



## Theoretical Background

National Annexes to EN 1992

**SCiAENGINEER**

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## Version Information

Welcome to the Theoretical Background for National Annexes to EN 1992.

This document provides background information regarding the application of NDP items according to different countries.

In addition, this document also contains non-contradictory complementary information (NCI) for the application of EN 1992-1-1 which are used in Scia Engineer.

### Version info

Document Title	Theoretical Background – National Annexes to EN 1992
Release	17.1
Revision	07/2017

## Introduction

In this Theoretical background in depth information is given regarding the application of National Annexes to EN 1992 for different countries.

More specifically this concerns the following codes:

Eurocode 2  
Design of concrete structures  
Part 1-1: General rules and rules for buildings  
EN 1992-1-1:2004  
Corrigendum EN 1992-1-1:2004/AC:2008-01  
Corrigendum EN 1992-1-1:2004/AC:2010-11

Eurocode 2  
Design of concrete structures  
Part 1-2: General rules – Structural fire design  
EN 1992-1-2:2004  
Corrigendum EN 1992-1-2:2004/AC:2008

Eurocode 2  
Design of concrete structures  
Concrete bridges – Design and detailing rules  
EN 1992-2:2005  
Corrigendum EN 1992-2:2005/AC:2008

The first chapter gives an overview of all NDP articles given in EN 1992 and specifies which of those articles are supported by Scia Engineer.

The subsequent chapters provide details on the specific implementation of the supported articles for different countries.

## List of supported national annexes

This chapter provides brief list of supported national annexes to give quick overview.

	EN 1992-1-1	EN 1992-1-2	EN 1992-2
Austria	✓	✓	✓
Belgium	✓	✓	
United Kingdom	✓	✓	✓
Cyprus			✓
Czech Republic	✓	✓	✓
Denmark			
Netherlands	✓	✓	✓
Finland	✓	✓	✓
France	✓	✓	✓
Germany	✓	✓	
Greece	✓	✓	✓
Ireland	✓	✓	✓
Italy			
Luxembourg	✓	✓	✓
Malaysia	✓		
Norway	✓	✓	
Poland	✓	✓	✓
Romania	✓		
Singapore	✓		
Slovakia	✓	✓	✓
Slovenia	✓		
Spain	✓		
Sweden	✓	✓	✓

## National Choice in EN 1992

This chapter specifies the articles of EN 1992 in which a national choice is allowed. In addition, for each article information is given if the article is supported within Scia Engineer.

### EN 1992-1-1

Article	Commentary
2.3.3 (3)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
2.4.2.1 (1)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
2.4.2.2 (1)	The NA may define the partial factor for prestress for favourable actions <i>NA data supported in Scia Engineer</i>
2.4.2.2 (2)	The NA may define the partial factor for prestress for unfavourable actions <i>NA data supported in Scia Engineer</i>
2.4.2.2 (3)	The NA may define the partial factor for prestress for unfavourable actions on local effects <i>No default implementation/Not supported for Scia Engineer</i>
2.4.2.3 (1)	The NA may define the partial factor for fatigue loads <i>No default implementation/Not supported for Scia Engineer</i>
2.4.2.4 (1)	The NA may define the partial factors for materials for ultimate limit states <i>NA data supported in Scia Engineer</i>
2.4.2.4 (2)	The NA may define the partial factors for materials for serviceability limit states <i>No default implementation/Not supported for Scia Engineer</i>
2.4.2.5 (2)	The NA may define the partial factors for materials for foundations <i>No default implementation/Not supported for Scia Engineer</i>
3.1.2 (2)P	The NA may define the value of maximal allowed concrete class <i>NA data supported in Scia Engineer</i>
3.1.2 (4)	The NA may define the partial factors for materials for foundations <i>No default implementation/Not supported for Scia Engineer</i>



