

TC250/SC7/EG 6: Seismic Design

Progress Report No 2 for the period April-Dec 2012

AGREED SCOPE OF WORK

The purpose of EG6 is to advise TC250/SC7 on the interplay between Eurocode 7 and Eurocode 8, specifically of its part 5. The overall aim is to examine geotechnical design as it results from the joint use of the two Eurocodes outlining possible inconsistencies between their respective design principles and evaluating the efficiency and the sustainability of the resulting design in the whole. Specific tasks of this group are the following:

1. prepare a report to SC7 outlining the changes that could be made to Eurocode 7 to improve its application when designing geotechnical structures in seismic environments. Identify the interplay and possible inconsistencies between Eurocodes 7 and 8: by means of practical examples
2. Prepare a list of clauses to be added to Eurocode 7 for both part1 and 2, referring the relevant sections of Eurocode 8
3. To collect and list national procedures for geotechnical design in seismic regions
4. Compare levels of safety explicitly or implicitly adopted by the different countries both for static and seismic conditions.
5. To select and suggest design procedures to evaluate the performance under seismic actions of typical geotechnical structures initially designed for static loadings
6. To prepare charts to anticipate when the seismic case becomes more critical with respect to the static case for the design of any specific geotechnical situation.

KEY ISSUES UNDER DISCUSSION

Practical examples of seismic design of typical geotechnical structures are presently discussed. Examples are worked by different members of EG6 and comparison between solutions are made at the web conferences. Available examples are the following:

- Footing (prepared by Scarpelli)
- Gravity wall (prepared by Peckan and Saglam)
- Cantilever and propped embedded walls (prepared by Pane)

Texts are published on the EG6 webpage.

DECISIONS/OUTCOMES

TC250/SC7/Evolution Groups

- In all of the analyzed cases, the discussion leads to the conclusion that a differentiation between static and seismic partial factors is needed to reach economically sustainable geotechnical design.
- A better calibration of the seismic partial factors may guide designers to benefit of ductility of geotechnical structures by accepting a reasonable level of irreversible displacements and so reducing design values of the seismic acceleration.
- On the other hand, the present separation of static and seismic designs together with the adoption of the same set of partial factors when considering ultimate limit states often leads to geotechnical over dimensioning and sometime, for the rules being adopted by the countries, to insufficient structural design.

Comment [GS1]: Over design ??

When planning future activities on Eurocodes it is strongly recommended a possible repositioning of seismic Eurocode 8-5 within Eurocode 7 to overcome all of the above shortcomings.

MEETINGS HELD/PLANNED

Tele-meeting no.	Date held/scheduled	Available from webpage?
1	18 July 2011	yes
2	11 September	yes
3	30 November	yes
4	26 January 2012	yes
5	21 May	yes
6	24 July	yes
7	11 October	yes
8	4 December	yes
9	21 January 2013, 10:30 CET	

ACTIVE MEMBERSHIP

Name	Position*	Country	Listed on webpage?
Alberto Bernal		Spain	yes

Raffaele di Laora	Secretary	Italy	yes
Amir Kaynia		Norway	yes
Vincenzo Pane		Italy	yes
Achilleas Papadimitriou		Greece	yes
Panicos Papadopoulos		Cyprus	yes
Onur Peckan		Turkey	yes
Alain Pecker		France	yes
Baran Ozsoy		Turkey	yes
Selman Saglam		Turkey	yes
Giuseppe Scarpelli	Convenor	Italy	yes

*please indicate Convenor/Secretary

REPORT PREPARED BY:

Giuseppe Scarpelli

January 3rd, 2013