Future development of Eurocode 7

Andrew Bond
Chairman TC250/SC7

Each Eurocode costs 1 million euro

'CEN estimates that the development of each standard costs approximately 1 million €, which is mainly covered by industry'

Minutes of CEN TC250 meeting, Ispra, Sept 2009

Outline of the talk

The future of the Eurocodes
Questionnaire on the evolution of Eurocode 7
Response from
- the British geotechnical community
- European National Standards Bodies

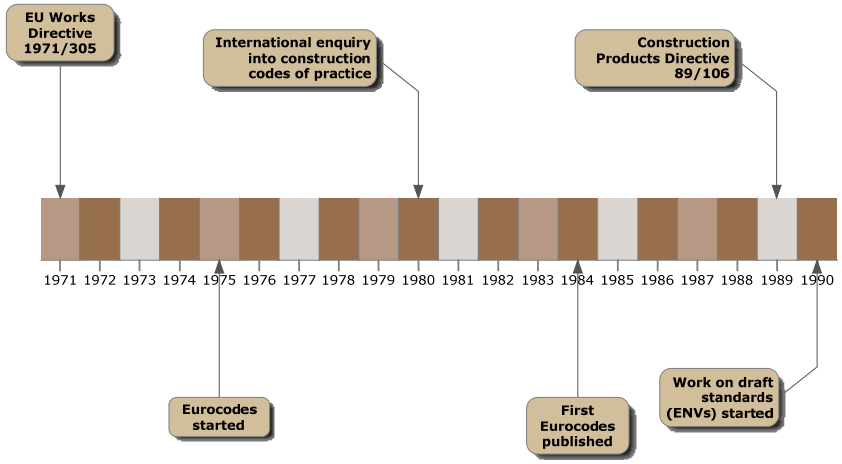
Proposal for evolution of EN 1997
Key findings

The future of the Eurocodes

Future development of Eurocode 7

BGA Symposium – Eurocode 7 Today and Tomorrow, Cambridge, England, March 2011

Eurocodes timeline 1990–1990 (see eurocodes.jrc.eu.europa.eu)



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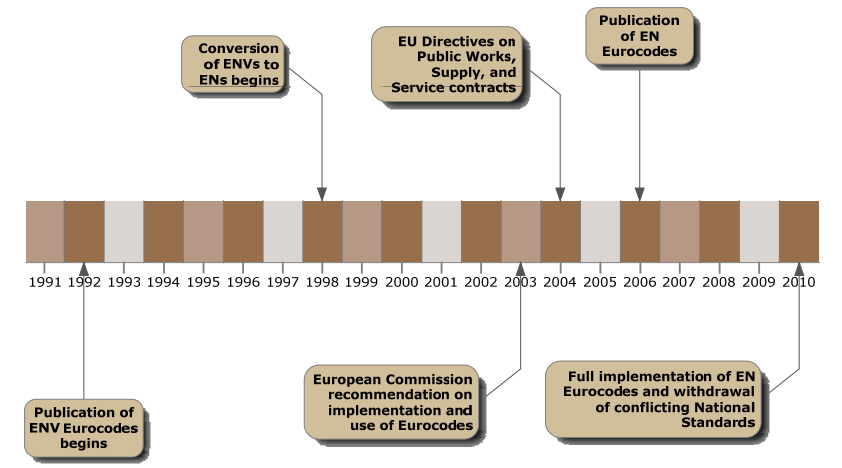
Eurocodes timeline 1991–2010 (see eurocodes.jrc.eu.europa.eu)



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European Commission Mandate M/466 EN issued 19th May 2010

