EU MS Case study 2: Belgium & Luxembourg

Pierre SPEHL,

SECO, Brussels

Why NATIONAL ANNEXES ?

In a Eurocode Part (= EN standard), there are ***procedures, values, or classes*** *recommendations,* ***for which an agreement could not be reached*** *within CEN TC250 sud-committees.*

These are Nationally Determined Parameters (NDP)

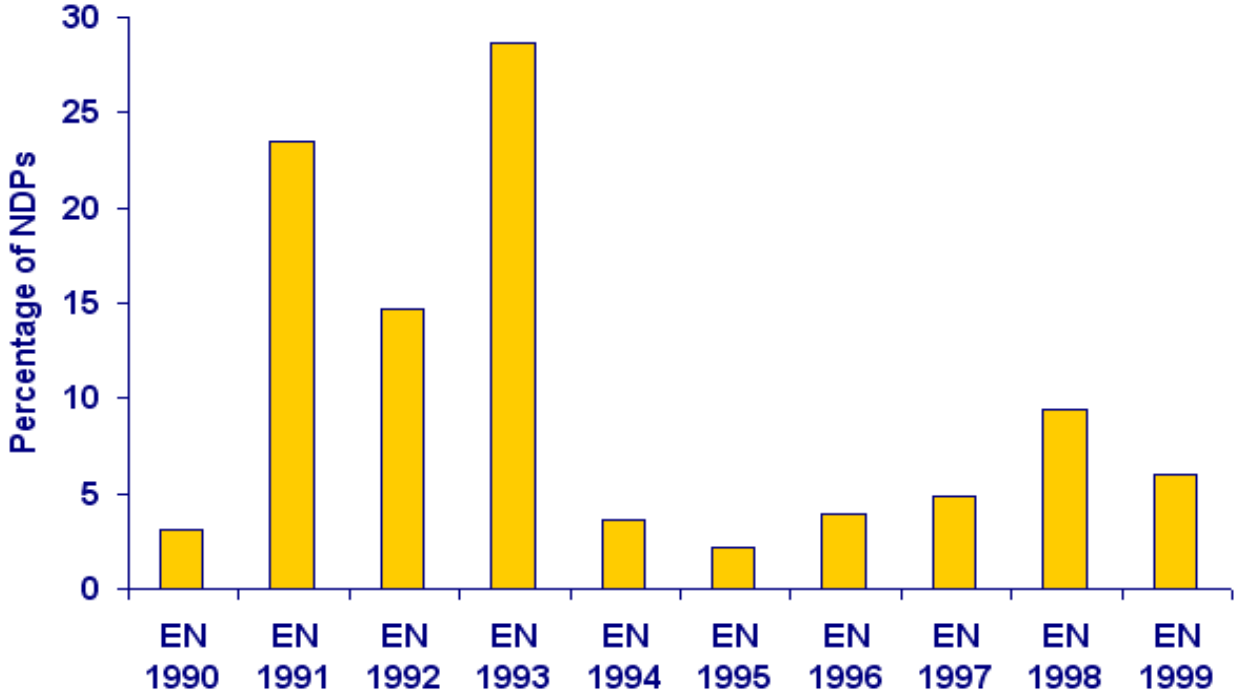
For each of them, ***a NOTE in the EN standard :***

- indicates that a National choice should be given in a NATIONAL ANNEX *to this Eurocode Part and*

- gives a recommendation for a National choice *that provides an acceptable level of reliability.*

Nationally Determined Parameters

Number : 1504 (all EUROCODES Parts)



National Annexes to EUROCODE Parts

National Annexes may only contain information on those NDPs which are left open for national choice:

- ***Values and/or classes where alternatives are given***
- ***Values to be used where a symbol only is given***
- ***Country specific data (geographical, climatic, etc.)***
- ***Procedures to be used where alternatives are given***

Values and/or classes where alternatives are given

Example from EN 1991-1-1 "Imposed loads":

Table 6.2 – Imposed loads on floors, balconies and stairs in buildings		
Categories of loaded areas	q_k [kN/m²]	Q_k [kN]
Category A		
- Floors	1,5 to 2,0	2,0 to 3,0
- Stairs	2,0 to 4,0	2,0 to 4,0
- Balconies	2,5 to 4,0	2,0 to 3,0
Category B	2,0 to 3,0	1, 5 to 4,5
Category C		
- C1	2,0 to 3,0	3,0 to 4,0
- C2	3,0 to 4,0	2,5 to 7,0 (4,0)
- C3	3,0 to 5,0	4,0 to 7,0
- C4	4,5 to 5,0	3,5 to 7,0
- C5	5,0 to 7,5	3,5 to 4,5
Category D		
-D1	4,0 to 5,0	3,5 to 7,0 (4,0)
-D2	4,0 to 5,0	3,5 to 7,0