3.1.6 (1)P	The NA may define the partial safety factor for concrete and the coefficient taking account of long term effects on the compressive strength <i>NA data supported in Scia Engineer</i>
3.1.6 (2)P	The NA may define the partial safety factor for concrete and the coefficient taking account of long term effects on the tensile strength <i>NA data supported in Scia Engineer</i>
3.2.2 (3)P	The NA may define the value of maximal allowed yield strength of reinforcement <i>NA data supported in Scia Engineer</i>
3.2.7 (2)	The NA may define the value of strain limit <i>NA data supported in Scia Engineer</i>
3.3.4 (5)	The NA may define the limit for assumption of adequate ductility in tension <i>NA data supported in Scia Engineer</i>
3.3.6 (7)	The NA may define the value of strain limit and ratio of limit design values of steel stress <i>NA data supported in Scia Engineer</i>
4.4.1.2 (3)	The NA may define the values of minimum cover due to bond requirement <i>NA data supported in Scia Engineer</i>
4.4.1.2 (5)	The NA may define the values of minimum cover due to environmental conditions <i>NA data supported in Scia Engineer</i>
4.4.1.2 (6)	The NA may define the value of additive safety element for minimum cover <i>NA data supported in Scia Engineer</i>
4.4.1.2 (7)	The NA may define the value of reduction of minimum cover for use of stainless steel <i>NA data supported in Scia Engineer</i>
4.4.1.2 (8)	The NA may define the values of reduction of minimum cover for use of additional protection <i>NA data supported in Scia Engineer</i>
4.4.1.2 (13)	The NA may define the values of increasing the concrete cover due to abrasion <i>NA data supported in Scia Engineer</i>

4.4.1.3 (1)P	The NA may define the values of increasing the concrete cover due to deviation <i>NA data supported in Scia Engineer</i>
4.4.1.3 (3)	The NA may define the values of decreasing deviation in certain situations <i>NA data supported in Scia Engineer</i>
4.4.1.3 (4)	The NA may define the values of increasing the concrete cover due to cast against uneven surfaces <i>NA data supported in Scia Engineer</i>
5.1.3 (1)P	The NA may define the method for simplification in the number of load arrangements <i>No default implementation/Not supported for Scia Engineer</i>
5.2 (5)	The NA may define the value of basic inclination <i>NA data supported in Scia Engineer</i>
5.5 (4)	The NA may define the values of coefficients for determination if redistribution of bending moments without explicit check on the rotation capacity can be used <i>NA data supported in Scia Engineer</i>
5.6.3 (4)	The NA may define the basic value of allowable rotation for plastic rotation capacity calculation <i>No default implementation/Not supported for Scia Engineer</i>
5.8.3.1 (1)	The NA may define the value of limit slenderness for isolated members <i>NA data supported in Scia Engineer</i>
5.8.3.3 (1)	The NA may define the factor for determination if global second order effects in buildings may be ignored <i>No default implementation/Not supported for Scia Engineer</i>
5.8.3.3 (2)	The NA may define the factor for determination if global second order effects in buildings may be ignored if bracing members are uncracked in ultimate limit state <i>No default implementation/Not supported for Scia Engineer</i>
5.8.5 (1)	The NA may define the simplified method for analysis <i>No default implementation/Not supported for Scia Engineer</i>
5.8.6 (3)	The NA may define the partial factor for general method <i>No default implementation/Not supported for Scia Engineer</i>
5.10.1 (6)	The NA may define the method for avoid to brittle failure

