European Commission

Experience in preparing the National Annexes in Belgium & Luxembourg

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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.***

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

NOTE: Where a range is given in this table, the value may be set by the National annex. The recommended values, intended for separate application, are underlined. q_k is intended for the determination of general effects and Q_k for local effects. The National annex may define different conditions of use of this Table.

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

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

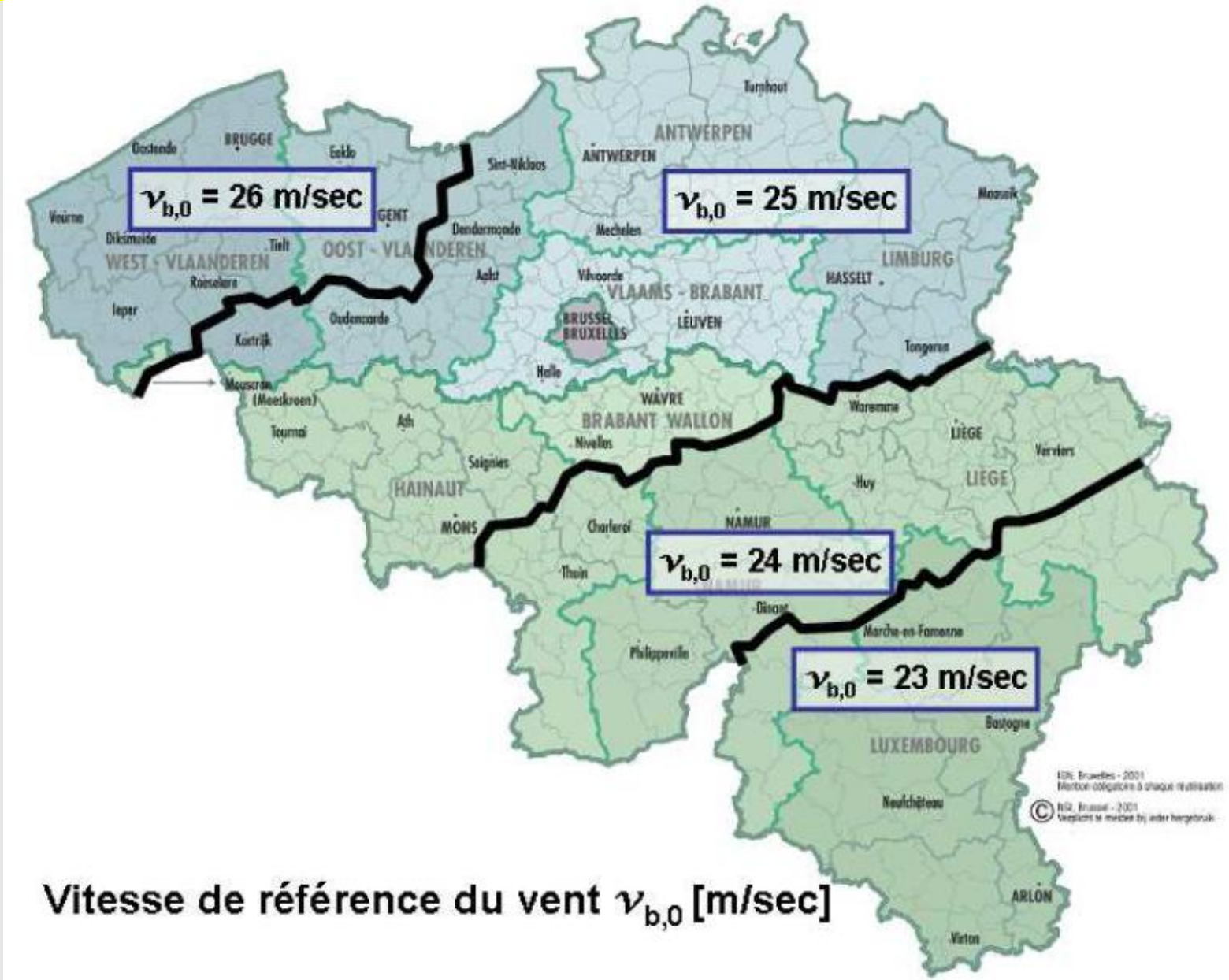
where the most adverse effect should be chosen.