Values to be used where a symbol only is given

Example from EN 1991-1-5 "Thermal actions":

6.1.5 Simultaneity of uniform and temperature difference components

(1) If it is necessary to take into account both the temperature difference $\Delta T_{M,heat}$ (or $\Delta T_{M,cool}$) and the maximum range of uniform bridge temperature component $\Delta T_{N,exp}$ (or $\Delta T_{N,con}$) assuming simultaneity (e.g. in case of frame structures) the following expression may be used (which should be interpreted as load combinations):

$$\Delta T_{M,heat} \text{ (or } \Delta T_{M,cool}) + \omega_N \ \Delta T_{N,exp} \text{ (or } \Delta T_{N,con}) \qquad (6.3)$$

or

$$\omega_M \ \Delta T_{M,heat} \text{ (or } \Delta T_{M,cool}) + \Delta T_{N,exp} \text{ (or } \Delta T_{N,con}) \qquad (6.4)$$

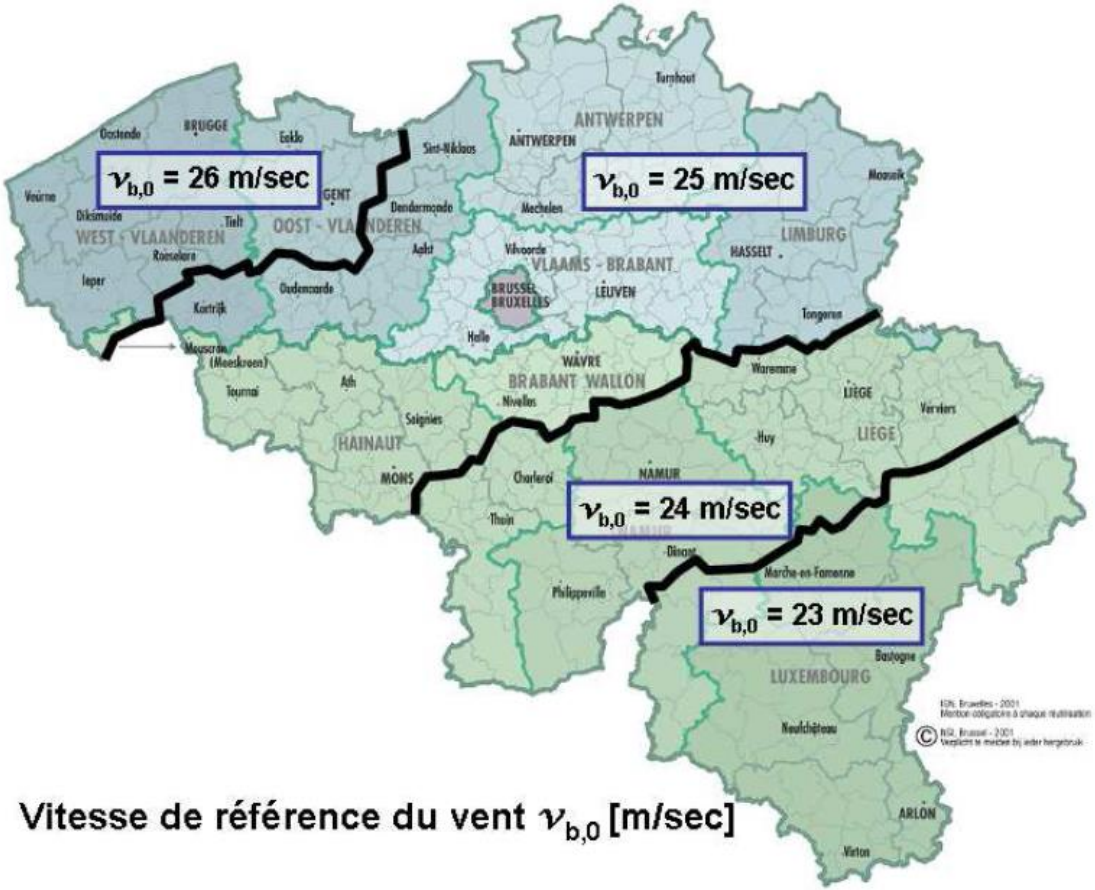
where the most adverse effect should be chosen.

NOTE 1: The National annex may specify numerical values of ω_N and ω_M. If no other information is available, the recommended values for ω_N and ω_M are:

ω_N = 0,35

ω_M = 0,75.

