NATIONAL ANNEX

TO

CYS EN 1991-1-4:2005 (Including AC:2010 and A1:2010)

Eurocode 1: Actions on structures

Part 1-4: General Actions – Wind actions

CYPRUS ORGANISATION FOR STANDARDISATION

NATIONAL ANNEX

TO

CYS EN 1991-1-4:2005
(Including AC:2010 and A1:2010)

Eurocode 1: Actions on structures

Part 1-4: General Actions – Wind actions

This National Annex has been approved by the Board of Directors of the Cyprus Organisation for Standardisation (CYS) on 24.01.2020.

Centre of Information and Customer Service
at the Cyprus Organisation for Standardisation
phone: +357 22 411413/4 email: c.service@cys.org.cy

INTRODUCTION

This National Annex has been prepared by the CYS/TC18 Committee of the Cyprus Organization of Standardisation. (CYS)

NA 1 SCOPE

This National Annex is to be used together with CYS EN 1991-1-4:2005 including AC:2010 and A1:2010. Any reference in the rest of this text to CYS EN 1991-1-4:2005 means the above document.

This National Annex gives:

(a) Nationally determined parameters for the following clauses of CYS EN 1991-1-4:2005 including AC:2010 and A1:2010 where National choice is allowed (see Section NA 2)

- 1.5 (2)
- 4.1 (1)
- 4.2 (1)P Note 2
- 4.2 (2)P Notes 1, 2, 3 and 5
- 4.3.1 (1) Notes 1 and 2
- 4.3.2 (1)
- 4.3.2 (2)
- 4.3.3 (1)
- 4.3.4 (1)
- 4.3.5 (1)
- 4.4 (1) Note 2
- 4.5 (1) Notes 1 and 2
- 5.3 (5)
- 6.1 (1)
- 6.3.1 (1) Note 3
- 6.3.2 (1)
- 7.1.2 (2)
- 7.1.3 (1)
- 7.2.1 (1) Note 2
- 7.2.2 (1)
- 7.2.2 (2) Note 1
- 7.2.3 (2)
- 7.2.3 (4)
- 7.2.4 (1)
- 7.2.4 (3)
- 7.2.5 (1)
- 7.2.5 (3)
- 7.2.6 (1)
- 7.2.6 (3)
- 7.2.7
- 7.2.8 (1)
- 7.2.9 (2)
- 7.2.10 (3) Notes 1 and 2
- 7.3 (6)

- 7.4.1 (1)
- 7.4.3 (2)
- 7.6 (1) Note 1
- 7.7 (1) Note 1
- 7.8 (1)
- 7.9.2 (2)
- 7.10 (1) Note 1
- 7.11 (1) Note 2
- 7.13 (1)
- 7.13 (2)
- Table 7.14
- 8.1 (1) Notes 1 and 2
- 8.1 (4)
- 8.1 (5)
- 8.2 (1) Note 1
- 8.3 (1)
- 8.3.1 (2)
- 8.3.2 (1)
- 8.3.3 (1) Note 1
- 8.3.4 (1)
- 8.4.2 (1)
- A.2 (1)
- E.1.3.3 (1)
- E.1.5.1 (1) Notes 1 and 2
- E.1.5.1 (3)
- E.1.5.2.6 (1) Note 1
- E.1.5.3 (2) Note 1
- E.1.5.3 (4)
- E.1.5.3 (6)
- E.3 (2)

(b) Decisions on the use of the Informative Annexes A, B, C, D, E and F (see Section NA 3)

(c) References to non-contradictory complementary information to assist the user to apply CYS EN 1991-1-4:2005 (see Section NA 4).

NA 2 NATIONALLY DETERMINED PARAMETERS

NA 2.1 Clause 1.5 (2) Design Assisted by testing and measurements

No guidance is given.

NA 2.2 Clause 4.1 Basis for calculation

No further information regarding national climate conditions are provided.

