ mm	$a < 0{,}075$ m/s^2	$\delta_1 < 0{,}50$ mm
D	$\delta_0 < 1{,}0$ mm	$a < 0{,}12$ m/s^2	$\delta_1 < 1{,}0$ mm
E	$\delta_0 > 1{,}0$ mm	$a > 0{,}12$ m/s^2	$\delta_1 > 1{,}0$ mm

Table 2.2 Recommendation of vibration classes for residential and office buildings

Vibration Class	Scope of the vibration class
A	The normal class for vibration moving from one apartment to another apartment Special class, when the vibration is caused in the same apartment.
B	The lower class for vibration moving from one apartment to another apartment The upper class for residential and office buildings, when the vibration is caused in the same apartment.
C	The normal class for residential and office buildings, when the vibration is caused in the same apartment.
D	The lower class for residential buildings, when the vibration is caused in the same apartment. For example attics at detached houses or holiday homes.
E	Class for which there are no restrictions.

2.5 Fundamental frequency of the floor

(1) The lowest fundamental frequence of a simple four-sided supported rectangular floor is calculated from the expression

$$f_0 = \frac{\pi}{2l^2}\sqrt{\frac{(EI)_l}{m}} \cdot \sqrt{1+\left[2\left(\frac{l}{b}\right)^2+\left(\frac{l}{b}\right)^4\right]\frac{(EI)_b}{(EI)_l}} \qquad (2.2)$$

where l is the length of the floor, $(EI)_l$ is the greater stiffness $(EI)_b$ corresponding to the length direction of the floor and $(EI)_b$ is the lower stiffness corresponding to the width direction b of the floor and m is the mass of the floor per the floor unit area. 30 kg/m^2 of the live load should be included in the mass of the floor.

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

(2) The support conditions of the edges parallel with to the floor beams do not usually have influence to the fundamental frequence. In these cases the fundamental frequency may be calculated from the expression

$$f_0 = \frac{\pi}{2l^2}\sqrt{\frac{(EI)_l}{m}}, \qquad (2.3)$$

Expession (2.3) underestimates the fundamental frequence not more than 5 %, when b/l >1,0 and $(EI)_l/(EI)_b>30$, but if $b/l = 0{,}5$, the same accuracy is achieved only when $(EI)_l/(EI)_b>200$.

(3) If the floor beams (length l) are supported on the main girders (length L = b), the system's lowest fundamental frequency may be calculated from the fundamental frequences of the floor beam and of the main girder by using expression:

$$f_0 = \frac{1}{\sqrt{\frac{1}{f_{0,l}^2}+\frac{1}{f_{0,L}^2}}}, \qquad (2.4)$$

where $f_{0,l}$ is calculated from expression (2.2) and the fundamental frequence of the main girder from the expression:

$$f_{0,L} = \frac{\pi}{2L^2}\sqrt{\frac{(EI)_L}{m}}. \qquad (2.5)$$

Factor $(EI)_L$ is the common bending stiffness of the main girder and the surface slab per unit length.

2.6 Calculation of the total deflection

(1) The total deflection of the floor δ_0 due to the local load of 1 kN should be checked when the fundamental frequence of the floor is greater than 10 Hz.

(2) Deflection is calculated assuming the slab as ortotropic and rectangular and supported on four sides. The deflection of the mid point of the slab due to force of F = 1 kN should be calculated using the formula:

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

$$\delta_0 = \gamma \cdot \frac{Fl^2}{(EI)_l}\text{, where} \qquad (2.6)$$

$$\gamma = \frac{4}{\alpha\pi^4}\sum_i\sum_j \frac{1}{(2i-1)^4 + \beta\left(\frac{2j-1}{\alpha}\right)^4}; \quad \alpha = \frac{b}{l} \text{ ja } \beta = \frac{(EI)_b}{(EI)_l} \qquad (2.7)$$

(3) In many cases the support conditions of the edges, which are parallel to floor beams, do not have influence to the deflection. In this case instead of the expression (2.7) the following expression may be used:

$$\gamma = \frac{1}{42 \cdot \left[\frac{(EI)_b}{(EI)_l}\right]^{1/4}} \qquad (2.8)$$

Difference between the results from expressions (2.7) and (2.8) is not more than 2,5 %, when b/l > 1,0 and $(EI)_l /(EI)_b$ > 20, but if b/l = 0,5, the same accuracy is achieved only when $(EI)_l /(EI)_b$>300.

(4) If the deflection calculated according to the expression (2.6) is greater than the deflection due to the point load F = 1 kN for the beam separated from the floor, the greatest possible deflection calculated based on the separated beam is used as comparative deflection:

$$\delta_{max} = \frac{Fl^3}{48 \cdot s \cdot (EI)_l} \qquad (2.9)$$

where s is the distance between the floor beams.

(5) If the floor beams are supported to the main girders, the deflection of the main girders should be added to the deflection.

2.7 Calculation of acceleration

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

(1) Acceleration of the floor due to walking of one person should be checked, if the fundamental frequence of the floor is lower than 10 Hz. Acceleration should be calculated using the formula:

$$a = \frac{R \cdot P}{W \cdot \varsigma} \cdot 0{,}83 \cdot e^{-0{,}35 f_0} \qquad (2.10)$$

where P = 800 N (weight of the walker), R = 0,7 and e = 2,718. As damping ratio a value ζ= 0,03 may generally be used. ☐If the floor contains a few non-load-bearing structures (partitions, ceilings, ducts, furniture, etc.), the value ζ = 0.02 should be used for the damping ratio.

(2) The effective mass of W, which is taken into account in the vibration calculated of the rectangular floor supported on four edges, should be calculated using the formula:

$$W = m \cdot b_{eff} \ l \text{, where} \qquad (2.11)$$

$$b_{eff} = 2{,}0 \cdot \left[\frac{(EI)_b}{(EI)_l} \right]^{1/4} \cdot l \qquad (2.12)$$

but b_{eff} should not be more than of 2 / 3 of the total width of the floor in transversal direction to the floor beams.

If a rectangular floor is unsupported on one edge parallel to the floor beam, instead of coefficient 2,0 coefficient 1,0 is used in the formula (12FI).

(3) If the floor beams (length l) are supported on the main girders (length L), the effective mass to be taken into account in the vibration calculation should be determined using the formula:

$$W = \frac{W_l}{1 + f_{0,l}^2 \big/ f_{0,L}^2} + \frac{W_L}{1 + f_{0,L}^2 \big/ f_{0,l}^2} , \qquad (2.13)$$

where W_l is obtained from the expressions (2.11) and (2.12). Factor

$$W_L = m \cdot l_{eff} \ L \text{, where} \qquad (2.14)$$

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

$$l_{eff} = 1{,}6 \cdot \left[\frac{(EI)_l}{(EI)_L} \right]^{1/4} \cdot L \qquad (2.15)$$

but l_{eff} should not be more than of 2 / 3 of the total width of the floor in transversal direction to the main girders. If the main girder is located on the free edge of the floor the floor stiffness *(EI)*$_L$ should be reduced by 50 percent.

2.8 Evaluation of the local deflection

(1) Local deflection δ_1 relates to the deflection of the slab between the floor beams, floating floors and increased floors. Local deflection relates to the difference of deflections between deflection at the location of the point load of 1 kN and deflection at the distance of 600 mm (Fig. 2.2). The deflection of the floor beam needs not to be taken into account in the calculations.