Country specific data : Belgian National Annex to EN 1991-1-4 (wind)



Procedures to be used where alternatives are given

Example from EN 1991-1-2 "Actions on structures exposed to fire" :

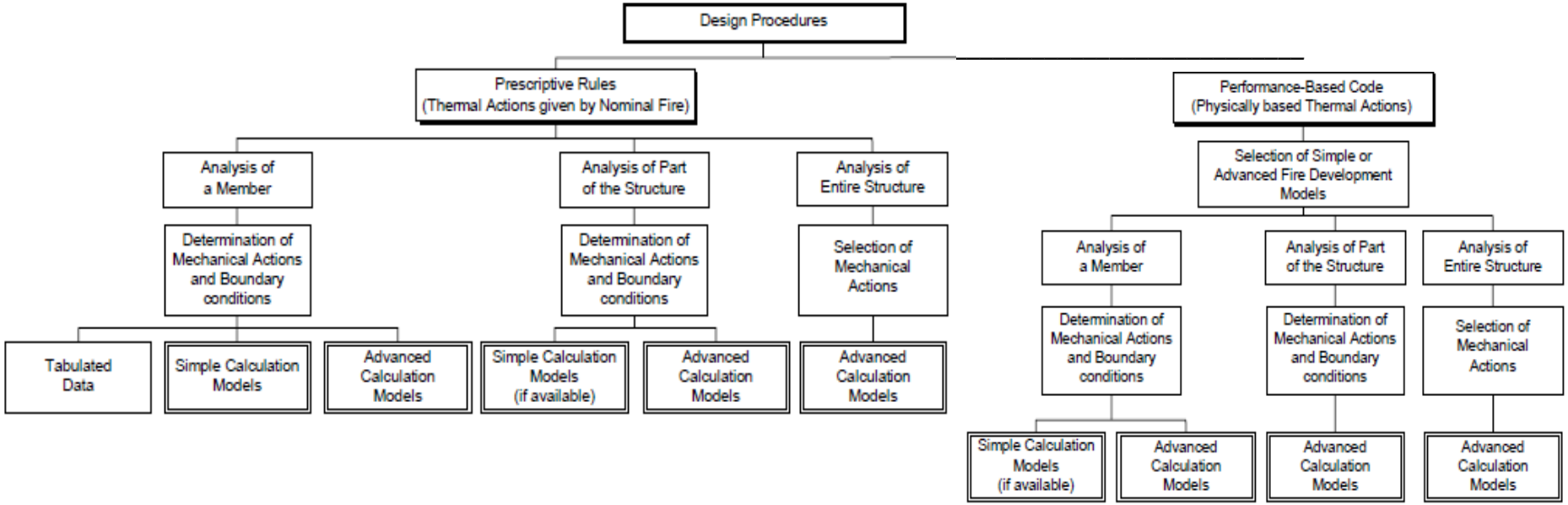


Figure 1 — Alternative design procedures

Belgian National Annexes (NBN)

NBN (Belgian Bureau of Standards) :

- 58 Working Groups to draft the Belgian National Annexes (ANB)

- Projects in Flemish and French submitted to public enquiry (6 month)

- National Annexes published as NBN standards (December 2011)