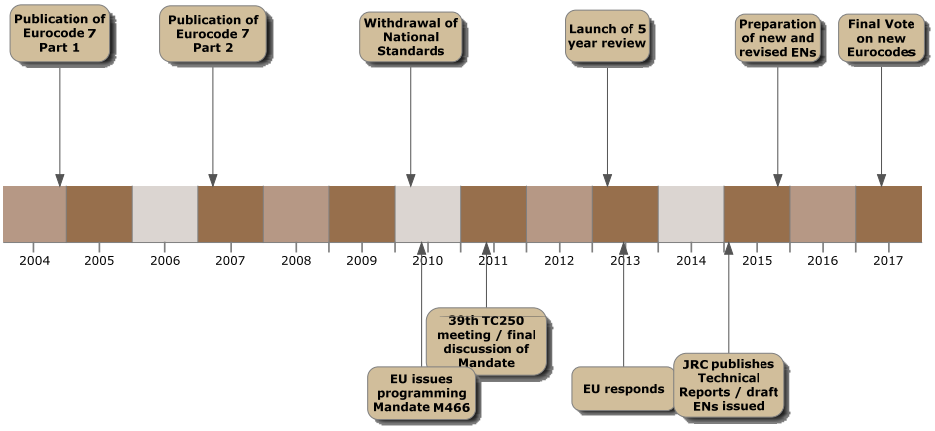
Objective to 'initiate the process of further evolution of the Eurocodes'

1. New Eurocodes or Eurocode parts
   a) Extension of existing rules for the assessment of existing buildings and structures and their strengthening
   b) Design of structures that include structural glass members
   c) Design of structures that include structural members made of fibre reinforced polymers
   d) Design of membrane structures
   e) Extension of existing rules for robustness
2. Further development of the existing Eurocodes ENs 1990-1999

European Commission's targets for further development of existing Eurocodes

a) Assess existing Eurocodes to reduce the number of Nationally Determined Parameters (NDPs)
b) Incorporate recent research on innovation, e.g. performance-based and sustainability concepts
c) Incorporate recent research on sustainability
d) Adopt ISO standards to supplement the Eurocode family, e.g. atmospheric icing of structures and actions from waves and currents on coastal structures
e) Simplify rules, where relevant, for limited and well identified fields of application
f) Facilitate feedback from stakeholders and practical local implementation
g) Consider on going work and results of Mandate 420, CEN/CENELEC Guide 6 and ISO/DIS 21542

Future of the Eurocodes: now-2017



What lessons can be learned from implementeing the Eurocodes? (after Steinar Leivestad, Norway)

- Simplify only to the extent that it can be technically justified
- Say things only once, correct and in the appropriate place
- Apply general principles
- Use shall where we mean shall, following normal ISO/CEN rules (shall/should/may/can)
- Avoid trivial and disputable rules
- Avoid rules of little/no practical use in design
- Let standards for application be down to earth practical
- Reduce number of pages and books [designers have to use]
- Avoid publication of unauthorised 'simplifying standards' that would undermine the Eurocodes

'PraxisRegelnBau' initiative: practical rules for construction

Interest groups in Germany want more practical codes

'We want [this initiative] to be an engine for preparing practical regulations in the building profession. … The current generation of Eurocodes is a good first step … However, there is a second step, [to improve and] to simplify. Only if this second step is done, will the Eurocodes be a success.'

Professor Nußbaumer (Chairman)

Founding members include:

Federal Chamber of Engineers eV, Confederation of German Construction Industry, National Federation of Building Trade, and many others

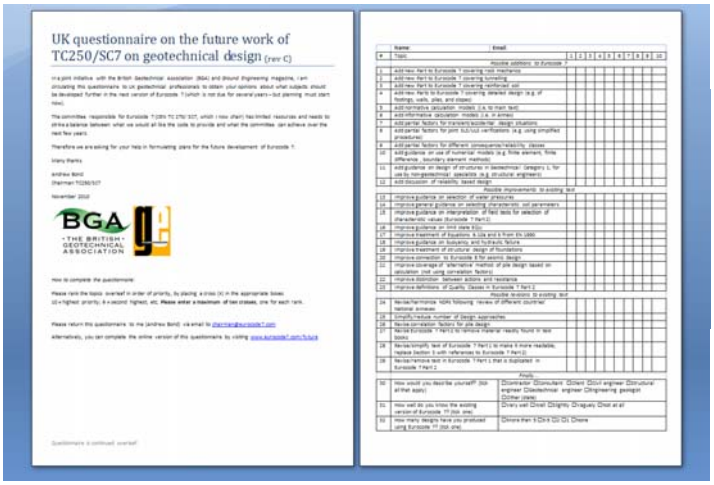
Members admit they did not engage in the process of code development in the past