NA 2.3 Clause 4.2 Basic values

(1)P Note 2 The isotach contours for the fundamental value of the basic wind velocity $v_{b,0}$ are given in Figure 1

(2)P Note 1 No correction for the altitude is needed

Note 2 The value of the directional factor, c_{dir}, is specified equal to 1.0

Note 3 The value of the season factor, c_{season}, is specified equal to 1.0

Note 5 The value defined for K is 0.2 and that for n is 0,5

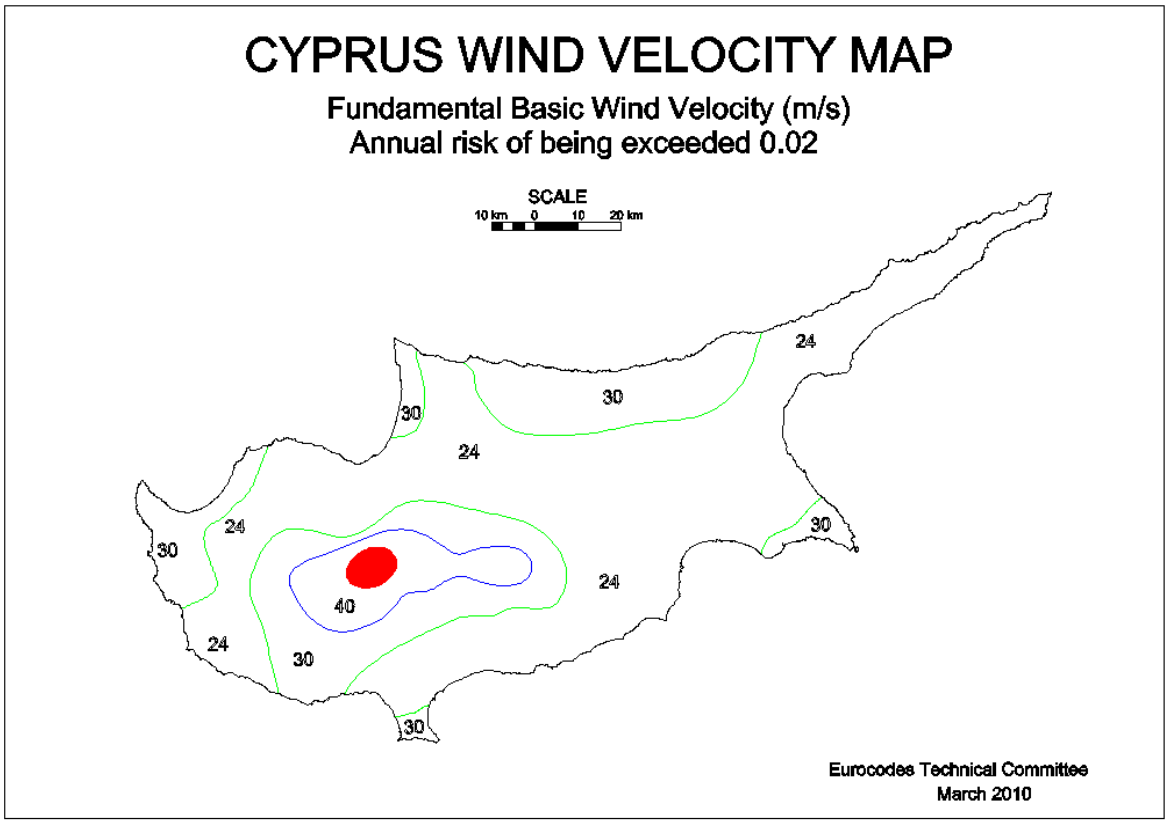

Figure 1: Isotach contours of the fundamental value of the basic wind velocity $v_{b,0}$

NA 2.4 Clause 4.3.1 (1) – Mean wind – Variation with height

Note 1 The orography factor, $c_o(z)$, is taken as 1,0 unless otherwise specified in 4.3.3

Note 2 Design charts or tables for $v_m(z)$ are not provided

NA 2.5 Clause 4.3.2(2) – Mean wind – Terrain roughness

(1) The roughness factor, $c_r(z)$, is determined by equation (4.4) of CYS EN 1991-1-4