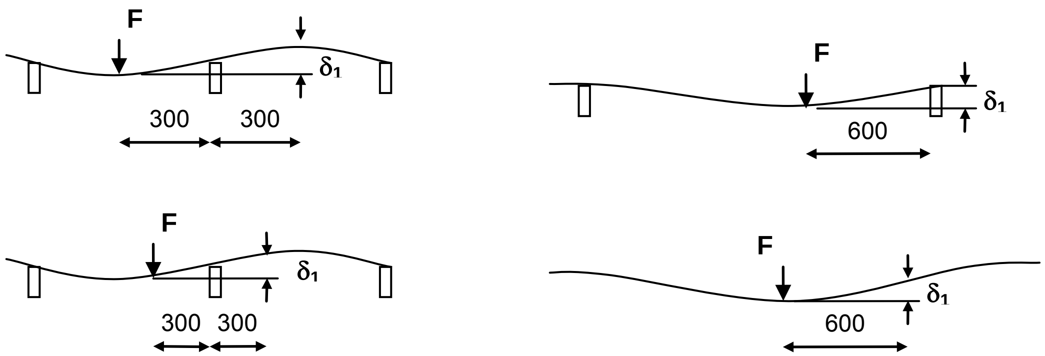

Figure 2.2 Examples of the deflection of the surface structure of the floor”””””

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
FI63		Annex A and Annex B	General	te	Application rules for M_z-M_y- N-interaction are missing at least for the following cases needed in practice: 1) I-profiles with only one axis of symmetry 2) Angle sections 3) Channel sections		ad 1) 5 ad 2) 4 ad 3) 4
FI64		Annex A (informative)	General	te	In the Finnish Annex it is stated: "Annex A may be used." Informative annexes should not be used at all in the revised EN 1993, because some users think that informative annexes need not to be followed at all.		6
FI65		Annex A		te	According to /1/ for method 1 it should be $w = w_z$ =1 in class 3 and class 4. If so, it should be given also in EN 1993-1-1. /1/ ECCS Publication No. 119, Rules for Member Stability in EN 1993-1-1. Background documentation and design guidelines. ECCS Technical Committee 8 – Stability. 2006, 259 p.		3, These values are not used for class 3 and 4.
FI66		Annex A (informative)		te	According to /1/ for method 1 it should be $C_{yy} = C_{zz}$ = 1 and $C_{yz} = C_{zy}$ =0.6 in class 3 and class 4. If so, it should be given also in EN 1993-1-1.		3, These values are not used for class 3 and 4.

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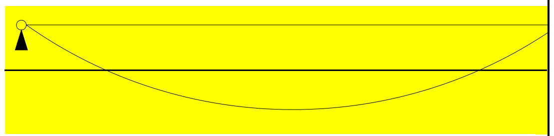
					/1/ ECCS Publication No. 119, Rules for Member Stability in EN 1993-1-1. Background documentation and design guidelines. ECCS Technical Committee 8 – Stability. 2006, 259 p		
FI67		Annex A (informative)	General	te	In the definition of n_{pl} the value γ_{M0} is used. It should be checked if γ_{M0} or γ_{M1} should be used in the case of M-N-interaction.		3, This was corrected in amendment of 2009
FI68		Annex B (informative)		te	Method 2 according to Annex B of EN 1993-1-1 should also be applied for circular structural hollow sections.	Add circular structural hollow sections to this annex.	5
FI69		Annex B	Table B.3	te	Simple beam as example:  a) When calculating with the middle moment figure (in table B.3), we get a_s = indefinite, in the other words $a_s = 1$ and $\psi = 0$ and Cm= 1. b) When calculating with the lower moment figure (in the Table B.3), we get a_s = indefinite, in the other words $a_s = 0$ and $\psi = 0$ and Cm= 0.95. Which formula should be used for calculating C_m ,when end moments are zero?		5

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					Same result should be as outcome independent which formula is used.		
FI70		Annex AB (informative)		te	In the Finnish Annex it is stated: “Annex AB may be used.” <u>Informative annexes</u> should not be used at all in the revised EN 1993, because some users think that informative annexes need not to be followed at all. It is fully supported what is stated in Note 2: “This annex is intended to be transferred to EN 1990 in a later stage.”	Change informative annex into normative annex or preferable transfer rules into EN 1990, but as normative annex or as application rules without NDP`s	2, Consider AB.1 to be deleted and AB.2 to be moved to EN 1990
FI71		Annex BB	2.1(1)B	te	If profiled steel sheeting is laterally continuously supporting a beam or an upper chord of lattice girder, then for which forces joints (connection and fasteners) should be designed for, at normal temperature and at fire fire situation? Is the clause 6.3.5.2(3)B applicable also in the case, when beam is not designed according to plastic theory. Compare also clause 10.1.1(6) of EN 1993-1-3.		4
FI72		Annex BB (informative)		te	In the Finnish NA for EN 1993-1-1 it is stated: “Annex BB may be used.” <u>Informative annexes</u> should not be used at all in	Change informative annex into normative annex	4

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					the revised EN 1993, because some users think that informative annexes need not to be followed at all.		
FI73		BB.1.3(3)B		te	Additional information is not given in the Finnish National Annex. Therefore, Finland may also accept, if the note is deleted. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal.	Delete the note.	2
FI74		BB.1.3(3)B	Note	te	Additional information is not given in the Finnish National Annex. Therefore, Finland may also accept, if the note is deleted and changed to application rule.. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is also an argument for our proposal.	Delete the note and change it to application rule.	2
FI75		Annex C	C.1.2(2) NOTE 2		There exists a reference to EN 1090-2 to use EXC2 if no execution class is specified. EN 1993-1-1 Annex C is normative Annex which should be used to select proper execution class. Clause C.1.1(1)P requires to select the execution class. Is the NOTE 2 needed here? If EN 1090-2 is revised, it is not known if the text is still		1

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					included in EN 1090-2. If the NOTE 2 is necessary to keep here, maybe reference to EN 1090-2 should be changed to version EN 1090-2+A1:2012.		
SE1		1.2.2		ed	Some EN-standards are missing from the list, for example EN-standards related to dimensions and tolerances of some rolled profiles, see EN 1090-2 section 5. Also standards EN 10149-1, -2 and -3 should be added, see comments later on.		1 see FI3
SE2		2.3.2(1)		te	This clause should be modified taking into account: 1) This clause seems to be in conflict with some clauses of section 3, where NDP`s are allowed for materials and material properties. 2) Also national technical approvals should be allowed. 3) ISO-standards and EN-ISO standards should also be allowed. On the other hand it should also be kept in mind, that general trend seems to be that many EN-standards will be changed into EN- ISO standards. 4) At EU-level it has been decided that national approvals given in countries belonging to European Economic Area are acceptable.		4, see FI5

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					5) Is the wording “other construction product” really needed or should it be “other construction product made of steel”? The scope of EN 1993-1-1 is the design of steel structures, therefore why to give rules of “other construction product”. Maybe the intention is to say something of “other steels”. 6) See also EN 1090-2, where also other steels may be accepted if they are defined. This actually means that EN 1993 and EN 1090 are in contradiction with each other, which is not generally acceptable. 7) Also the terminology used EN 1993 and EN 1090 seems to be different, which should also be harmonized. One example: Expression “constituent product” is used in EN 1090-2, but not in EN 1993.		
SE3		2.4.2(1)		te/ed	Replace “hEN” by “EN”. Most of the relevant standards are “EN” and not “hEN”.	Replace “hEN” by “EN”.	1 see FI6
SE4		2.5(1)		te	The clause (1) is probably not true in all cases, which will be illustrated with two examples:	Delete the clause.	