Questionnaire on the future work of TC250/SC7

Future development of Eurocode 7

BGA Symposium – Eurocode 7 Today and Tomorrow, Cambridge, England, March 2011

Questionnaire circulated through Geocentrix training courses/talks and Ground Engineering


UK questionnaire on the future work of TC250/SC7 on geotechnical design (rev C)

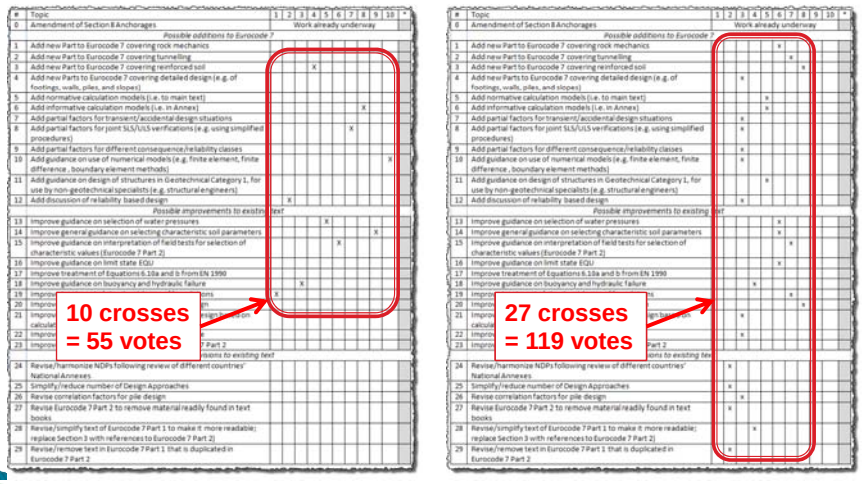
Instructions for completing questionnaire

Please rank the topics overleaf in order of priority, by placing a cross (X) in the appropriate boxes

10 = highest priority; 9 = second highest; etc.

Please enter a maximum of ten crosses, one for each rank

Over half of respondants failed to follow the instructions!



Responses received to date

European responses
- 18 National Standards Bodies

Academic response
- 12 Meeting of Teachers of Geotechnical Subjects

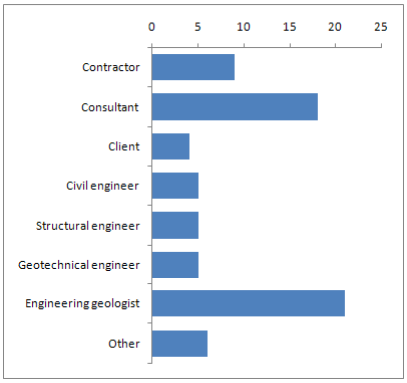
UK industry response
- 69 via Geocentrix training courses
- 64 from BGA Symposium flyer in Ground Engineering
- 133 in total

40 % of today's delegates submitted a response

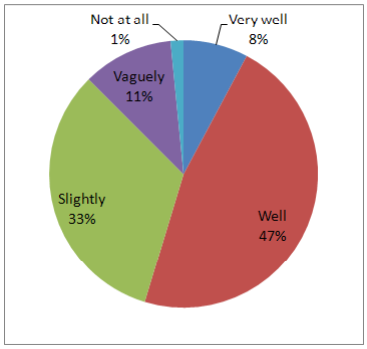
Response from the British geotechnical community

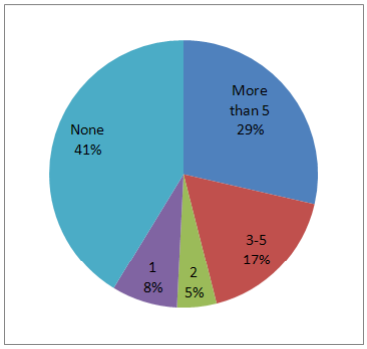
Future development of Eurocode 7

How would you describe yourself?