(2) The value of the angular sector is defined as the 30º angular sector within ±15º from the wind direction. The upstream distance is obtained from Annex A.2

NA 2.6 Clause 4.3.3 (1) – Mean wind – Terrain orography

The orography factor, c_o, is determined using the procedure of Annex A.3

NA 2.7 Clause 4.3.4 (1) – Mean wind – Large and considerably higher neighbouring structures

The effect of large and considerably higher neighbouring structures on the wind speed may be taken into account using the procedure of Annex A.4

NA 2.8 Clause 4.3.5 (1) – Mean wind – Closely spaced buildings and obstacles

The effect of closely spaced buildings and other obstacles on the wind speed may be taken into account using the procedure of Annex A.5.

NA 2.9 Clause 4.4 (1) –Wind turbulence

The value of the turbulence factor k_I is specified as 1,0

NA 2.10 Clause 4.5 (1) –Peak velocity pressure

Note 1 : The peak velocity pressure $q_p(z)$ at height z, is determined using the equation 4.8 of CYS EN 1991-1-4:2005

Note 2 : The air density, ρ, is specified as 1,25 kg/m^3

NA 2.11 Clause 5.3 (5) – Wind forces

The lack of correlation of wind pressures between windward and leeward sides is considered only for walls (see 7.2.2 (3))

NA 2.12 Clause 6.1 (1) – Structural factor $c_s c_d$ - General

The structural factor $c_s c_d$ should be separated for cases that the conditions of paragraph 6.3.1(2) of CYS EN 1991-1-4are not satisfied, for buildings outside the scope of the code and for components of structures.

NA 2.13 Clause 6.3.1 (1) – Detailed procedure - Structural factor $c_s c_d$

Either of the procedures described in Annexes B or C may be used for the determination of k_p, B and R.

NA 2.14 Clause 6.3.2 (1) – Detailed procedure – Serviceability assessments

Either of the procedures described in Annexes B or C may be used for the determination of the along-wind displacement and the standard deviation of the along-wind acceleration.

NA 2.15 Clause 7.1.2 (2) – Pressure and force coefficients – General – Asymmetric and counteracting pressures and forces

For structures other than free-standing canopies and signboards the procedures *a* and *b* described in paragraph 7.1.2(2) shall be used.

NA 2.16 Clause 7.1.3 (1) – Pressure and force coefficients – General – Effects of ice and snow

No further information is provided.

NA 2.17 Clause 7.2.1 (1) – Pressure coefficients for buildings – General

Note 2: The external pressure coefficient c_{pe}, shall be calculated from the Fig. 7.2 of CYS EN 1991-1-4for loaded areas up to 10 m^2

NA 2.18 Clause 7.2.2 – Pressure coefficients for buildings – Vertical walls of rectangular plan buildings

(1) In the determination of the velocity pressure distribution for leeward wall and sidewalls, the reference height is taken as the height of the building.

(2) The values for $c_{pe,1}$ and $c_{pe,10}$ are given in Table 7.1 of CYS EN 1991-1-4

NA 2.19 Clause 7.2.3 – Pressure coefficients for buildings – Flat Roofs

(2) The roof zones are given by the Fig. 7.6 of CYS EN 1991-1-4

(4) The values of pressure coefficients for each zone are given in the Table 7.2 of CYS EN 1991-1-4

NA 2.20 Clause 7.2.4 – Pressure coefficients for buildings – Monopitch roofs

(1) The roof zones are given in the Fig. 7.7 of CYS EN 1991-1-4.

(3) The values of pressure coefficients for each zone are given in the Tables 7.3a and 7.3b of CYS EN 1991-1-4:2005.

NA 2.21 Clause 7.2.5 – Pressure coefficients for buildings – Duopitch roofs

(1) The roof zones are given in Fig. 7.8 of CYS EN 1991-1-4:2005.