	<i>No default implementation/Not supported for Scia Engineer</i>
5.10.2.1 (1)P	The NA may define the factors for maximum stress applied to the tendon <i>NA data supported in Scia Engineer</i>
5.10.2.1 (2)	The NA may define the factors for increasing the maximum stress applied to the tendon <i>NA data supported in Scia Engineer</i>
5.10.2.2 (4)	The NA may define the factors of minimum strength of the concrete at the time <i>No default implementation/Not supported for Scia Engineer</i>
5.10.2.2 (5)	The NA may define the factor for increasing the maximum concrete compressive stress <i>NA data supported in Scia Engineer</i>
5.10.3 (2)	The NA may define the factors for maximum stress in prestressing reinforcement <i>NA data supported in Scia Engineer</i>
5.10.8 (2)	The NA may define the value of the increase of the stress from the effective prestress to the stress in the ultimate limit state <i>No default implementation/Not supported for Scia Engineer</i>
5.10.8 (3)	The NA may define the partial safety factors for the design value of the stress increase <i>No default implementation/Not supported for Scia Engineer</i>
5.10.9 (1)P	The NA may define the partial safety factors for the characteristic values of the prestressing forces at the serviceability limit state <i>NA data supported in Scia Engineer</i>
6.2.2 (1)	The NA may define the values for the shear resistance without shear reinforcement <i>NA data supported in Scia Engineer</i>
6.2.2 (6)	The NA may define the value for the limitation of the shear force <i>NA data supported in Scia Engineer</i>
6.2.3 (2)	The NA may define the limiting values for the angle between the concrete compression strut and the beam axis perpendicular to the shear force <i>NA data supported in Scia Engineer</i>

6.2.3 (3)	The NA may define the values for the shear resistance with shear reinforcement <i>NA data supported in Scia Engineer</i>
6.2.4 (4)	The NA may define the limiting values for the angle between the concrete compression strut in the flange and the beam axis perpendicular to the shear force <i>NA data supported in Scia Engineer</i>
6.2.4 (6)	The NA may define the factor for the decision if extra reinforcement for shear is required <i>NA data supported in Scia Engineer</i>
6.4.3 (6)	The NA may define the factors for the design value of punching shear stress <i>NA data supported in Scia Engineer</i>
6.4.4 (1)	The NA may define the values for the shear resistance of slabs and column bases without shear reinforcement <i>NA data supported in Scia Engineer</i>
6.4.5 (3)	The NA may define the values for the maximum shear resistance of slabs and column bases without shear reinforcement <i>NA data supported in Scia Engineer</i>
6.4.5 (4)	The NA may define the factor for distance of shear reinforcement from the outermost perimeter <i>No default implementation/Not supported for Scia Engineer</i>
6.5.2 (2)	The NA may define the values for the design compressive strength for concrete struts <i>NA data supported in Scia Engineer</i>
6.5.4 (4)	The NA may define the factor for the design compressive strength for concrete struts within nodes <i>NA data supported in Scia Engineer</i>
6.5.4 (6)	The NA may define the factor for the design compressive strength for concrete struts within triaxially compressed nodes <i>No default implementation/Not supported for Scia Engineer</i>
6.8.4 (1)	The NA may define the partial factor for the fatigue verification <i>No default implementation/Not supported for Scia Engineer</i>
6.8.4 (5)	The NA may define the factor for the reduction of the stress exponent for straight and bent bars <i>No default implementation/Not supported for Scia Engineer</i>

6.8.6 (1)	The NA may define the limit for the stress range under frequent cyclic load for fatigue resistance of the unwelded reinforcing bars under tension <i>No default implementation/Not supported for Scia Engineer</i>
6.8.6 (3)	The NA may define the limit for the stress range under frequent cyclic load for fatigue resistance of the welded reinforcing bars under tension <i>No default implementation/Not supported for Scia Engineer</i>
6.8.7 (1)	The NA may define the number of cycles for fatigue resistance for concrete under compression <i>No default implementation/Not supported for Scia Engineer</i>
7.2 (2)	The NA may define the factor for limit of the compressive stress in areas exposed to environments of exposure classes XD, XF and XS <i>NA data supported in Scia Engineer</i>
7.2 (3)	The NA may define the factor for limit of the compressive stress if linear or non-linear creep should be considered <i>NA data supported in Scia Engineer</i>
7.2 (5)	The NA may define the factors for limit of the stress in concrete <i>NA data supported in Scia Engineer</i>
7.3.1 (5)	The NA may define the values for limit of the crack width <i>NA data supported in Scia Engineer</i>
7.3.2 (4)	The NA may define the value for limit tensile stress in concrete in prestress members <i>No default implementation/Not supported for Scia Engineer</i>
7.3.4 (3)	The NA may define the coefficient for final crack spacing <i>NA data supported in Scia Engineer</i>
7.4.2 (2)	The NA may define the factor to take into account the different structural systems and span/effective depth ratios <i>No default implementation/Not supported for Scia Engineer</i>
8.2 (2)	The NA may define the values for spacing of bars <i>NA data supported in Scia Engineer</i>
8.3 (2)	The NA may define the values for mandrel diameter for bent bars <i>NA data supported in Scia Engineer</i>