Belgian National Annexes : dash-board

ANB EUROCODES										ANB EUROCODES								ANB EUROCODES		
N°	Eurocode Part	Short EN title	Last send, FR version of ANB	Last send, NL version of ANB	AC taken in account	A1 taken in account	Vote DD in Final Draft ANB	Sent to NBN for public enquiry	Vote Launch (delivery)	End Belgian Public Enquiry	Comments public enquiry	Final approval	Sent to NBN for Publication	Date NBN Publication	NB Annexes	TO DO resp.	Belgian convenor ANB	Status	Resp. ANC	Upl. on ANC
1	1990	Basis of design	08/09/2005	08/09/2005			(22/06/05)		28/07/04	15/10/04	no	30/08/05		oct-05	19/05/08	-	P. Spehl	available at NBN (Moniteur)	G. Labeeuw	yes
2	1990 Ed2 + A2	Basis of design	14/04/2011	10/05/2011	2010		15/06/2011	23/06/11	16/06/11	16/01/12	yes			déc-11		NBN	P. Spehl	public inquiry (Moniteur)	P. Spehl	
		LOADS																		
3	1991-1-1	Buildings - General	7/09/2005			2009	(22/06/05)		28/07/04	15/10/04	no	11/05/05		oct-05	19/05/08	-	P. Spehl	available at NBN (Moniteur)	P. Spehl	yes
4	1991-1-2	Fire - Actions	08/01/2008 (FR)	P 28/01/2008 (NL)	2009		29/03/2006		23/05/06	15/09/06	yes	20/06/08		juin-08	4/02/09	-	P. Spehl	available at NBN (Moniteur)	P. Spehl	
5	1991-1-3	Snow loads	28/06/2006		2009		(22/06/05)		15/12/05	1/05/06	yes	28/06/06	14/11/07	nov-07	19/05/08	-	P. Spehl	available at NBN (Moniteur)	P. Spehl	
6	1991-1-4	Wind - Actions	27/01/2010		2010		2/12/2008		1/04/09	27/08/09		21/05/10	18/06/10	déc-10	23/12/10	-	P. Spehl	available at NBN (Moniteur)	P. Spehl	
7	1991-1-5	Thermal actions	P 15/01/2008 (FR)		2009		14/05/08		19/06/08	20/11/08		2/12/08		janv-09	14/05/09	-	G. Labeeuw	available at NBN (Moniteur)	G. Labeeuw	
8	1991-1-6	Actions- execution	P 15/01/2008 (FR)		2008		20/10/08		3/02/09	30/06/09	no	7/09/09	18/06/10	déc-10	23/12/10	-	B. Parmentier	available at NBN (Moniteur)	B. Parmentier	
9	1991-1-7	Accidental	6/04/2011	6/04/2011	2010		12/02/10	8/04/10	17/06/10	16/01/11	no	31/03/11	7/04/11	juin-11		NBN	G. Labeeuw	sent to NBN for publication	G. Labeeuw	
10	1991-2	Traffic Bridges	14/04/2011	14/04/2011	2010		4/05/10		18/10/10	20/03/11	no	15/06/11	23/06/11	déc-11		NBN	G. Labeeuw	sent to NBN for publication	G. Labeeuw	
11	1991-3	Cranes and machinery	1/06/2011	1/06/2011	/	/	27/11/09		17/02/10	30/06/10		15/06/11	23/06/11	sept-11		NBN	R. Debruyckere	sent to NBN for publication	B. Parmentier	
12	1991-4	Silos & Tanks	1/06/2011	1/06/2011	/	/	27/11/09		17/02/10	30/06/10		15/06/11	23/06/11	sept-11		NBN	R. Debruyckere	sent to NBN for publication	B. Parmentier	
		CONCRETE																		
13	1992-1-1	General	P 03/2007		2008	2010			20/09/07	15/12/07	yes	7/09/09	29/04/10	mai-10	10/05/10	-	L. Taerwe	available at NBN (Moniteur)	L. Taerwe	
14	1992-1-2	Fire	17/09/2007 (FR)	13/11/2007 (NL)	2008		3/09/07		14/02/08	15/07/08		7/09/09	29/04/10	mai-10	10/05/10	-	Dotreppe	available at NBN (Moniteur)	L. Taerwe?	
15	1992-2	Bridges	23/07/2010	/	2008									déc-11		BP	P. Van Bogaert	translation/layout in progress	B. Parmentier	
16	1992-3	Liquid retain. & cont struct.	B027 F Rev4	B027 Rev1	/	/	12/02/10	8/03/10	18/05/10	15/10/10	no			déc-11		BP	B. Parmentier	publ. enqu. comments analysis	B. Parmentier	
		STEEL																		
17	1993-1-1	General	12/12/2009	12/12/2009	2009		14/05/08		19/06/08	20/11/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Maquoi	available at NBN (Moniteur)	R. Debruyckere	yes
18	1993-1-2	Fire	12/12/2009	12/12/2009	2009		20/06/08		7/07/08	7/12/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
19	1993-1-3	Cold formed	14/09/2010	14/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
20	1993-1-4	Stainless steels	14/09/2010	14/09/2010	/	/	27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Maquoi	available at NBN (Moniteur)	R. Debruyckere	yes
21	1993-1-5	Plated structural elements	17/09/2010	17/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Maquoi	available at NBN (Moniteur)	R. Debruyckere	yes
22	1993-1-6	Shell structures	22/09/2010	22/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	G. Lagae	available at NBN (Moniteur)	R. Debruyckere	yes
23	1993-1-7	Strength of planar plated struct.	22/09/2010	22/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
24	1993-1-8	Fasteners	21/11/2009	21/11/2009	2009		20/06/08		7/07/08	7/12/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	J.P. Jaspart	available at NBN (Moniteur)	R. Debruyckere	yes
25	1993-1-9	Fatigue	17/09/2010	17/09/2010	2009		20/06/08		7/07/08	7/12/08	no	10/09/10	22/09/10	déc-10	23/12/10	-	E. Pirapez	available at NBN (Moniteur)	R. Debruyckere	yes
26	1993-1-10	Grades	21/11/2009	21/11/2009	2009		20/06/08		7/07/08	7/12/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
27	1993-1-11	High strength tension comp.	19/12/2009	19/12/2009	2009		20/06/08		7/07/08	7/12/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
28	1993-1-12	High steel grades	22/11/2009	22/11/2009	2009		20/06/08		7/07/08	7/12/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