(3) The values of pressure coefficients for each zone are given in the Tables 7.4a and 7.4b of CYS EN 1991-1-4:2005.

NA 2.22 Clause 7.2.6 – Pressure coefficients for buildings – Hipped roofs

(1) The roof zones are given in the Fig. 7.9 of CYS EN 1991-1-4.

(3) The values of pressure coefficients for each zone are given in the Table 7.5 of CYS EN 1991-1-4.

NA 2.23 Clause 7.2.7 –Multispan roofs

No additional Information is provided**.**

NA 2.24 Clause 7.2.8(1) – Pressure coefficients for buildings – Vaulted roofs and domes

No additional information is provided for the values of $c_{pe,10}$ and $c_{pe,1.}$ The values for $c_{pe,10}$ are given in Tables 7.11 and 7.12 of CYS EN 1991-1-4.The reference height should be taken as $h + f$

NA 2.25 Clause 7.2.9(2) – Pressure coefficients for buildings – Internal pressure

No additional information is provided.

NA 2.26 Clause 7.2.10(3) – Pressure coefficients for buildings – Pressure on walls or roofs with more than one skin

Note 1 : The wind pressure on the most rigid skin should be taken as the difference between the internal and the external pressures

Note 2: For the cases where the extremities of the layer between the skins are air tight (Figure 7.14(a)) and where the free distance between the skins is less than 100 mm, the rules of NOTE 2 of Clause 7.2.10(3) shall be applied.

NA 2.27 Clause 7.3 (6) Canopy roofs

For a monopitch canopy the center of pressure (Table 7.6) should be taken as the recommended value of Figure 7.16 of CYS EN 1991-1-4.

NA 2.28 Clause 7.4.1(1) – Free-standing walls, parapets, fences and signboards – Free-standing walls and parapets

The values of the pressure coefficients $c_{p,net}$ for free-standing walls and parapets are given in Table 7.9 of CYS EN 1991-1-4

NA 2.29 Clause 7.4.3(2) – Free-standing walls, parapets, fences and signboards – Signboards

The value of the horizontal eccentricity e is specified as equal to ± 0,25b

NA 2.30 Clause 7.6(1) – Structural elements with rectangular sections

The values of the reduction factor for square sections with rounded corners, ψ_r, are specified in Figure 7.24 of CYS EN 1991-1-4:2005

NA 2.31 Clause 7.7(1) – Structural elements with sharp edged section

The value of $c_{f,0}$ is specified as equal to 2,0 for all elements without free-end flow.

NA 2.32 Clause 7.8(1) – Structural elements with regular polygonal section

The value of force coefficient $c_{f,0}$ is specified in Table 7.11 of CYS EN 1991-1-4

NA 2.33 Clause 7.9.2(2) – Cylindrical cylinders – Force coefficients

No additional information is provided.

NA 2.34 Clause 7.10(1) – Spheres

The values of $c_{f,x}$ are specified in Figure 7.30 of CYS EN 1991-1-4

NA 2.35 Clause 7.11(1) – Lattice structures and scaffoldings

The reduction factor for scaffolding without air tightness devices and affected by solid building obstruction are specified in EN 12811.

NA 2.36 Clause 7.13 – Effective slenderness λ and end-effect factor ψ_λ

(1) No values for the force coefficients are specified that take into account the effect of turbulence.

(2) The values for λ and ψ_λ are specified in Table 7.16 and Figure 7.36 of CYS EN 1991-1-4, respectively.

NA 2.37 Clause 8.1 – Wind actions on bridges - General

(1) Note 1 Wind actions for other types of bridges are not specified.

Note 2 The angle of the wind direction to the deck axis in the vertical and horizontal planes is not specified

(4) The value of $v^*_{b,0}$ is specified equal to 23 m/s

(5) The value of $v^{**}_{b,0}$ is specified equal to 25 m/s

NA 2.38 Clause 8.2(1) – Wind actions on bridges – Choice of the response calculation procedure

No criteria or procedures are specified.