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 (geographical, climatic, etc.): 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":

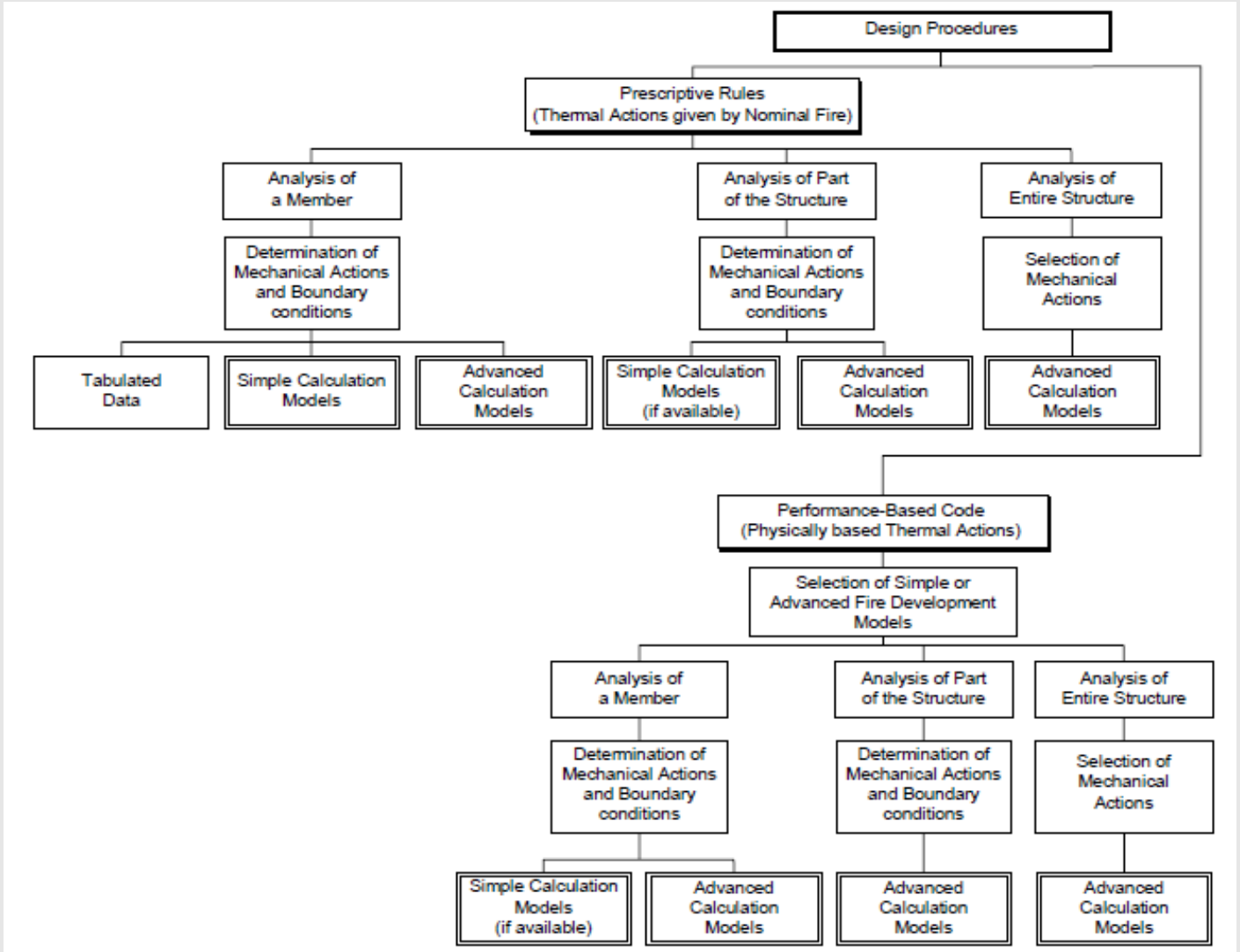