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					1) Formula (6.3) is based on studies made inthe beginning of 1930 and those testresults are not analyzed according to Annex D of EN 1990.2) Formula (6.68) has been developed in USA much before Annex D of EN 1990 was published.It is proposed to delete this clause. Other arguments: a) The users of EN 1993 are not interested onhow different rules have been developed. b) This kind of information belongs to background documents, not into standards. Some other comments: a) It is important to say that when new rules are developed in the future then Annex D of EN 1990 should be followed, but this kind of ruleshould be given in EN 1990.		2, see FI7

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SE5		2.5(2)		te	The clause 2.5(1) is probably not true in all cases. It is proposed to delete this clause (2). See also comments to 2.5(1)	Delete the clause.	2, see FI8
SE6		2.5(2)	Note 1	te	Note 1 should be reformulated. One proposal is on the right hand side.	(x) When new rules are developed based on testing the 5% - fractile should be used.	2, see FI9
SE7		2.5(2)	Note 2	te	The note is self-evident and shall be deleted. If not deleted, then similar reference should also be made to EN 1993-1-3, EN 1993-1-5, etc.	Delete the note.	2, see FI10
SE8		2.5(2)	Note 3	te	The note is self-evident and shall be deleted. If not deleted, then similar reference should also be made to EN 1993-1-3, EN 1993-1-5, etc.	Delete the note.	2, see FI11
SE9		2.5(3)		te	The use of testing for the design should be self-evident and therefore this clause could be deleted totally. There are however some technical issues: a) EN 1993-1-3 gives detailed rules for testing, which are in conflict with annex D of EN 1990 in some details. The	Delete this clause.	2, see FI12

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					question in this case is if rules in EN 1993-1-3 or rules in Annex D of EN 1990 should be used in practice. b) Also EN 1993-5 gives some rules for testing, which are overlapping with rules given in EN 1993-1-3.		
SE10		3.1(1)		te	The wording should be changed as proposed on the right hand side. Arguments: See comments to 2.3.2(1)	(1) The nominal values of material properties given <u>in the applied standard</u> should be adopted as characteristic values in design calculations. (2) If other steels than mentioned in clause (1) are used their material properties should be known and be determined according to relevant EN-testing standards.	3, see FI13 for motivation
SE11		3.1(2)	Note	te	In the Swedish NA for EN 1993-1-1 it is stated: Steel grades according to table E-1 may also be used.	Add EN 10149-2 and EN 10149-3 into 1.2.2 and all other relevant clauses of various parts of EN 1993, for example EN 1993-1-1, EN 1993-1-8, EN 1993-1-10, EN 1993-1-2. Include table 1 and 2 in EN 1993-1-12 in EN 1993-1-1. Delete the note and add application rule <u>without NDP</u> as follows:	

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<table>
<tr><th>MB/ NC[1]</th><th>Line number (e.g. 17)</th><th>Clause/ Subclause (e.g. 3.1)</th><th>Paragraph/ Figure/ Table/ (e.g. Table 1)</th><th>Type of comment[2]</th><th>Comments</th><th>Proposed change</th><th>Observations of the secretariat</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Tabell E-1 Stålsorter
<table>
<tr><th>Standard</th><th>Stålsort</th><th>f_y MPa</th><th>f_u MI</th></tr>
<tr><td>EN 10149-2[a]</td><td>S 315MC</td><td>315</td><td>39</td></tr>
<tr><td></td><td>S 355MC</td><td>355</td><td>43</td></tr>
<tr><td></td><td>S 420MC</td><td>420</td><td>48</td></tr>
<tr><td></td><td>S 460MC</td><td>460</td><td>52</td></tr>
<tr><td>EN 10149-3[a]</td><td>S 260NC</td><td>260</td><td>37</td></tr>
<tr><td></td><td>S 315NC</td><td>315</td><td>43</td></tr>
<tr><td></td><td>S 355NC</td><td>355</td><td>47</td></tr>
<tr><td></td><td>S420NC</td><td>420</td><td>53</td></tr>
</table>
[a] Stålen bör beställas med provning av slagseghet enligt EN 10149-1 a
Option 5.

[a] the steel should be ordered with test of fracture toughness according to EN 10149-1, section 1, Option 5.

Additional steel grades are given in EN 1993-1-12.</td><td>(2) If other steels than mentioned in clause (1) are used their material properties should be known and be determined according to relevant EN-testing standards.</td><td>3, see FI13 for motivation</td></tr>
<tr><td>SE1 2</td><td></td><td>3.2.1(1)</td><td>Note</td><td>te</td><td>Is it acceptable also in the future that different mechanical properties and different thickness limits are given in table 3.1 than in the material standard?</td><td>Delete Table 3.1 or change it to conform with the material standards.</td><td>3, see previous comments</td></tr>
<tr><td>SE1 3</td><td></td><td>3.2.2(1)</td><td>Note</td><td>te</td><td></td><td>Make the note as application rule without national choice. (at least up to steel grade S460).</td><td>3, see previous comments</td></tr>
<tr><td>SE1 4</td><td></td><td>3.2.2
and</td><td>General comment</td><td>te</td><td>The problem is that there are many steel grades which do not fulfil all of these three rules.</td><td></td><td>4, see FI17</td></tr>
</table>

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		5.5.2			Perhaps a more logical approach should be considered: give the required ductility rules based on cross-section classes 1, 2, 3 (and 4), not based on steel grades.		
SE1 5		3.2.3(3)B	Note B.	te		Add as application rule without any national choice: σ_{Ed} = 0,25 $f_y(t)$ should be used for building component under compression.	2, see FI19
SE1 6		3.2.4(1)	Note 3B Table 3.2	te		Change the note 3B into application rule <u>without any national choice</u> as follow: The table 3.2 should be applied for all steel structure covered by EN 1993.	2, see FI20
SE1 7		5.2.1(3)	Formula (5.1)	te	The use of this formula may need restrictions. It is not very accurate in many cases. More detailed recommendations are welcomed.		1, see DE12 and FI25
SE1 8		5.2.1(5)		te/ed	It is proposed that rules given in EN 1993-1-5 dealing with global analysis (dealing with shear lag) are transferred to EN 1993-1-1/Section 5.	All rules for shear lag dealing with <u>global analyses</u> should be given only in one place, preferable in EN 1993-1-1/Section 5. Also the rules dealing with the	5, see FI28

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						determination of resistance in the case, when shear lag should be taken into account, should also be given only in one place (either in EN 1993-1-1 or in EN 1993-1-5).	
SE19		5.3.2(3)	Note	te		Delete the note and give it as application rule without national choice.	4, see FI31
SE20		5.3.2(5)B	Figure 5.3	te/ed	The figure 5.3 in unclear: - on the left hand side the angle is Ø/2 and on the right hand side Ø - clarification of the meaning is needed, clarification to the figure 5.3 is needed In our understanding the aim has been that the meaning of figure 5.1 (+ relevant text) of EN 1993 and figure 5.1 (+ relevant text) of EN 1992 should be same - however figures, notations and wording are different in EN 1992 and in EN 1993, maybe the outcome is same if correctly understood.	Change the figure, notation and wording to same in EN 1992 and EN 1993 (at least in EN 1992 and EN 1993)	4, see FI33
SE21		5.3.2(11)	Note 2	te	The method in 5.3.2(11) is questionable. The general aim in the revision on EN 1993 (including all Eurocodes) is the reduction of the number on NDP`s, which is one argument for our proposal.	Delete clause 5.3.2(11).	3, see FI34 for motivation