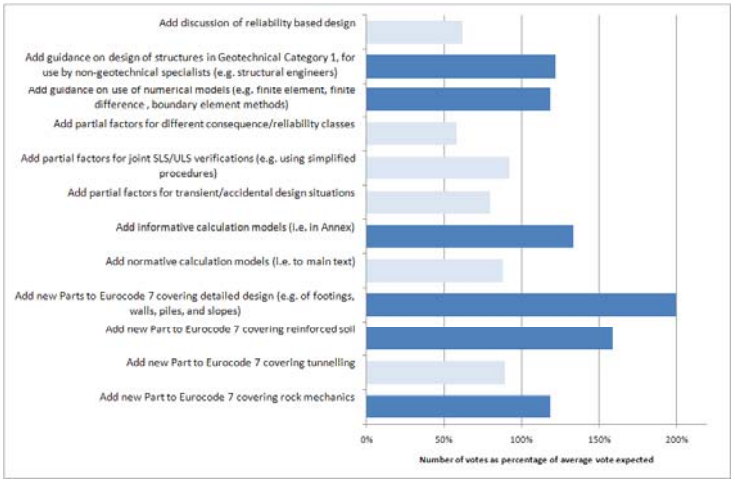


How well do you know Eurocode 7?
How many designs done using Eurocode 7?

