NATIONAL ANNEX TO CYS EN 1998-4:2006

Eurocode 8: Design of structures for earthquake resistance

Part 4: Silos, tanks and pipelines

CYPRUS ORGANISATION FOR STANDARDISATION

NATIONAL ANNEX

TO

CYS EN 1998-4:2006

Eurocode 8: Design of structures for earthquake resistance Part 4: Silos, tanks and pipelines

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INTRODUCTION

This National Annex has been prepared by the CYS TC 18 National Standardisation Technical Committee of Cyprus Organisation for Standardisation. (CYS)

NA 1 SCOPE

This National Annex is to be used together with CYS EN 1998-4:2006

This National Annex gives:

(a) Nationally determined parameters for the following clauses of CYS EN 1998-4:2006 where National choice is allowed (see Section NA 2)

- 1.1(4)
- 2.1.2(4)P
- 2.1.3(5)P
- 2.1.4(8)
- 2.2(3)
- 2.3.3.3(2)P
- 2.5.2(3)P
- 3.1(2)P
- 4.5.1.3(3)
- 4.5.2.3(2)P

(b) Decisions on the use of the Informative Annexes A and B (see Section NA 3)

(c) References to non-contradictory complementary information to assist the user to apply CYS EN 1998-4:2006. In this National Annex such information is provided for the following clauses in CYS EN 1998-4:2006 (see Section NA 4)

NA 2 NATIONALLY DETERMINED PARAMETERS

NA 2.1 Clause 1.1 (4) Scope of CYS EN 1998-4:2006

For the design of facilities associated with large risks to the population or the environment the recommendations of other National Annexes may be used.

NA 2.2 Clause 2.1.2 (4)P Ultimate limit state

For the ultimate limit state, the value of the reference return period, T_{NCR}, is 475 years.

NA 2.3 Clause 2.1.3 (5)P Damage limitation state

For the damage limitation state, the value of the probability of exceedance, P_{DLR}, is 10% and the return period, T_{DLR}, is 95 years.

NA 2.4 Clause 2.1.4 (8) Reliability differentiation

The value of the importance factor γ_I for silos, tanks and pipelines is:

1. Importance Class I, $\gamma_I = 0,8$
2. Importance Class II, $\gamma_I = 1,0$
3. Importance Class III, $\gamma_I = 1,2$
4. Importance Class IV, $\gamma_I = 1,6$

NA 2.5 Clause 2.2 (3) Reduction factor at damage limitation state

The reduction factor ν that may be applied to the design seismic action is:

1. Importance Class I and II, ν=0,5
2. Importance Class III and IV, ν=0,4

In a specific area a different value of the reduction factor ν may be used if this value is justified by special zoning studies.

NA 2.6 Clause 2.3.3.3 (2)P Foundation damping

The maximum value of radiation damping ξ_{max} for soil-structure interaction analysis is 25%. Further guidance for the selection and use of damping values associated with different foundation motions is provided in the CYS EN 1998-6:2005.

NA 2.7 Clause 2.5.2 (3)P Combination of seismic action with other actions

The value of factor φ that must be multiplied with the combination coefficient ψ_{Ei} is:

1. φ =1 for full silo, tank or pipeline
2. φ =0 for empty silo, tank or pipeline

NA 2.8 Clause 3.1 (2)P Introduction – Unit weights

The unit weights of the particulate solid stored in silos is the upper value of the unit weight listed in the CYS EN 1991-4:2006, Table E1.

For materials not listed in the table thorough tests must be carried out to determine the lower and upper value of the unit weight.

NA 2.9 Clause 4.5.1.3 (3) Piping – amplification factor

The value of the amplification factor γ_{p1} on forces transmitted by the piping to the region of the tank where the piping is attached is γ_{p1}=1,3.

NA 2.10 Clause 4.5.2.3 (2)P Piping – overstrength factor

The value of the overstrength factor γ_{p2} that must be taken into account on the design resistance of the piping is γ_{p2} =1,3.

NA 3 DECISION ON USE OF THE INFORMATIVE ANNEXES A AND B

NA 3.1 Annex A

Annex A may be used

NA 3.2 Annex B

Annex B may be used

NA 4 REFERENCES TO NON-CONTRADICTORY COMPLEMENTARY INFORMATION

None

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CYS EN
1998-4:2006

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