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					On the other hand there is no need to give various alternatives in standards.		
SE2 2		5.5.1	Table 5.2	te	For structural hollow sections the notation *c* should be defined as given in clause 4.4(2) of EN 1993-1-5.		2, see FI37
SE2 3		6.2.3(1)		te/ed	In this clause (compare also some other clauses of EN 1993-1-1) general condition $E \leq R$ is given. For example formula (6.5). This is a general requirement given in EN 1990 and need not be repeated all the time.	The EN 1993 should only give the resistance.	1, see FI42, To be formulated as unity check
SE2 4		6.2.3(2)	Formula (6.7)	te	The question is, if the coefficient 0,9 is still needed in the formula (6.7) or not? WG EN 1993-1-12 have proposed an amendment on EN 1993-1-1 (AM-1-12-2014-01) suggesting that the factor 0,9 should be changed to 1,0 based on an evaluation by Dr Primoz Moze, University of Ljubljana. 1) Compare formula in the table 8.1 (rivets) of EN 1993-1-3, where coefficient 0.9 is not used. 2) Compare formula in the table 8.2 (self-tapping screws) of EN 1993-1-3,		6, see FI45

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					where coefficient 0.9 is not used. 3) Compare formula in the table 8.3 (cartridge fired pins) of EN 1993-1-3, where coefficient 0.9 is not used. 4) Compare formula in the table 8.4 (bolts) of EN 1993-1-3, where coefficient 0.9 is not used, but different formula for reduction factor is given and the maximum value is as given in table 8.4 of EN 1993-1-3. 5) EN 1993-1-3 covers cold-formed components made of steels up to 15 mm, for example cold-formed components made of steels according to EN 10025. The key question is: Why the tension resistance of the net section if different depending on if the member itself is made by welding or by cold-forming, but the steel itself is same. Clarification and harmonization is needed.		
SE2 5		6.2.8(5)		te	There seems to be inconsistencies between formulas (6.29) and (6.30) and in the determination of A_w . Formula (6.30) give better result for rolled and welded profiles, because A_w is lower		6, see FI47

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					than A_v. A_v is needed in the calculation of $V_{pl.Rd}$. In the calculation of A_v for rolled profiles A_v include the flange and a part of "rounding". The question is: Should the shear resistance to be calculated by using A_w, when the formula (6.30) is used?		
SE2 6		6.3.1.2(2)	Table 6.2	te	For welded box sections given conditions are: "Thick welds: $a > 0{,}5t_f$ $b/t_f < 30$ $h/t_w < 30$" Should all of the conditions be fulfilled at the same time? 1) If so, add "All conditions should be fulfilled at the same time" 2) If not give clarification.		2, see FI49
SE2 7		6.3.2.4(3)		te	This clause could be deleted.		3, See FI57 for motivation
SE2 8		6.3.3		te	In Eurocode 3, Part 1-1 two methods are given for the design of beam-columns. They have been criticized for their complexity. Furthermore, internal plastic redistribution of stresses of class 3 cross-sections is not utilized in the code. These		

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					shortcomings were resolved in proposal for amended rules in [1], however, the procedures for beam-columns are still very complicated and difficult to understand for the users and for teachers. The design method for members in compression and bending given in Eurocode 9, Part 1-1 for aluminium structures have been shown to give very similar result as the methods in Eurocode 3, Part 1-1 for steel structures, especial if the proposals in [1] are adopted. However, for the user the methods are very different. In the Eurocode 3 formulations, you need (in the current Eurocode 3 two sets of) rather complicated interaction factors which depend on the bending moment distribution and the class of the cross-section. In Eurocode 9, one variable ω_x cover every moment distribution, and exponents in the interaction formulae account for the influence of local buckling and plasticity. In Eurocode 3 you calculate the effective cross-section for combined state of stress which may vary along the column and is different for different load combinations; in		5 See SC3 document N1898

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					Eurocode 9 you calculate cross-section properties for moment and axial force separately. In Eurocode 9 there is no jump in the resistance between different classes of cross-sections. The formulation of Eurocode 9 is easier to understand, still more general. The method is already proposed to be included in Eurocode 3, Part 1-3 for cold-formed structures. [1] Greiner, R. et al (2011). Design guidelines for cross-section and member design according to Eurocode 3 with particular focus on semi-compact sections. Valorisation Project: SEMI-COMP+, Research Programme of the Research Fund for Coal and Steel – RTD, 2011 See also: Höglund, T. and Tindall, P, Designers Guide to Eurocode 9: Design of aluminium Structures. ICE Publishing 2012		
SE2 9		6.3.4(1)		te	In the Swedish NA for EN 1993-1-1 it is stated that the method can be used with the use of the following interpolation rule:		

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					$\bar{\chi} = \frac{n\chi + m\chi_{LT}}{dm + n}$ där $n = \frac{N_{Ed}}{N_{Rk}}$ och $m = \frac{M_{y,Ed}}{M_{y,Rk}}$ The use of the method could be benefited if the limits of the use of the method should be more clearly defined. ECCS/TC8 has published some recommendations for the limits many years ago, but those limits seems to be inaccurate and unclear.		4 See also DE comment for 6.3.4
CZ1		5.2; 5.4		te, ed	Clauses dealing with conditions for global analysis are disorganized and not clear. Elastic global analysis (5.4.2) is hidden under 5.4. (material non-linearity) etc.	Come back to similar arrangement as in ENV-1993-1-1 (of course, improved)	3, But clarification of chapter 5 is needed.

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Which clauses would benefit from improvements in clarity?							
FR17		5.2		te	Regarding the different options for the structural analysis, the section 5 of EN 1993-1-1 is often difficult to understand.	Add a flowchart like the one of figure 50 given ECCS publication n°119.	2
FR18		5.3.2	Table 5.1	te	The titles of columns 2 and 3 should be clarified.	Replace « Elastic analysis » by « Elastic analysis and elastic resistance » Replace « Plastic analysis » by « Elastic or plastic analysis and plastic resistance »	1, see DE20
FR19		5.3.2	(6)	ed	The expression (5.8) is quite complicated while an equivalent and simpler condition can be given.	Replace the formula (5.8) by: $N_{Ed} / N_{cr} > 0{,}25$	2, see FR2
FR20		5.3.2	(11)	te	The use of this method is very complex for a practitioner. Firstly, the field of application should be clearly defined: stability of plane structures loaded in its plane? Secondly, the methodology should be better described: - How to choose the eigen-mode? - What is the critical section? - For which cross-section does the designer select the buckling curve?	Remove clause (11). If the method is kept in EN 1993-1-1, clarify the field of application and the procedure.	6, see GR7

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					- Etc.		
FR2 1		5.5.2	Table 5.2	te	In sheet 1, give a simple expression of the parameter α for the very common case in practice, i.e. I or H symmetric cross-section under axial force and bending moment about the strong axis.	For a I or H symmetric cross-section under axial force N_{Ed} and bending moment $M_{y,Ed}$ about the strong axis, the parameter α may be calculated as follows: If: $N_{Ed} < -c\ t_w\ f_y$ $\alpha = 0$ If: $N_{Ed} > c\ t_w\ f_y$ $\alpha = 1,0$ Else: $\alpha = 0,5\ [1 + N_{Ed} / (c\ t_w\ f_y)]$ N_{Ed} is positive for compression.	6
FR2 2		5.5.2	Table 5.2	te	Sheet 3/3: There is a strong inconsistency for circular hollow sections, between the limits given in this table and the buckling criteria for shells under meridian stresses, given in EN 1993-1-6.	No proposition is available at the present time.	6
FR2 3		6.2.7	(1)	te	The criterion (6.23) refers the design resistance to torsion but it is defined nowhere in Eurocode 3.	Remove this criterion and replace it by a simple rule: "The general approach consists in checking that the Von Mises equivalent stress, calculated from the stresses induced by the different internal forces, bending moments and torque, does not exceed the design yield strength in any point of the cross-section. In case of class 4 cross-sections, the normal stresses should be calculated using effective properties of the cross-section."	6
FR2 4		6.2.8	(3) et (5)	te	It is necessary to clarify the field of application of these clauses. Is it acceptable to refer to plastic resistance of the cross-section for M-V interaction, whatever the class is?	No proposition. Results of some research works are expected on this topic.	6
FR2 5		6.2.8	(5)		The expression of the moment resistance $M_{V,Rd}$ is in contradiction with the principle to consider a reduced yield strength for the shear area A_v in (3), while the area is A_w in the formula.	No proposition.	6, see FI47