29	1993-2	Bridges	22/09/2010	22/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
30	1993-3-1	Towers and masts	28/09/2010	28/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
31	1993-3-2	Chimneys	28/09/2010	28/09/2010	/	/	27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
32	1993-4-1	Silos	28/09/2010	28/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
33	1993-4-2	Tanks	28/09/2010	28/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
34	1993-4-3	Pipelines	28/09/2010	28/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	RDB + U Gent	available at NBN (Moniteur)	R. Debruyckere	yes
35	1993-5	Piling	28/09/2010	28/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
36	1993-6	Crane supporting structures	28/09/2010	28/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
		COMPOSITE																		
37	1994-1-1	General	12/12/2009	12/12/2009	2009		14/05/08		19/06/08	20/11/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Maquoi	available at NBN (Moniteur)	R. Debruyckere	yes
38	1994-1-2	Fire	21/12/2009	21/12/2009	2008		20/06/08		7/07/08	7/12/08	no	12/02/10	30/03/10	déc-10	1/12/10	-	R. Debruyckere	available at NBN (Moniteur)	R. Debruyckere	yes
39	1994-2	Bridges	29/09/2010	29/09/2010	2009		27/11/09		17/02/10	30/06/10	no	29/10/10	15/11/10	mars-11	2/03/11	-	P. Van Bogaert	available at NBN (Moniteur)	R. Debruyckere	yes
		TIMBER																		
40	1995-1-1	General	3/09/2009	3/09/2009	2009	A1	20/06/08		7/07/08	7/12/08	no	4/06/10		déc-11		I. Kinne	I. Kinne	publ. enqu. comments analysis	B. Parmentier	
41	1995-1-2	Fire	3/09/2009	3/09/2009	2009		20/06/08		7/07/08	7/12/08	no	27/11/09		déc-11		I. Kinne	J.-M. Franssen	document should be sent to NBN	B. Parmentier	
42	1995-2	Bridges	3/09/2009	3/09/2009	/	/	20/06/08		7/07/08	7/12/08	no	27/11/09		déc-11		I. Kinne	I. Kinne	document should be sent to NBN	B. Parmentier	
		MASONRY																		
43	1996-1-1	General	D020 Rev 7 F	D020 Rev 7 N	2009		20/10/08		3/02/09	30/06/09	yes	27/11/09	18/06/10	nov-10	24/11/10	-	O. Pfeffermann	available at NBN (Moniteur)	B. Parmentier	
44	1996-1-2	Fire	V6 24-01-2011	V6 24-01-2011	2010		1/04/09	21/08/09	28/10/09	28/03/10	no	31/03/11	7/04/11	juin-11		NBN	A. Bruls	sent to NBN for publication	B. Parmentier	
45	1996-2	Design considerations,...	D021 Rev7 F	D021 Rev7 N	2009		20/10/08		3/02/09	30/06/09	no	27/11/09	18/06/10	nov-10	24/11/10	-	O. Pfeffermann	available at NBN (Moniteur)	B. Parmentier	
46	1996-3	Simplified calc. Methods			2009		4/06/10	23/11/10	4/01/11	15/06/11				déc-11		YG	O. Pfeffermann	publ. enqu. comments analysis	B. Parmentier	
		GEOTECHNIC																		
47	1997-1	General	P 01/12/2004			2009	10/09/10	3/11/10	4/01/11	15/06/11				déc-11		MDV	M. De Vos	publ. enqu. comments analysis	B. Parmentier	
48	1997-2	Ground investigation & testing			2010		10/09/10	3/11/10	4/01/11	15/06/11				déc-11		MDV	M. De Vos	publ. enqu. comments analysis	B. Parmentier	
		SEISMIC																		
49	1998-1	General	31/05/2011	31/05/2011	2009		3/02/09		23/09/09	20/02/10	no	16/06/11	7/07/11	sept-11		NBN	H. Degée	sent to NBN for publication	A. Plumier	yes
50	1998-2	Bridges	31/05/2011	31/05/2011	2010	A1:2009	3/02/09		23/09/09	20/02/10	no	16/06/11		sept-11		AL	A. Lothaire	final translation in progress	A. Plumier	yes
51	1998-3	Assessment & retrofitting	31/05/2011	31/05/2011	2010		3/02/09		23/09/09	20/02/10	no	16/06/11	7/07/11	sept-11		NBN	W. Vanalboom	sent to NBN for publication	A. Plumier	yes
52	1998-4	Silos, tanks & pipes	31/05/2011	31/05/2011	/	/	3/02/09		23/09/09	20/02/10	no	16/06/11	7/07/11	sept-11		NBN	JD Renard	sent to NBN for publication	A. Plumier	yes
53	1998-5	foundations,geotechnic	31/05/2011	31/05/2011	/	/	3/02/09		23/09/09	20/02/10	no	16/06/11	7/07/11	sept-11		NBN	N. Lambert	sent to NBN for publication	A. Plumier	yes
54	1998-6	Mast, chimneys,...	31/05/2011	31/05/2011	/	/	3/02/09		23/09/09	20/02/10	no	16/06/11	7/07/11	sept-11		NBN	F. Kaiser	sent to NBN for publication	A. Plumier	yes
		ALUMINIUM																		
55	1999-1-1	General rules	10/05/2010	10/05/2010	/	/	23/06/09		30/11/09	30/04/10	no	4/06/10	3/11/10	mars-11	2/03/11	-	J. Dekeyser	available at NBN (Moniteur)	R. Debruyckere	yes
56	1999-1-2	Fire	10/05/2010	10/05/2010	2009		23/06/09		30/11/09	30/04/10	no	4/06/10	3/11/10	mars-11	2/03/11	-	P. van Tendeloo	available at NBN (Moniteur)	R. Debruyckere	yes
57	1999-1-3	Fatigue	12/10/2010	12/10/2010	/	/	7/09/09		30/11/09	30/04/10	no	17/11/10	23/11/10	mars-11	2/03/11	-	K. Vanden Bergh	available at NBN (Moniteur)	R. Debruyckere	yes
58	1999-1-4	Cold formed struct. sheeting	10/05/2010	10/05/2010	2009		23/06/09		30/11/09	30/04/10	no	4/06/10	3/11/10	mars-11	2/03/11	-	G. Zarmati	available at NBN (Moniteur)	R. Debruyckere	yes
59	1999-1-5	Shells	10/05/2010	10/05/2010	2009		23/06/09		30/11/09	30/04/10	no	4/06/10	3/11/10	mars-11	2/03/11	-	G. Zarmati	available at NBN (Moniteur)	R. Debruyckere	yes