Figure 1 — Alternative design procedures

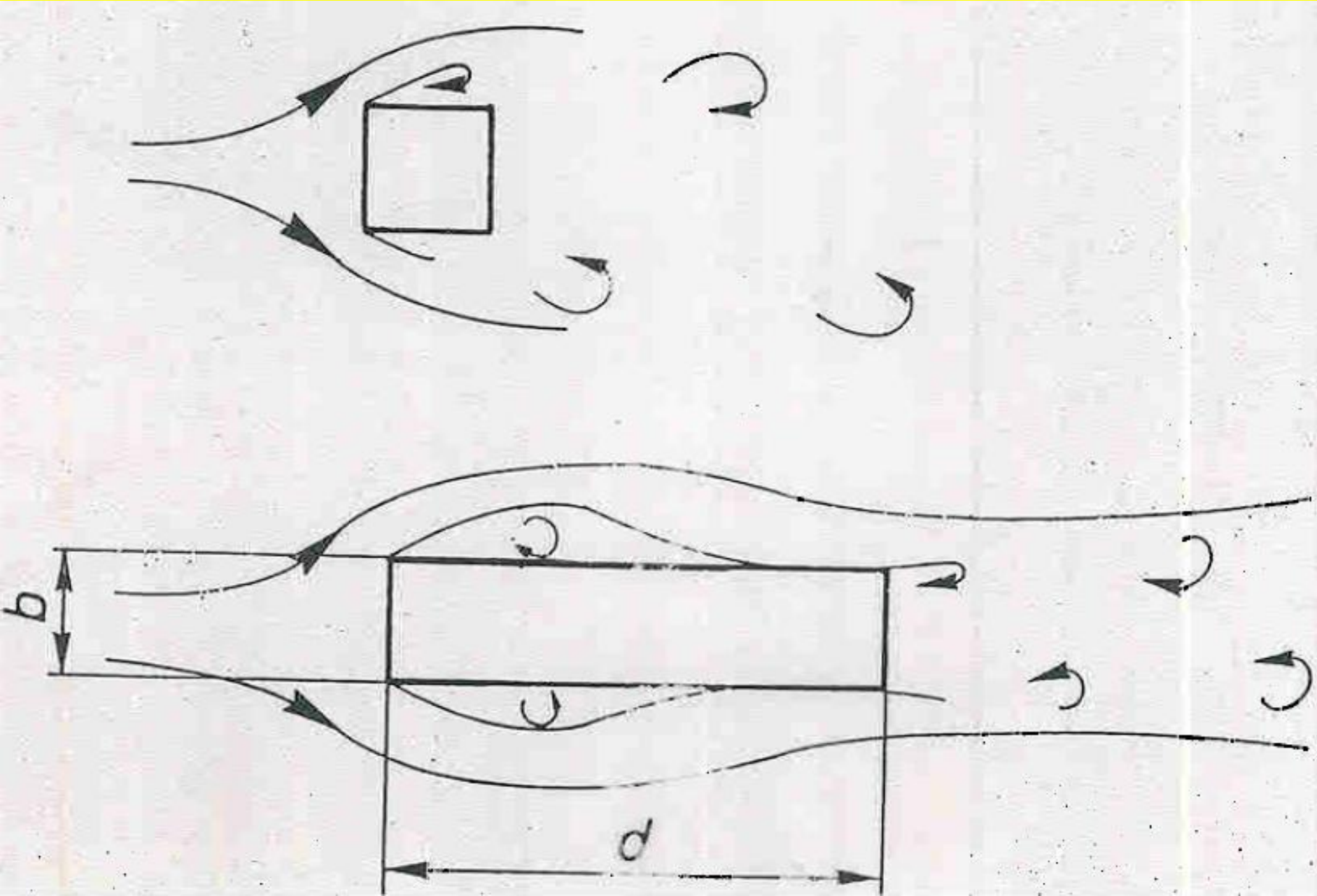
NATIONAL ANNEXES to EUROCODE Parts

National Annexes <u>may also contain</u> :