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FR2 6		6.3.1.2	(4)	te	The condition $N_{Ed}/N_{cr} \leq 0,04$ is not clear on the fact to consider it in the verification of a member under axial force and bending. Does it mean: $\chi = 1,0$?	The condition $N_{Ed}/N_{cr} \leq 0,04$ should apply to members under pure compression only.	2
FR2 7		6.3.2.2	(4)	te	The condition on M_{Ed}/M_{cr} is not clear on the fact to consider it in the verification of a member under axial force and bending. Does it mean: $\chi_{LT} = 1,0$?	The condition on M_{Ed}/M_{cr}. should apply to members under bending only.	2
FR2 8		6.3.4	(1)	te	The field of application of the method should be better defined. For example, the U-profiles (UPE) under axial force and bending about the strong axis should be out of the scope of the general method.	- Single members with cross-section symmetric about the plane of bending, built-up or not, uniform or not, subjected to axial force and/or bending moment about the strong axis of the cross-section, with complex support conditions or not, or - Plane frames or sub-frames composed of such members under internal forces and moments in the plane of the frame. The members should not contain rotated plastic hinges.	4
FR2 9		6.3.4	(2)	ed	The criterion (6.63) may lead to errors since, in the Eurocodes, the resistance condition is generally presented as a ratio that should be lower than 1,0 but, for this criterion, it must be higher than 1,0! Therefore the condition should be reversed. This will improve the readability of the criterion, for example in comparison with the criteria (6.61) and (6.62) where the reduction factor is located at the denominator. This modification will make the standard more homogeneous, especially in the presentation of the results of a software.	Replace the expression of (6.63) by: $1 / (\chi_{op}\ \alpha_{ult,k} / \gamma_{M1}) \leq 1,0$	1
RO1 1		6.3	6.3.2	ed	The relation for calculation of M_{cr} .	The relation for calculation of M_{cr} should be either reintroduced in the code or reference should be made to a very precise publication,	3, No text book material in the code

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						for instance a specialised NCCI or a certain book. All terms in an equation should be either given in the code or in clearly expressed recognised documents (NCCIs, books etc.).	An ECCS publication is already planned
RO1 2		6.3	6.3.3	ed	A single, simple and conservative approach should be given in the code for members in compression and bending and more competitive alternatives could be given in Annexes.	If Annex A was kept, simpler formulations should be used for the factors that are involved.	6 See also German comment DE 6.3.3(4)
GB6		Clause 6.2.1(5)		te	The yield criterion – does not say if the shear stress in the formula should allow or not for shear stress coming from torsion (e.g hollow sections)		3, The yield criterion is formulated and valid generally It is therefore valid for all kinds of load combinations, also if torsion is present.
GB7		6.2.8(3)		te	The clause currently refers only to "design resistance" which implies an elastic resistance for class 3 sections and a plastic one for class 1 and 2 sections. However use of an elastic resistance for class 3 sections is incompatible with the approach taken for shear-moment interaction in EN 1993-1-5.	After "should be taken as" add "plastic". At the end of the sentence add a new sentence: "For Class 3 cross sections, the resulting resistance should not be taken as greater than the elastic bending resistance".	4, Comment and proposed change need clarification
GB8		Section 6.3.2			The determination of Mcr causes a number of problems. In general reference has to be made to NCCI. However it is not always clear as to what assumptions have been made with respect to restraints and position of load. It would be far better and more efficient if advice is provided in the Eurocode itself		3, No text book material in the code. Also see RO11.
GB9		Section 6.3			There is no clear advice as to the strength / stiffness that is required to restrain against buckling. EN 1993-1-1 suggests 1%, this would not be considered adequate in typical UK practice. Better guidance is required.		4

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DE3 2		0, 1-4, 5, 6.1-6.4			No additional comments on clarity other than those given above with the technical points. See the previous comments.		No comment
DS/ DK2		3.1	Table 1	te		The existing EN steel material standards for sections should be included and/or added. The existing EN steel material standards for cast steel as well as wrought iron should be included. A guidance of how to use other steel materials (ASSHTO, JIS, ..) should be added.	4
DS/ DK3		6.3.2.3	Formula (6.57) and (6.58)	te	The supplementary factor "f" the moment curve should be deleted – see formula (6.58). This factor takes into account, that the formula (6.57) does not sufficiently fit the real behaviour of a beam sustained to lateral torsional buckling.	The buckling curve should be changed to fit with the lateral torsional buckling capacity.	5
DS/ DK4		6.3.3	Formulae (6.61) and (6.62)	te	The formulae are hiding the essential physical meaning of the stability of columns affected by bending. We have received a lot of questions concerning the physics of the stability problems, as the essence is the supplementary bending caused by deflection of a column due to the normal compression load on the column. This behaviour cannot be deducted by reading the formulae.	Change the formulae to a combination of a normal "stress" plus the bending "stresses" multiplied by factors taking into account the form of the moment curves as well as the supplementary 2th order deflection. The factors could also take into account the plasticity for class 1 and 2 sections.	5, formulae based on internal forces, see SC3 document N1898
GR1 4		5.2.1 (1)		te	The internal forces and moments may generally be determined using either: first-order analysis or second-order analysis, or by amplifying the internal forces from first-order analysis by suitable factors. The third method is not referred to in 5.2.1(1) but is then proposed in 5.2.2.	It must be defined with clarity that the third method is an approximate method which is applicable if the structure fulfills specific criteria.	3, This is already clear from including clause 5.2.2(5).
GR1 5		5.2.1(2,3)		te	It must be clearly defined when second order analysis has to be carried out. The general criterion of 5.2.1(3) is rather vague and may be too conservative for several types of structural systems.	Improved criteria for the choice of the suitable analysis method must be proposed for different types of structures. EC3 provides such a criterion only for	1, see DE12

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						single storey frames 5.2.2 (5).	
GR16		5.2.2(3) and 5.2.2(7)		Ge	Clause (3) is very generally written. Clause (7) clarifies the meaning of (3).	Clauses(3) and (7) should be combined into a single paragraph.	4
GR17		5.3		te	There is a need to clarify the cases where global and local imperfections should be considered	Clarification/simplification of the need to consider global and local imperfections in buildings	4
GR18		5.3.2(5)B	Fig. 5.3	Ed	The meaning of Fig. 5.3 should be better explained within the context of Par. 5.3.2(5)B.	Explain the two cases depicted in Fig. 5.3	2
GR19		6.3.1.1(4)			Does this clause mean that holes for fasteners at other locations than column ends need to be taken into account in A and A_{eff}? If so, it should be explicitly stated, also indicating that A_{net} should be used.	Clarify this clause.	2
GR20		6.3.3 (4)	Note 1	Te	Complexity in the definition of interaction factors k_{yy}, k_{yz}, k_{zy} and k_{zz} and in the appropriate alternative method for plastic behaviour.	Simplify interaction factors by Graph or offer better guidance for the application of each alternative method.	5
GR21		BB.1.1 and BB.1.2		te	EN 1993-1-1 provides rules for buckling lengths, while EN 1993-3-1 for effective buckling factors. There is a need for harmonization.	Harmonize with EN 1993-3-1	4
GR22		BB3.1.1			Definition of C_1. Literature is not provided.	Specify the recommended literature.	4, also see new German comment about BB.3
GR23		6.2.5	Par. 4,5,6	te	If the holes should be accounted for, it is not clarified how the resistance should be obtained, especially in the case of staggered holes.	Clarify how the resistance is affected by hole deduction. For staggered holes propose a suitable procedure.	4
GR24		6.2.8(5)		ge	The alternative formula given for I -cross sections	The wording should be modified to clarify that this	6