Luxembourg National Annexes (ILNAS)

Based on the Belgian National Annexes

- One Working Group of 6 Experts to draft the 58 projects for Luxembourg (Dec. 2009 – March 2010):

2 Belgians (reporters) from NBN/SECO

4 Experts from Luxembourg

- Public enquiry (June 2010-March 2011)

- Projects commented to be revised by working groups including the authors of comments (May-August 2011)

- Publication as ILNAS standards (December 2011)

Luxembourg National Annexes (ILNAS)

The projects of Luxembourg National Annexes have been notified to the European Commission.

The 58 projects may be freely downloaded in the 22 languages of the European Union on :

http://ec.europa.eu/growth/tools-databases/tris/en/search/

Year : ***2010***

Country : ***Luxembourg***

Product type : ***B00 : Construction***

Example of AN-LU : EN 1991-1-3 « Snow loads »

Paragraph	Parameters defined at the national level
1.1(2) NOTE 1	Not applicable: the various altitudes within Luxembourg do not exceed 600 m.
1.1(3) NOTE 2	Case A contained in table A.1 of Annex A shall apply. The loads are not differentiated based on the applicable site conditions.
1.1(4) NOTE 3	Annex B shall not apply.
2(3) NOTE	Exceptional snow loads shall not apply.
2(4) NOTE	Exceptional accumulations of snow shall not apply.
3.3(1) NOTE 2	None of the project locations requires the application of exceptional conditions.
3.3(3) NOTE 2	None of the project locations requires the application of exceptional conditions.
4.1(1) NOTE 1	The characteristic value s_k (in kN/m²) of the ground snow load is defined by the expression (4.2 AN-LU) which is based on altitude A (in m): $s_k = 0.41 + A/966$ [kN/m²] (4.2 AN-LU) ***NON-CONTRADICTORY COMPLEMENTARY INFORMATION:*** ***The characteristic value s_k corresponds to a probability of 0.02, i.e. a return period of 50 years.***

NATIONAL ANNEXES to EUROCODE Parts

National Annexes may also contain :

- ***Decisions on the application of informative annexes of a Eurocode Part***
  - *to be normative,*
  - *to remain informative or*
  - *not to be applied*