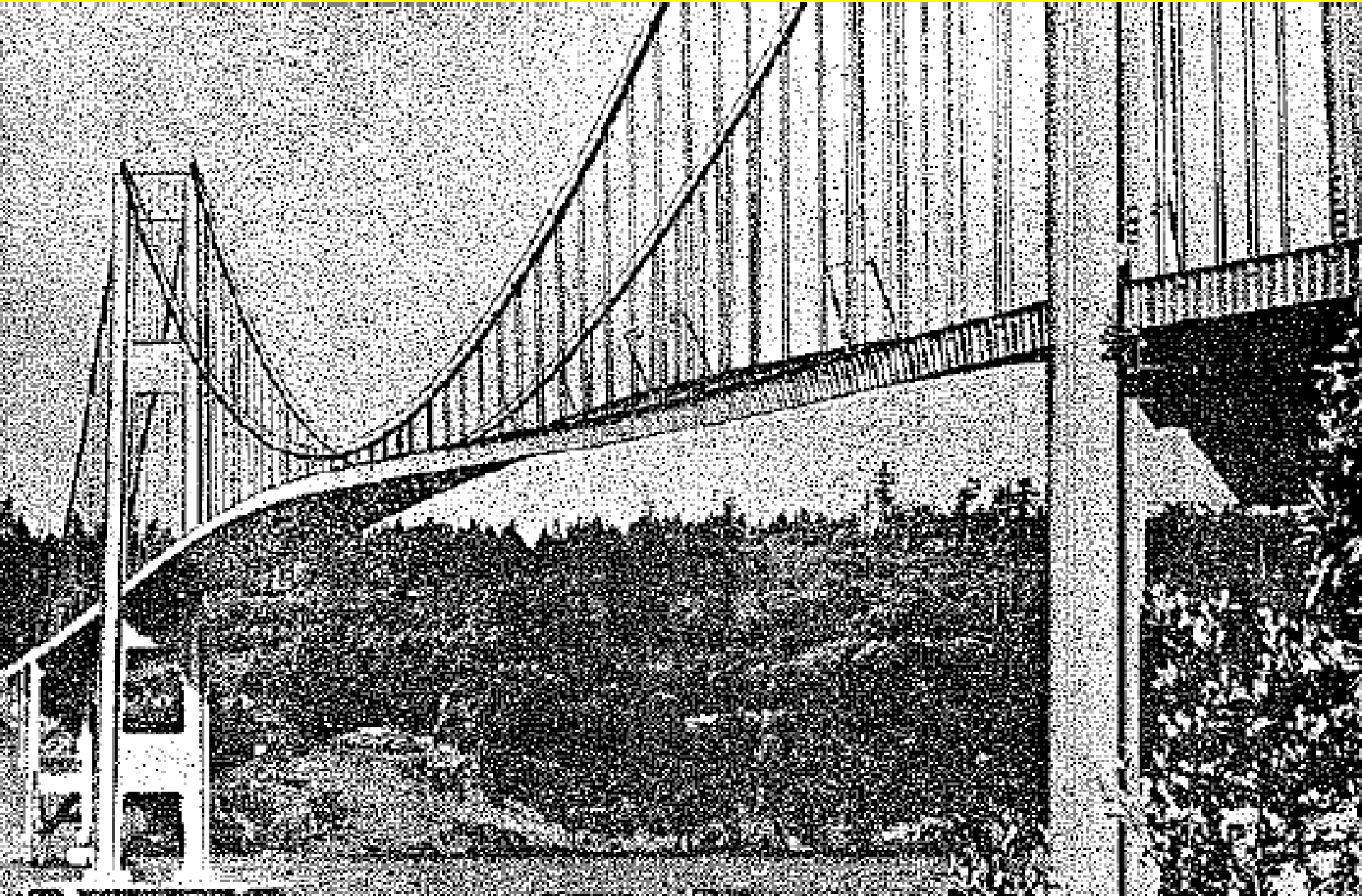
- ***Decisions on the application of <u>informative annexes</u> of a Eurocode Part***
  - *to become normative,*
  - *to remain informative or*
  - *not to be applied*

- ***References to <u>non-contradictory complementary</u> information to assist the user to apply the Eurocode Part***

Annex E: Vortex shedding



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*

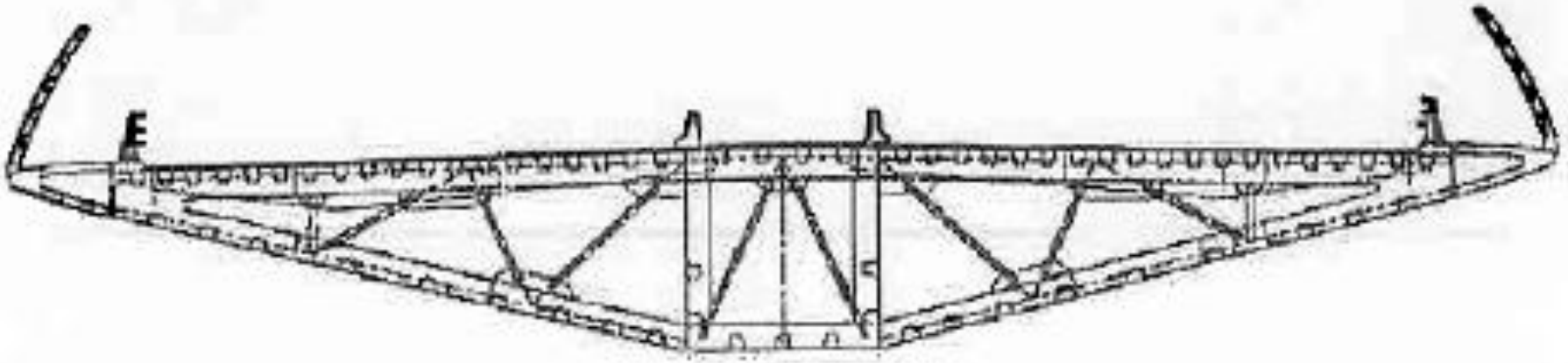
E.4.4.5 AN-LU Instability of bridges under both bending and torsion