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					with equal flanges is actually the same formula as in 6.2.8(3) but applied for this specific type of cross-section.	is not an alternative way of calculation but a simpler expression of the formula in 6.2.8(3).	
GR2 5		6.3.2.2	Table 6.4	te	It is not clarified which cross sections are included under “other cross sections”.	Specify which cross sections are included in the phrase “other cross sections”.	4
GR2 6		6.4.1		te	It is implied that the formulas are applicable to all cases of simply-supported built-up members. However, in equation (6.69) the 1st order bending moment M_{Ed}^{I} appearing at the middle of the member is inserted. There are cases that the maximum bending moment does not appear at the middle of simply-supported members.	Clarify whether the formulas can be applied to all simply-supported members regardless of wether they are mostly stressed at mid-height.	4
PL2					Proposed general/technical change refers to the calculation of buckling reduction factors (i.e. χ , χ_{LT})		No comment
FI76				General	In these Finnish comments line number has not been given mainly due to the following reasons: -CEN has not defined how the line number should be calculated ***from the beginning or from the end of the standard ***form the top or the bottom of the page ***from the beginning of section, clause or subclause -We assume that people giving answers to these comments are clever enough to understand if the reference is made for example to clause 1.2.3.4(5)		No comment
FI77				General	General Finnish comments to **all Parts** of EN 1993.		No comment

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FI78		General		te/ed	General Finnish comments to all parts of EN 1993: Informative annexes should not be used at all in the revised EN 1993, because some users think that informative annexes need not to be followed at all. - it is prosed, that informative annexes are changed into normative annexes (including NDP`s as needed) or deleted - generally standardization means "to agree on something", in most of the cases informative annexes contain issues on which agreement has not been achieved and therefore informative annexes have almost nothing to do with standardization – in order to avoid any misunderstanding most of the informative annexes are very useful also from the practical point of view and also from the point of view of writing National Annexes - see Finnish comments to various parts of EN 1993	Change informative annexes into normative annex or delete informative annexes	3, Informative annexes should be avoided but are sometimes necessary.
FI79		General		te/ed	B-rules (for buildings) should be avoided as far as possible, most of those rules are more general	Delete "B" from B-rules. B-rules should be applicable also for other structures than buildings.	4
FI80		General		te/ed	P-rules should not be given in EN 1993 at all, all needed P-rules are possible to give in EN 1990 and/or EN 1991 in general form independent of material	Delete all P-rules from EN 1993 and check that EN 1990 covers all needed P-rules	3, Depends on general Eurocode policy, TC250

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FI81		General		te/ed	The design (service) life of the structure should be determined separately for each project and given in the execution specification and not in National Annexes due to the following reasons: a) the owner of the structure should have the right to determine the design life of his property (structure) b) therefore this issue does not belong to National Annex and not to the authority - of course authorities could have a right to give some minimum values	Change all rules for the design life on such a way that the determination of the design life time belong preferably to the owner of the structures, not to National Annex and the authority	3, This concerns clause 2.1.3 and the request should be treated at a general EC level, TC250
FI82		General		te/ed	Various parts of EN 1993 include some guidance of the design life of the structures, which is not bad at all, but: a) On the other hand EN 1990 gives some guidance for the choice of the design life and therefore all guidance should be collected into one place, that is: in EN 1990. b) The present rules and recommendations in various part of EN 1993 are different – they should be harmonized if some rules remains in the revised EN 1993 – see comments for various parts of EN 1993 and proposals above c) Also the wording should be same: “The design (service) life” or “The design life”	a) All rules dealing with the design life time should be given only in one place b) At least various parts of EN 1993 should be harmonized between each other.	3, see FI81 for motivation
FI83		General		te/ed	Construction products regulation CPR305/2011 has come into force. EN 1993 (parts) exists reference to CPD, which should be changed.		1, to be harmonized with other Eurocodes

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					ETAG is not anymore known by CPR. There may be also many other changes which should be made to be consistent with CPR.		
SE3 0		General		te/ed	P-rules should not be given in EN 1993 at all, all needed P-rules are possible to give in EN 1990 and/or EN 1991 in general form independent of material	Delete all P-rules from EN 1993 and check that EN 1990 covers all needed P-rules and replace with application rules	3, see FI80
SE3 1		General		te/ed	The design (service) life of the structure should be determined separately for each project and given in the execution specification and not in National Annexes due to the following reasons: a) the owner of the structure should have the right to determine the design life of his property (structure) b) therefore this issue does not belong to National Annex and not to the authority - of course authorities could have a right to give some minimum values	Change all rules for the design life on such a way that the determination of the design life time belong preferably to the owner of the structures, not to National Annex and the authority	3, see FI81
NO1				ge		The concept of Execution Class used in EN 1993-1-1/A1 should be coordinated with other Eurocodes, especially to be clarified as concept in EN 1990.	4, Make a suggestion. To change other ECs is not responsibility of EC3
NO2				ge	A main idea behind the development of the Eurocodes has been to harmonize the design requirements of products – in order to facilitate	The relation between Eurocodes as design standards and harmonized construction product standards should be clarified, primarily in EN	3, This is not within our influence sphere.

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					trade, i.e. to develop design requirements necessary for the harmonization of products. It is still not required by the European Commission (EC) that harmonised construction products shall be designed according the Eurocodes. This is in our opinion in conflict with the idea of harmonization.	1990. SC3 is recommended to advocate this view on behalf of steel products.	
Where should the scope of the EN be extended?							
FR3 0		5.5.2	Table 5.2		Sheet 3/3: the limits given for a circular hollow section are too severe for a member in bending.	Give appropriate limits for a circular hollow section under bending, and bending and axial force.	6
FR3 1		5.5.2	Table 5.2		For circular hollow sections in class 4, a design method should be given to calculate an effective area and an effective elastic modulus, in order to allow a designer to apply the buckling criteria under axial force and bending moment. EN 1993-1-6 does not provide any method.	No proposition for the time being.	4
FR3 2		6.3			It would be useful to give a method for the resistance to lateral torsional buckling of members, under bending moment and tension axial force.	1) Method to be developed; 2) Or apply the general method of 6.3.4 with some additional statements (in case of mono-axial bending about the strong axis).	4
DE3 3		5.3		te, ed	The given values are only allowed in combination with a linear interaction, which unfortunately is not mentioned. Information	Detailed information will be supplied until the middle of December 2014.	3, Statements are unclear, detailed information is awaited