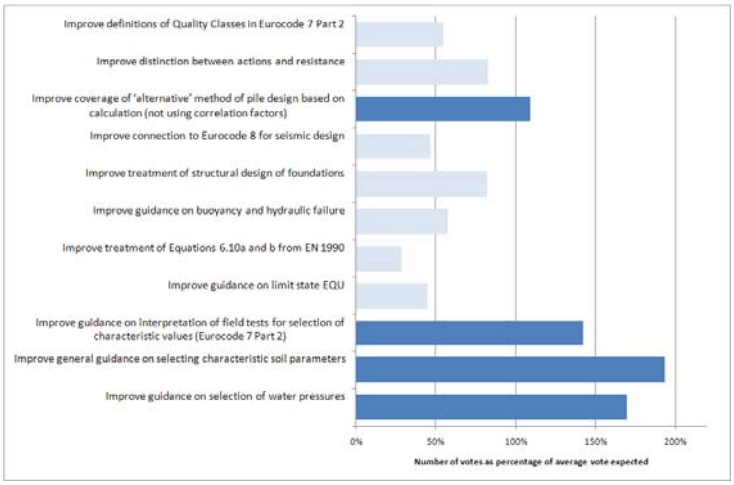




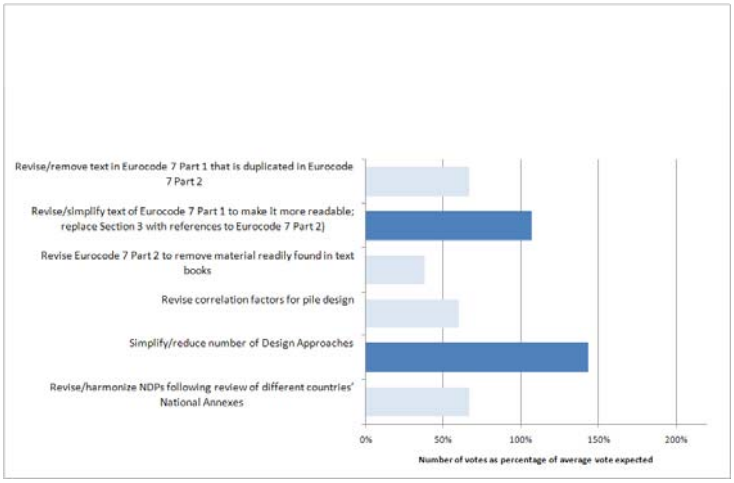
Popularity of 'adding' to Eurocode 7



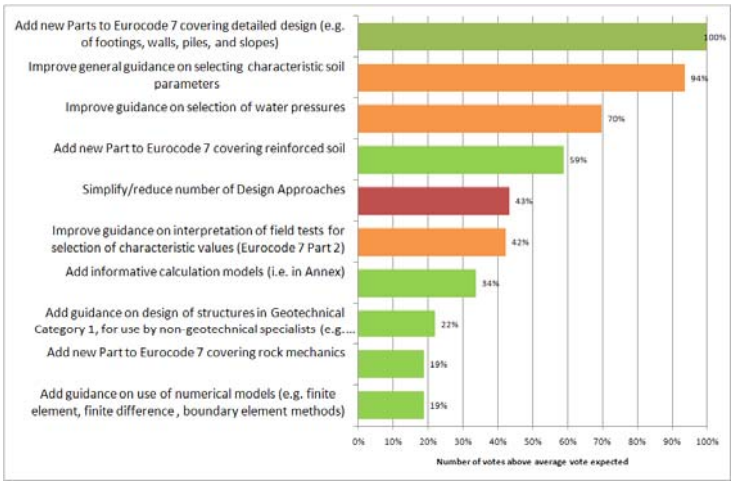
Popularity of 'improving' Eurocode 7



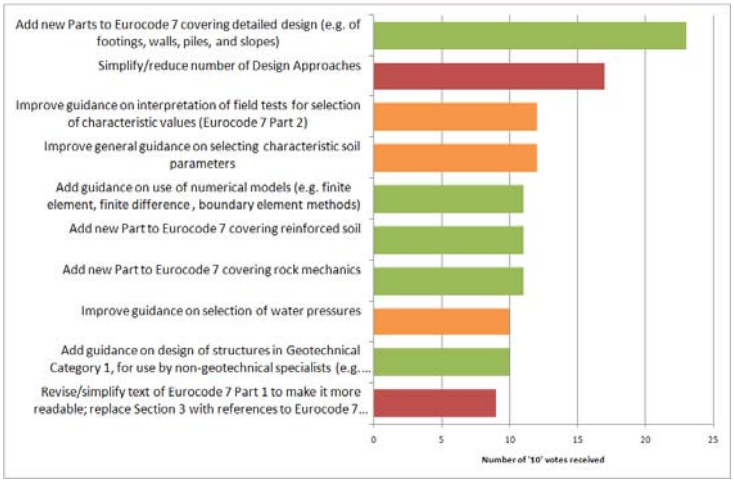
Popularity of 'revising' Eurocode 7



Top 10 topics as voted by UK engineers



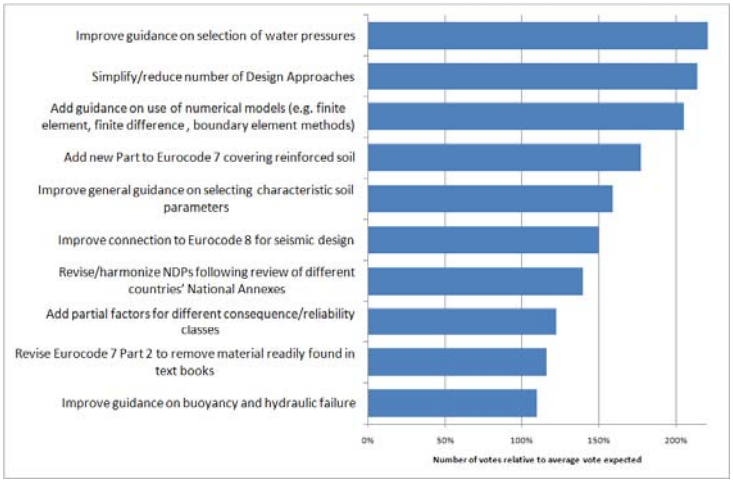
Topics getting '10' vote from UK engineers