- ***References to non-contradictory complementary information to assist the user to apply the Eurocode Part***

Torsional vibrations of TACOMA bridge (1940)

Aeroelastic instabilities – critical velocities

E.2 Galloping

$$v_{CG} = \frac{2 \cdot Sc}{a_G} \cdot n_{1,y} \cdot b \qquad \text{(E.18)}$$

a_G is the factor of galloping instability (Table E.7)

E.4.4.4 AN-LU Instability of bridges under pure torsion

$$v_{CT} = n_{1,t}.d.\tau \qquad \textit{(E.32 AN-LU)}$$

τ *is the instability coefficient under torsion of the bridge*

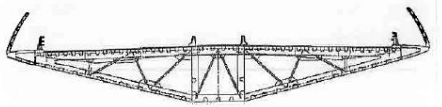
E.4.4.5 AN-LU Instability of bridges under both bending and torsion

$$v_{C\varepsilon} = \pi.n_{r,f}.d.\beta.\eta \qquad \textit{(E.33 AN-LU)}$$

β *is the instability coefficient under both bending and torsion of a flat sheet parallel to the wind direction.*

η *is the ratio between the critical speed of the deck section and the critical speed of a plate which is parallel to the wind direction. It is given in figure E.15 AN-LU based on* $\varepsilon = n_{1,t}/n_{r,f}$ *as well as on the cross-section type of the bridge deck.*

MILLAU bridge



National Calibration Period (summary)

1990-1999 : drafting of pre-standards (ENV)

2002-2007 : publication of the 58 Eurocode Parts (ENs) – first edition

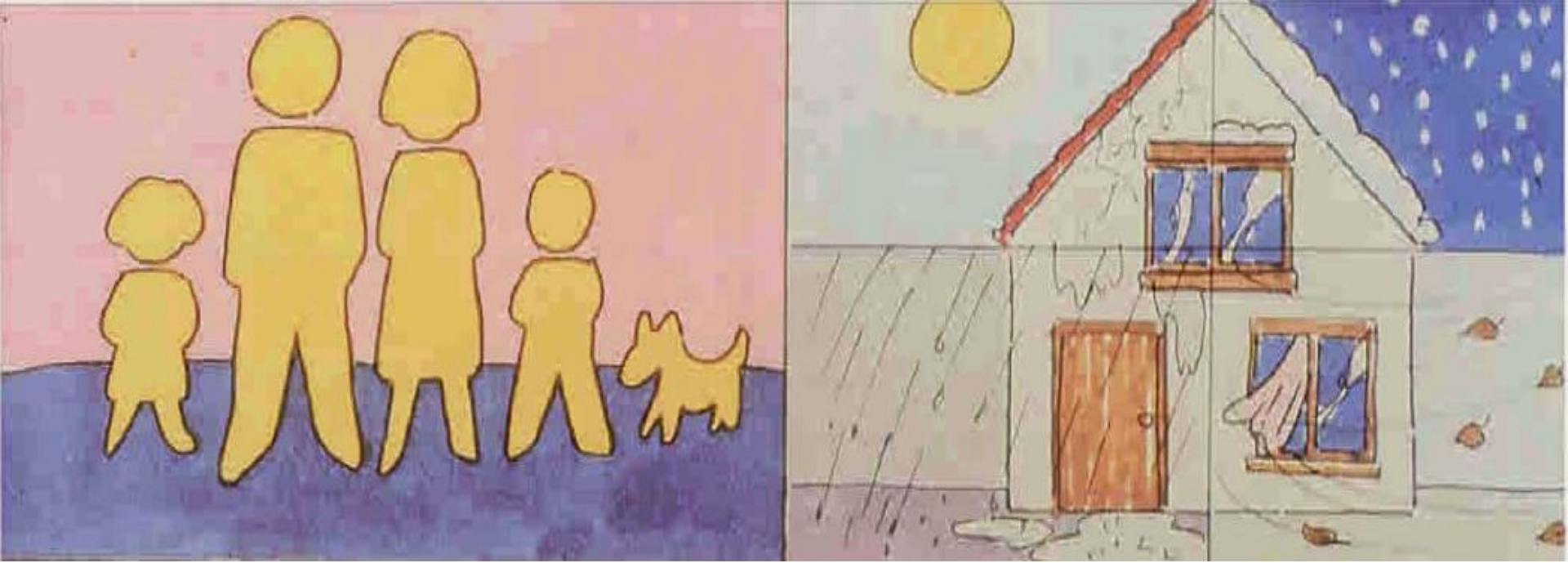
2007-2011 : drafting of the NATIONAL ANNEXES by the National Standardization Bodies