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					of the approach by using a precise interaction (case 6.2) is not included. Here is an urgent need of supplements to obtain economic results.		
DE3 4		6.2			It lacks an interaction relationship for all possible forces.	Detailed information will be supplied until the middle of December 2014.	3, see previous comment
GR2 7				ge	Angle sections are not covered, except for elastic design of cross sections.	Provide rules for member design with angle sections.	3, Angles are treated e.g. in Table 6.2. Also 5 applies.
GR2 8		6.2.6 (3)		te	Rolled H sections with load parallel to flanges are missing.	Provide new formula or unify with case (e).	5, see SC3 doc N1895
GR2 9		6.2.7 (1)		te	Provisions for interaction of torsion with other action effects are not included.	Elastoplastic interaction formulae of all action effects including torsion should be developed and incorporated.	6
GR3 0		6.2.9.1		te	In all cases the provided formulae are restricted to gross section calculations.	Propose procedures to be followed for net section calculations.	4
GR3 1		6.2.9.1(4)		te	Criteria are only provided for doubly symmetrical I- and H-sections or other flanges sections (with the latter being vague).	Provide criteria for all types of cross sections which may be used as bending members. Clarify the term “other flanges sections”.	2
GR3 2		6.2.9.1(5)		te	Formulae are only provided for standard rolled I or H sections and for welded I or H sections with equal flanges.	Provide formulae for all types of cross sections which may be used as bending members.	3, Hollow sections are also covered.
GR3 3		6.3.1.3(1)		te	The evaluation of buckling length of the compression members, especially the ones whose end support conditions are not defined with clarity such as members of multi-story, multi-bay frames, is preferable to be expressed in an informative annex.	Include provisions for buckling length evaluation in an informative annex.	3, No text book material allowed in the code. An ECCS document could be made.
GR3 4		6.4		te	This clause covers only simple supported built-up compression members. However, the most	The clause should be extended to built-up systems with other types of boundary conditions	3. The intention is not to extend this chapter. The basic case is there.

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					common situation refers to cantilevers subjected to compression at the top. Built-up members are also commonly used in frames, sometimes having elastic rotational boundary conditions and developing also bending in addition to compression.	subjected to combined compression and bending.	
GR3 5		6.4.2.2		te	Diagonal lacing bars' effectiveness depends on the angle between them and the chords. The optimal values of the angle depend on the type of lacing arrangement and may lead to higher shear rigidity with smaller sections.	Provide instructions for optimal values of the angle between the diagonal lacing bars and the chords.	3, S_v in Figure 6.9 depends on the angle between lace and chord. The optimum angle can be derived from that.
GR3 6		6.4.3.1		te	In battened built-up members the chords are usually at a close distance between each other. This means that the length of the battens is in many cases relatively small and shear deformations of the battens may play an important role in the evaluation of the shear rigidity in Eq. (6.73)	Modify Eq. (6.73) to take into account shear deformations of the battens in addition to bending deformations of the chords and battens.	4
GR3 7		7		te	No specific limits are provided for the Serviceability Limit State.	Specific limits should be proposed for the Serviceability Limit State for common types of use.	3, see FI60
GR3 8		Annex AB		Te / Ge	Material Non-linearities	Alternative method that takes into account the material non-linearities in overall strength design is possible.	3, but the intention is to transfer or delete Annex AB.
PL3					The change is to be applied in relevant clauses/subclauses and paragraphs of EN 1993-1-1 (and other relevant parts of EN 1993) .		No comment
FI84				General	In these Finnish comments line number has not been given mainly due to the following reasons: -CEN has not defined how the line number should be calculated		No comment

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					***from the beginning or from the end of the standard ***form the top or the bottom of the page ***from the beginning of section, clause or subclause -We assume that people giving answers to these comments are clever enough to understand if the reference is made for example to clause 1.2.3.4(5)		
FI85				General	General Finnish comments to **all Parts** of EN 1993.		No comment
FI86				General	Rules for the design of web opening would be very welcomed, see ENV 1993.		5
SE3 2		General		te/ed	Design based on FE-methods: a) Annex C of EN 1993-1-5 contains some detailed rules, which is a good start for steel structures b) Also some other parts of EN 1993 contains some rules for FE-methods c) EN 1990 should contain basic principles and basic rules for the FE-based design d) All detailed rules for FE-based design of steel structures should be collected into one place, preferable as annex into EN 1993-1-1	All detailed rules for FE-based design of steel structures should be collected into one place, preferable as annex into EN 1993-1-1.	3, To be included in an ECCS document; not in code text. See also FI28.

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Template for comments and secretariat observations

Date: 2014-10-17	Document:	Project: EN 1993-1-1

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NO3				ge	CENELEC has developed standards which covers design of masts for overhead electrical lines (power line), EN 50341. We see no reason why design of such structures should not be covered only by the Eurocodes. TC250/SC3 should take the necessary steps to include such masts within Eurocode 3.	Ensure that Eurocode 3 is the only design standard (the only EN) for masts for electric power lines, i.e. ensure that EN 1993 replaces EN 50341 with respect to design of masts for electric power lines.	3. Not within the power of SC3.
NO4				ge	To the degree that EN 1993 does not fully cover all necessary provisions for design of towers for Wind turbines, necessary additional requirements should be included – to avoid the use of e.g. IEC 61400 for this purpose.	Ensure that EN 1993 covers necessary provisions for design of towers for Wind turbines.	3, This comment does not aim at part 1-1 but at part 3 and should be treated there.
CZ2		6.3.2.2		ge	Unequivocal method for very commonly used channel profiles UPN, UAP, UPE...is not set.	Add clear method for channel profiles.	4

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Where could the EN by shortened?							
FR3 3		5.3.2	(11)	te	This method is rarely used in practice. In addition, it is very complex and no software commonly used by design offices in steel construction is available to apply it.	Remove this clause.	3, It is worthwhile to keep this clause but it needs clarification and improvement: 6 also applies.
FR3 4		5.3.4	(3)	te	This method is rarely used in practice. In addition, it is very complex and no software commonly used by design offices in steel construction is available to apply it.	Remove this clause.	3, Imperfections for GMNIA are necessary also for LTB. However, this clause needs improvement: 6 also applies.
FR3 5		6.2.7	(9)	te	The formulae given in this clause do not fully cover the verification of a cross-section in this situation. They are never used in practice. This is an interaction between shear force and torsion (in the paragraph « Torsion »!) without providing information on the interaction with bending or axial force. Moreover, these expressions are not consistent with clause (7) that allows the designer to neglect the effects of internal Saint-Venant torsion for open cross-sections.	Remove 6.2.7(9). Perform an elastic verification by calculating the equivalent Von Mises stress.	3, Improvements are under way in WG1: 6 also applies.
FR3 6		Annexe BB	BB.3	te	Section never applied in practice.	Remove section BB.3.	2, To be moved to Technical Specification
GB1 0		Annex A and B		te	Only one Annex is required.	Delete either Annex A or B	2
DE3 5				general	First chapters in the beginning which are repeated in every Eurocode part should be presented only once in EN 1990.	Consider to 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	3, Not within the power of SC3. Strongly recommended to have this enforced by TC250.