NA 2.39 Clause 8.3(1) – Wind actions on bridges – Force coefficients

The force coefficients for parapets and gantries on bridges are specified in clause 7.4 of CYS EN 1991-1-4:2005.

NA 2.40 Clause 8.3.1(2) – Wind actions on bridges – Force coefficients – Force coefficients in x-direction (general method)

No further specification is made

NA 2.41 Clause 8.3.2(1) – Wind actions on bridges – Force coefficients – Force in x-direction simplified method

The C-values are defined in Table 8.2 of CYS EN 1991-1-4:2005

NA 2.42 Clause 8.3.3(1) – Wind actions on bridges – Force coefficients – Wind forces on bridge decks in z-direction

The force coefficient $c_{f,z}$ is specified as equal to ±0,9

NA 2.43 Clause 8.3.4(1) – Wind actions on bridges – Force coefficients – Wind forces on bridge decks in y-direction

The wind forces in y-direction should be taken as 25% of the wind forces in the x-direction for plated bridges and 50% of the wind forces in the x-direction for truss bridges.

NA 2.44 Clause 8.4.2(1) – Wind actions on bridges – Bridge piers – Wind effects on piers

No simplified rules are specified. For asymmetric loading the procedure of CYS EN 1991-1-4:2005 to be used.

NA 2.45 Clause A.2(1) – Terrain effects – Transition between roughness categories 0, I, II, III and IV

In calculating q_p and $c_s c_d$ the transition between different roughness categories should follow procedure 1 of A.2 of CYS EN 1991-1-4:2005

NA 2.46 Clause E.1.3.3 (1) -Vortex shedding and aeroelastic instabilities-Basic parameters for vortex shedding-Scruton Sc

The air density ρ is specified as 1,25 kg/m^3

NA 2.47 Clause E.1.5.1 – Vortex shedding and aeroelastic instabilities – Calculation of the cross-wind amplitude – General

(1) Note 1: Both of the approaches specified in E.1.5.2 and E.1.5.3 may be used of the calculation of the vortex excited cross-wind amplitudes. The selection of the appropriate procedure shall be based on the recommendations and explanations given in E.1.5.1 (2) and (3).

Note 2: No additional information is provided

(3) No additional information is provided

NA 2.48 Clause E.1.5.2.6(1) – Vortex shedding and aeroelastic instabilities – Calculation of the cross-wind amplitude – Approach 1 – No of load cycles

The minimum value of the number of cycles N that shall be considered is 10^4

NA 2.49 Clause E.1.5.3 – Vortex shedding and aeroelastic instabilities – Calculation of the cross-wind amplitude – Approach 2

(2) The air density ρ is specified as 1,25 kg/m^3

(4) No additional information is provided

(6) The peak factor k_p shall be calculated using equation E.17 of CYS EN 1991-1-4:2005

NA 2.50 Clause E.3(2) – Vortex shedding and aeroelastic instabilities – Interface galloping of two or more free standing cylinders

No additional guidance is provided

NA 3 DECISION ON USE OF THE INFORMATIVE ANNEXES A, B, C, D AND E

NA 3.1 Annex A

Annex A may be used

NA 3.2 Annex B

Annex B may be used

NA 3.3 Annex C

Annex C may be used

NA 3.4 Annex D

Annex D may be used

NA 3.5 Annex E

Annex E may be used

NA 3.6 Annex F

Annex F may be used

NA 4 REFERENCES TO NON-CONTRADICTORY COMPLEMENTARY INFORMATION

None

blank

NA to CYS EN 1991-1-4:2005 (Including AC:2010 and A1:2010)

CYPRUS ORGANISATION FOR STANDARDISATION
Limassol Avenue and Kosta Anaxagora 30,
2nd & 3rd Floor, 2014 Strovolos, Cyprus
P.O.BOX.16197, 2086 Nicosia, Cyprus

Tel: +357 22 411411 Fax: +357 22 411511

E-Mail: cystandards@cys.org.cy

Website: www.cys.org.cy