- ***Comparison with National Standards & Regulations***
- ***Examples of applications: buildings, bridges, etc.***
- ***Non-contradictory complementary information for items not covered by the Eurocodes***

2014 : five years review

2016 : starting of ENs revision - second edition

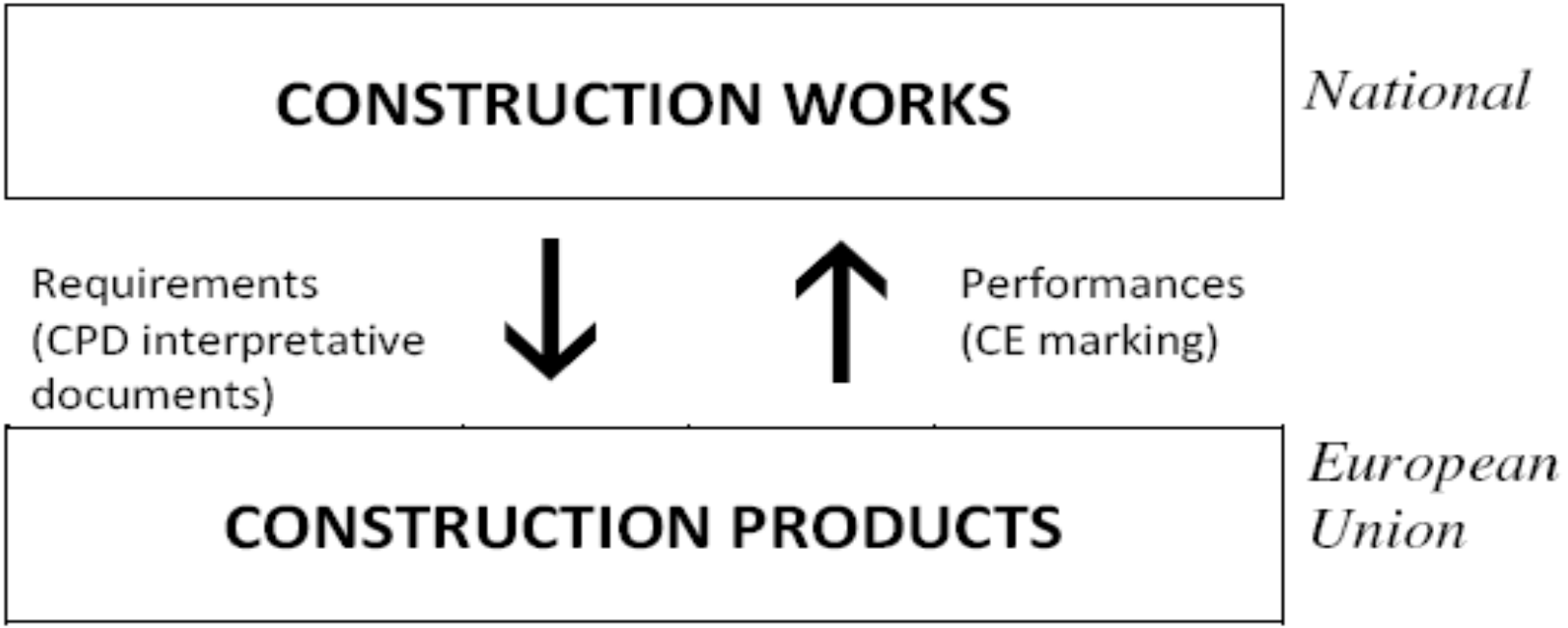
2020 : second generation of Eurocodes available



REQUIREMENTS ⇔ PERFORMANCES

CONSTRUCTION PRODUCTS REGULATION

jurisdiction



Code of Hammurabi (1760 BC)

"If a builder builds a house for someone, and does not construct it properly, and the house which he built collapses and kills its owner, then that builder shall be put to death." *(Art. 229)*

"If it ruins goods, he shall make compensation for all that has been ruined, and in as much as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means." *(Art. 232)*

Civil Code of Napoleon (1804)

"If the edifice, built at a set price,

perish in whole or in part

by defect in its construction,

even by defect in the foundation,

the architect and the contractor

are responsible therefore for ten years."

(Art. 1792)

APPLICABILITY OF STANDARDS

Source	CIVIL CODE	LAW
Technical requirements	JURISPRUDENCE of the COURTS	REGULATIONS
Application	a posteriori	a priori
Standards (e.g. Eurocodes)	Referenced good practice but not compulsory	Compulsory only if imposed by regulation

Thank you for your attention!

Stay in touch

http://eurocodes.jrc.ec.europa.eu/

www.cenorm.be

www.seco.be