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						products", which should be presented only in EN 1990.	
DE36		1 to 4		ge,ed	The clauses 1 to 4 can be significantly reduced The readability can be improved by condensing the subdivision.	See the previous comments.	3, These chapters are according to the model chapters only to be changed if agreed upon in TC250.
GR39		2.1.3		ge	Should be shortened	Shorten and make only reference to other parts of EN 1993 or EN 1990	4, also see FI81
GR40		2.2, 2.4, 2.5		ge	These clauses make only reference to EN 1990. They should be shortened	Shorten and make reference to EN 1990	4
GR41		6.3.2		ge	Clause 6.3.2 Rules for lateral torsional buckling should be simplified.	Unify lateral torsional buckling curves.	5
GR42		6.3.2.3		ge	An alternative formula is given for the lateral torsional buckling curves, only for I -cross sections.	No alternative formulae should be provided for the calculation of the same quantity, unless criteria are also provided for selecting one method over the other.	5
GR43		6.3.2.4		ge	Simplified lateral torsional buckling procedures for buildings and bridges could be harmonized	Harmonize simplified methods between EN 1993-1-1 and EN 1993-2	2
FI87				General	In these Finnish comments line number has not been given mainly due to the following reasons: -CEN has not defined how the line number should be calculated ***from the beginning or from the end of the standard ***form the top or the bottom of the page ***from the beginning of section, clause or subclause -We assume that people giving answers to these comments are clever enough to understand if the reference is made for example to clause 1.2.3.4(5)		No comment

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FI88				General	General Finnish comments to **all Parts** of EN 1993.		No comment
FI89		Foreword and first general pages		ed	a) Background to the Eurocode programme b) Status and field of application of Eurocodes c) National Standards implementing Eurocodes d) Links between Eurocodes and harmonized technical specifications (ENs and ETAs) for products	a) Delete. It is enough that this kind of information is given only ones in EN 1990. b) Delete. It is enough that this kind of information is given only ones in EN 1990. c) Delete. It is enough that this kind of information is given only ones in EN 1990. d) Delete. It is enough that this kind of information is given only ones in EN 1990.	3, To be harmonised within TC250.
FI90		General		te/ed	Design based on FE-methods: a) Annex C of EN 1993-1-5 contains some detailed rules, which is a good start for steel structures b) Also some other parts of EN 1993 contains some rules for FE-methods c) EN 1990 should contain basic principles and basic rules for the FE-based design d) All detailed rules for FE-based design of steel structures should be collected into one place, preferable as annex into EN 1993-1-1	All detailed rules for FE-based design of steel structures should be collected into one place, preferable as annex into EN 1993-1-1.	3, See SE32 To be included in an ECCS document; not in code text.
FI91		General		te/ed	Design based on testing: a) At present various rules for the design based on testing are given in various places at least as follows:	a) Annex A of EN 1993-1-3 and Annex D of EN 1990 should be checked so that they are not in contradiction b) All details for design based on testing should	ad a) 3, Comment not relevant for part 1-1

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					* Annex D of EN 1990 ***Specific comments to Annex D of EN 1990 1) Rules and process given in Annex D of EN 1990 do not take into account different safety levels between brittle and tough failure modes. Compare this differentiation in some parts of EN 1993, where γ_{M0} =1,0 and γ_{M2} = 1,25 are given. 2) Basic principles or rules should be given in Annex D of EN 1990 for brittle/tough failure modes. * EN 1993-1-3, EN 1993-3-2, EN 1993-5 *** Some basic rules in Annex D of EN 1990 and in Annex A of EN 1993-1-3 are in contradiction: the basic question is: which document should be followed in practice. ***If there are in additions some rules in ETAG guidelines, which are different, then the question is: Which rules should be followed? *** Annex A of EN 1993-1-3 and Annex A of EN 1993-5 contain much repetition , which should not be allowed in the revised Eurocode-system	be collected only into one document to be included into EN 1990 c) If proposal b) above is not acceptable then at least all rules concerning the design based on testing of steel structures should be collected into one document – preferable as annex into EN 1993-1-1. d) Basic rules for FE-based design should be given in EN 1990 e) Detailed rules for FE-based design of steel structures should be given in one place as annex to EN 1993-1-1.	ad b) 3, This affects clause 2.5. To be dealt with within TC250. ad c) 3, That is what is currently present, see clause 2.5. It is not the intention to enhance this clause. ad d) 3, This does not affect part 1-1. ad e) 3, These rules should go into an ECCS document. See also SE32
SE33		Foreword and first general pages		ed	a) Background to the Eurocode programme b) Status and field of application of Eurocodes	a) Delete. It is enough that this kind of information is given only in EN 1990. b) Delete. It is enough that this kind of information is given only in EN 1990.	3, See FI89 for motivation.

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					c) National Standards implementing Eurocodes d) Links between Eurocodes and harmonized technical specifications (ENs and ETAs) for products	c) Delete. It is enough that this kind of information is given only in EN 1990. d) Delete. It is enough that this kind of information is given only in EN 1990.	
CZ3				ge	Whole standard is extremely voluminous and complicated, without respect to the accuracy of the loading determination. Division into several particular books makes standard sometimes confusing with greater probability of making mistakes.		No comment
Are there any clauses whose application leads to uneconomic construction?							
FR37		6.4.4	Table 6.9	te	The minimum spacing of 15 i_{min} between interconnections is excessively uneconomic with regard to the practice in many countries.	Replace 15 i_{min} by 50 i_{min}.	4
FI92				General	In these Finnish comments line number has not been given mainly due to the following reasons: -CEN has not defined how the line number should be calculated ***from the beginning or from the end of the standard		No comment

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					***form the top or the bottom of the page ***from the beginning of section, clause or subclause -We assume that people giving answers to these comments are clever enough to understand if the reference is made for example to clause 1.2.3.4(5)		
FI93				General	General Finnish comments to **all Parts** of EN 1993.		No comment
FI94				General	See Finnish technical/editorial comments to each part of EN 1993 The question of economy/un-economy is not correct or is misleading. The real question is: Are the rules correct or not independent if they lead to economic or un-economic structures.		No comment
CZ4		6.4.4	Table 6.9	te	15 i_{min} and 70 i_{min} are very strict as well as necessity of using of two transversally orientated connecting plates.	Reassess set demands.	4 See also FR37
Are there any clauses whose application necessitates excessive design effort?							
FR38		Annex A	Table A.1	te	The condition on the reduced slenderness for LTB under uniform moment diagram could be simplified.	Replace this condition by: $\bar{\lambda}_{LT} \leq 0,2\sqrt[4]{\left(1-\frac{N_{Ed}}{N_{cr,z}}\right)\left(1-\frac{N_{Ed}}{N_{cr,T}}\right)}$	4

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GR4 4		5.3.2(6)			The scope of the clause is not clear. Condition (5.8) can be written also as $N_{ed}>0.25N_{cr}$. Which is the reasoning for including bow imperfections in the global analysis for such cases? This fact complicates the analyses to be performed too much.	If needed, an additional member check should be imposed instead for considering bow imperfections in the global analysis.	3, That is exactly the implication of the first sentence of this clause. Concerning rewriting the condition: 2, see FR19 and FR2
GR4 5		Annex A, Annex B		te	The two methods are very complicated. If they are employed via manual calculation, it is difficult to apply them in the design of all members of a structure, for any load combination as they depend not only on the mechanical and geometrical characteristics of the members but also on their internal forces. If on the other hand they are programmed to be incorporated in design software, simplifications for intermediate cases of moment diagrams are necessary, which should not be left upon the programmer, as this may lead either to unsafe or to uneconomical results.	Develop new simpler formulae.	5
FI95				General	In these Finnish comments line number has not been given mainly due to the following reasons: -CEN has not defined how the line number should be calculated ***from the beginning or from the end of the standard ***form the top or the bottom of the page ***from the beginning of section, clause or subclause -We assume that people giving answers to these comments are clever enough to understand if the reference is made for example to clause 1.2.3.4(5)		No comment

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FI96				General	General Finnish comments to **all Parts** of EN 1993.		No comment
FI97				General	See Finnish technical/editorial comments to each part of EN 1993 The question is not correct or is misleading. The real question is: Are the rules correct or not independent if they lead to excessive design effort or not.		No comment

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