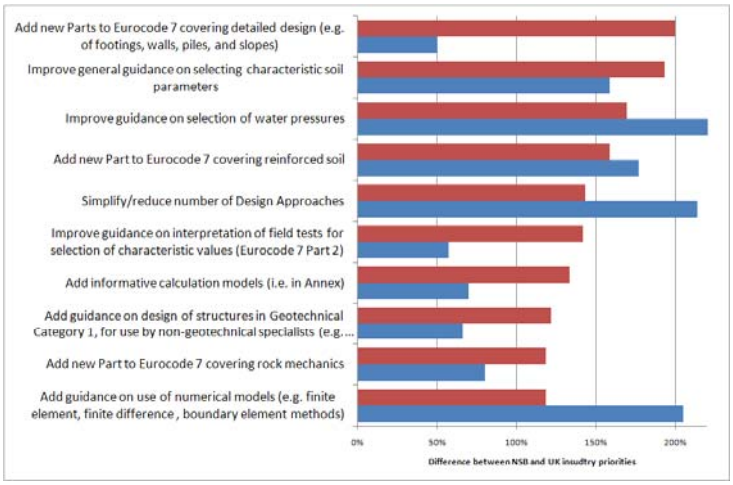
Response from European National Standards Bodies

Future development of Eurocode 7

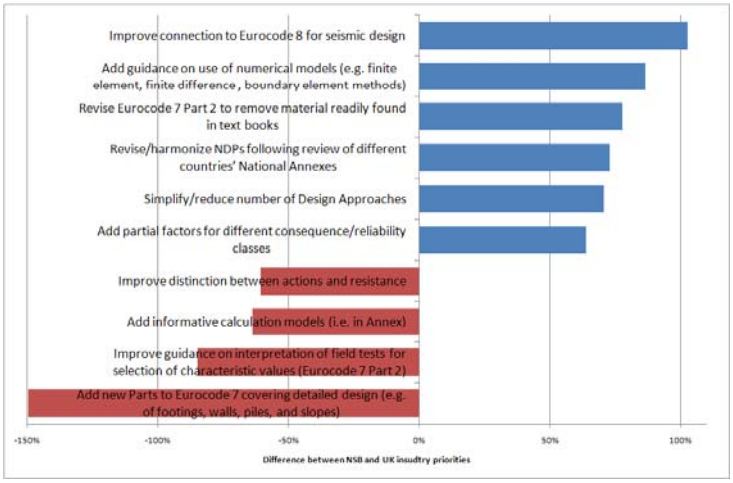
Top 10 topics as voted by National Standards Bodies



UK's top 10 topics as voted by National Standards Bodies



NSB and UK industry priorities compared



Proposal for evolution of EN 1997

Future development of Eurocode 7

SC7's highest priorities for development in next revision of EN 1997

1. Harmonization (see next slide)
2. Incorporation of recent research results and technical studies
   - Add/improve guidance on ground water pressures; numerical models; selection of characteristic parameters; use of EN 1997 with EN 1998 for seismic design
3. Sustainability
   - Remove conservatism from connection with structural Eurocodes; provide better treatment of consequence/ reliability classes
4. New parts to Eurocode 7
   - Covering reinforced soil, rock mechanics, and tunnelling
5. Simplification of rules
   - Revise EN 1997-2 to remove material readily found elsewhere; revise/remove text duplicated across ENs 1997-1 and -2

SC7's hopes for harmonization

1.1. Simplify/reduce number of Design Approaches

Eurocode 7 currently permits designs to be performed using one (or more) of three design approaches (DAs) … These will be simplified and (potentially) reduced based on recent experience of using Eurocode 7.

1.2 Revise/harmonize NDPs following review of countries' National Annexes

Eurocode 7 Part 1 currently includes over 120 NDPs, many of which have had their values adjusted in National Annexes. The project would study all NDPs and reduce their number to an acceptable minimum.

Summary of key points

Future development of Eurocode 7

Summary of key points

Awareness and use of Eurocode 7 is growing

European Commission has issued a Mandate for the 'evolution of the Eurocodes' – response is needed imminently

National Standards Bodies want:

- greater harmonization
- fewer Design Approaches
- better coverage of numerical methods

UK engineers want:

- more detailed guidance on routine calculations
- better guidance on soil characterization
- better guidance on water pressures

What can you do?

'And so, my fellow Europeans: ask not what Eurocode 7 can do for you – ask what you can do for Eurocode 7'

With apologies to John F Kennedy

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