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

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 deck – cross section



National Calibration Period (summary)

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

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

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 year review & starting of ENs revision

2020 : second generation of Eurocodes available

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)***

Luxembourg National Annexes (ILNAS)

Based on the Belgian National Annexes

One Working Group of 6 Experts to draft the 58 projects for Luxembourg (12/2009 – 03/2010) :

- ***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/enterprise/tris/pisa/app/search/index.cfm?fuseaction=advanced&lang=en

Year : ***2010***

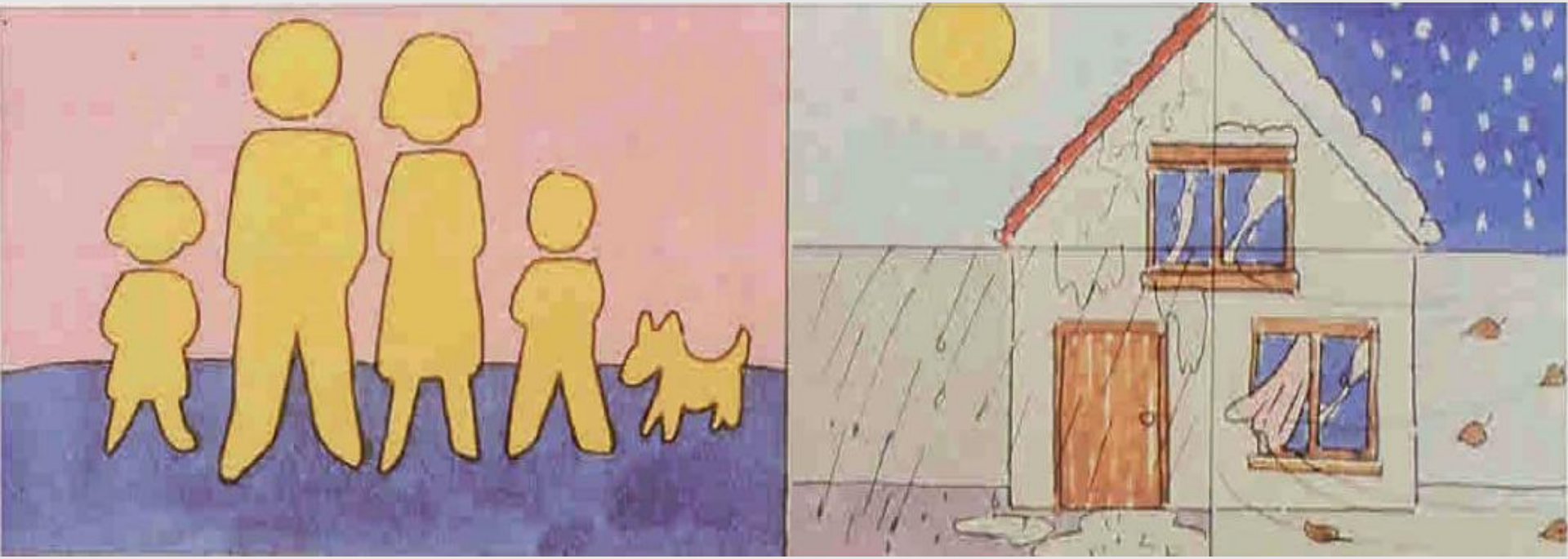
Country : ***Luxembourg***

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.***

users *actions*



REQUIREMENTS ⇔ PERFORMANCES

Code of Hammurabi (1760 BC)

- ***"If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death."***

  (Art. 229)

- ***"If it ruin 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)

