NA to
CYS EN
1993-1-11:2006
(Including
AC:2009)

NATIONAL ANNEX TO CYS EN 1993-1-11:2006 (Including AC:2009)

Eurocode 3: Design of steel structures

Part 1-11: Design of structures with tension components

CYPRUS ORGANISATION FOR STANDARDISATION

NATIONAL ANNEX

TO

CYS EN 1993-1-11: 2006 + AC:2009
Eurocode 3: Design of steel structures
Part 1-11: Design of structures with tension components

This National Annex has been approved by the Board of Directors of the Cyprus Organisation for Standardisation (CYS) on 14.06.2019.

INTRODUCTION

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

NA 1 SCOPE

This National Annex is to be used together with CYS EN 1993-1-11: 2006+AC:2009. Any reference in the rest of this text to CYS EN 1993-1-11:2006 means the above document.

This National Annex gives:

(a) Nationally determined parameters for the following clauses of CYS EN 1993-1-11: 2006 where National choice is allowed (see Section NA 2):

- 2.3.6(1)
- 2.3.6(2)
- 2.4.1(1)
- 3.1(1)
- 4.4(2)
- 4.5(4)
- 5.2(3)
- 5.3(2)
- 6.2(2)
- 6.3.2(1)
- 6.3.4(1)
- 6.4.1(1)P
- 7.2(2)
- A.4.5.1(1)
- A.4.5.2(1)
- B(6)

(b) Decisions on the use of informative Annexes A, B and C to CYS EN 1993-1-11: 2006 (see Section NA 3).

(c) References to non-contradictory complementary information to assist the user to apply CYS EN 1993-1-11: 2006 (see Section NA 4).

NA 2 NATIONALLY DETERMINED PARAMETERS

NA 2.1 Clause 2.3.6(1) Replacement and loss of tension components

No further information is given on defining transient loading conditions and partial factors for replacement of at least one tension component.

NA 2.2 Clause 2.3.6(2) Replacement and loss of tension components

No further information is given where an accidental design situation of the loss of any tension component should apply or of any protection requirements and loading conditions.

NA 2.3 Clause 2.4.1(1) Transient design situation during the construction phase

The following recommended partial safety factor values for γ_{Gi} are specified as:

$\gamma_G = 1{,}10$ for a short time period (only a few hours) for the installation of first strand in strand by strand installations

$\gamma_G = 1{,}20$ for the installation of other strands

$\gamma_G = 1{,}00$ for favourable effects.

NA 2.4 Clause 3.1(1) Strength of steels and wires

The following recommended maximum values for f_u for durability reasons are specified as::

- steel wires — round wires: nominal tensile strength: 1770 N/mm²
  Z-wires: nominal tensile strength: 1570 N/mm²
- stainless steel wires: round wires: nominal tensile strength: 1450 N/mm²

NA 2.5 Clause 4.4(2) Corrosion protection of the exterior of Group B tension components

No corrosion resistance classes are specified.

NA 2.6 Clause 4.5(4) Corrosion protection of Group C tension components

No further guidance is provided on the choice of acceptable fillers.

NA 2.7 Clause 5.2(3) Transient construction phase

The recommended value of partial factor γ_P is 1,00..

NA 2.8 Clause 5.3(2) Persistent design situation during service

No further guidance is given where outside the scope of EN 1993 the partial factor γ_G to "G + P" may be used.

NA 2.9 Clause 6.2(2) Pre-stressing bars and Group B and C components

The partial factor value γ_R is dependent on whether or not measures are applied at the rope ends to reduce bending moments from cable rotations, see 7.1(4) CYS EN 1993-1-11: 2006. The recommended partial factor values for γ_R are specified in Table 2.1 (CYS) of CYS EN 1993-1-11: 2006.

Table 2.1 (CYS): Partial factor γ_R – values

Measures to minimise bending stresses at the anchorage	γ_R
Yes	0,90
No	1,00

NA 2.10 Clause 6.3.2(1) Slipping of cables over saddles

The recommended partial factor value of γ_{Mfr} is 1,65..

NA 2.11 Clause 6.3.4(1) Design of saddles

The recommended value of k is 1,10.

NA 2.12 Clause 6.4.1(1)P Slipping of clamps

The recommended partial factor value of $\gamma_{M,fr}$ is 1,65.

NA 2.13 Clause 7.2(2) Stress Limits

The recommended stress limits f_{const} are specified in Table 2.2 (CYS) for the construction phase and the recommended stress limits f_{SLS} are specified in Table 2.3 (CYS) of CYS EN 1993-1-11: 2006 for service conditions.

Table 2.2 (CYS): Stress limits f_{const} for the construction phase

Stage of installation	$f_{const.}$
First tension components for only a few hours	0,60 σ_{uk}
After installment of other tension components	0,55 σ_{uk}

The stress limits follow from

$$f_{const} = \frac{\sigma_{uk}}{1{,}50\gamma_R\gamma_F} = \frac{0{,}66\,\sigma_{uk}}{\gamma_R\gamma_F} \qquad (2.1)$$

With $\gamma_R \times \gamma_F = 1{,}0 \times 1{,}10 = 1{,}10$ for short term situations

$\gamma_R \times \gamma_F = 1{,}0 \times 1{,}20 = 1{,}20$ for long term situations

Table 2.3 (CYS): Stress limits f_{SLS} for service conditions

Loading conditions	f_{SLS}
Fatigue design including bending stresses *)	0,50 σ_{uk}
Fatigue design without bending stresses	0,45 σ_{uk}
*) Bending stresses may be reduced by detailing measures, see 7.1(2) CYS EN 1993-1-11: 2006.	

The stress limits follow from

$$f_{SLS} = \frac{\sigma_{uk}}{1{,}50\,\gamma_R\gamma_F} = \frac{0{,}66\,\sigma_{uk}}{\gamma_R\gamma_F} \qquad (2.2)$$

with $\gamma_R \times \gamma_F = 0{,}9 \times 1{,}48 = 1{,}33$ with bending stresses

$\gamma_R \times \gamma_F = 1{,}0 \times 1{,}48 = 1{,}48$ without bending stresses

where $\gamma_F \approx \gamma_Q = 1{,}50 \approx 1{,}48$

The stress limit $f_{SLS} = 0{,}45\ \sigma_{uk}$ is used for testing, see Annex A of CYS EN 1993-1-11: 2006.

NA 2.14 Clause A.4.5.1(1) Waterproofing

No further details are given for tests.

NA 2.15 Clause A.4.5.2(1) Corrosion protection of barriers

No further details are given for tests.

NA 2.16 Clause B(6) Transport, storage, handling

No further guidance is given on monitoring and inspections.

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

NA 3.1 Annex A

Informative Annex A may be used.

NA 3.2 Annex B

Informative Annex B may be used.

NA 3.3 Annex C

Informative Annex C may be used.

NA 4 REFERENCES TO NON-CONTRADICTORY COMPLEMENTARY INFORMATION

None

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NA to CYS EN 1993-1-11:2006 (Including AC:2009)

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