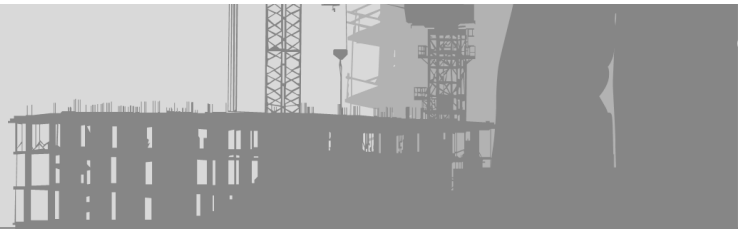
Civil Code of Napoleon (1804)

"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)

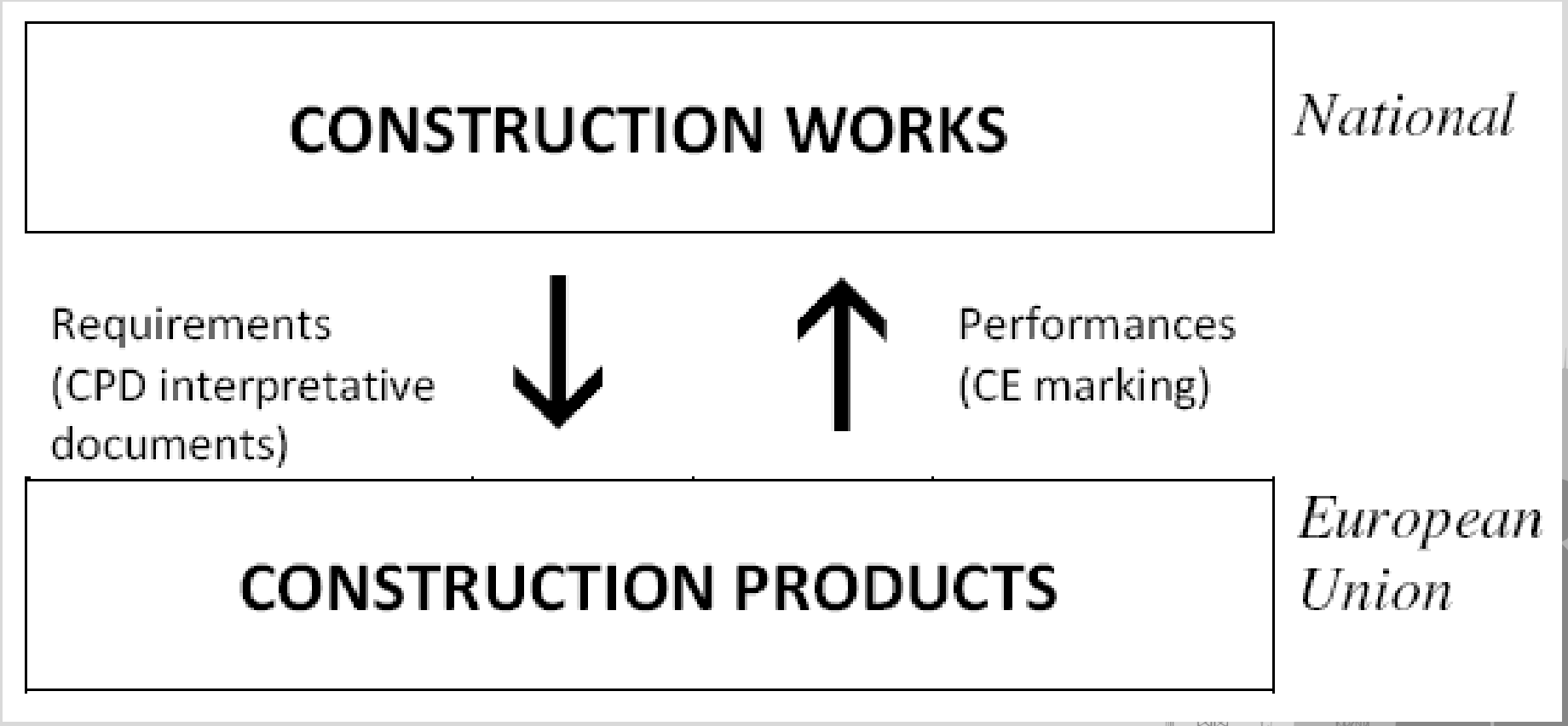
Applicability of standards

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



Construction Products Regulation

jurisdiction



Thank's for your attention

EUROPEAN COMMITTEE FOR STANDARDIZATION

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