8.6 (2)	The NA may define the value for anchorage capacity of welded transverse bar <i>No default implementation/Not supported for Scia Engineer</i>
8.8 (1)	The NA may define the value of larger diameter <i>No default implementation/Not supported for Scia Engineer</i>
9.2.1.1 (1)	The NA may define the value for minimal of longitudinal tension reinforcement area <i>NA data supported in Scia Engineer</i>
9.2.1.1 (3)	The NA may define the value for maximal of longitudinal reinforcement area <i>NA data supported in Scia Engineer</i>
9.2.1.2 (1)	The NA may define the factor for minimal of longitudinal reinforcement area in section at support <i>NA data supported in Scia Engineer</i>
9.2.1.4 (1)	The NA may define the factor for minimal of longitudinal reinforcement area in section at support <i>No default implementation/Not supported for Scia Engineer</i>
9.2.2 (4)	The NA may define the factor for shear reinforcement in the form of links <i>No default implementation/Not supported for Scia Engineer</i>
9.2.2 (5)	The NA may define the value for minimal ratio of shear reinforcement <i>NA data supported in Scia Engineer</i>
9.2.2 (6)	The NA may define the value for the maximum longitudinal spacing between shear assemblies <i>NA data supported in Scia Engineer</i>
9.2.2 (7)	The NA may define the value for the maximum longitudinal spacing of bent-up bars <i>No default implementation/Not supported for Scia Engineer</i>
9.2.2 (8)	The NA may define the value for the maximum transverse spacing of the legs in series of shear links <i>NA data supported in Scia Engineer</i>
9.3.1.1(3)	The NA may define the value for maximal spacing of bars in the slab <i>NA data supported in Scia Engineer</i>
9.5.2 (1)	The NA may define the value for minimal diameter of longitudinal bars in the column

	<i>NA data supported in Scia Engineer</i>
9.5.2 (2)	The NA may define the value for minimal longitudinal reinforcement area in the column <i>NA data supported in Scia Engineer</i>
9.5.2 (3)	The NA may define the value for maximal longitudinal reinforcement area in the column <i>NA data supported in Scia Engineer</i>
9.5.3 (3)	The NA may define the value for the maximum spacing of the transverse reinforcement along the column <i>NA data supported in Scia Engineer</i>
9.6.2 (1)	The NA may define the values for minimal and maximal vertical reinforcement area in the wall <i>NA data supported in Scia Engineer</i>
9.6.3 (1)	The NA may define the value for minimal horizontal reinforcement area in the wall <i>NA data supported in Scia Engineer</i>
9.7 (1)	The NA may define the value for minimal orthogonal reinforcement mesh area in the deep beam <i>NA data supported in Scia Engineer</i>
9.8.1 (3)	The NA may define the value for the minimum bar diameter in the pile cap <i>No default implementation/Not supported for Scia Engineer</i>
9.8.2.1 (1)	The NA may define the value for the minimum bar diameter in the column and wall footings <i>No default implementation/Not supported for Scia Engineer</i>
9.8.3 (1)	The NA may define the value for the minimum bar diameter in the tie beam <i>No default implementation/Not supported for Scia Engineer</i>
9.8.3 (2)	The NA may define the value of the minimum downward load in the tie beam <i>No default implementation/Not supported for Scia Engineer</i>
9.8.4 (1)	The NA may define the value for the minimum bar diameter in the column footing on the rock and minimal ground pressure in the ultimate state <i>No default implementation/Not supported for Scia Engineer</i>
9.8.5 (3)	The NA may define the value of the minimum longitudinal reinforcement area in bored piles

	<i>No default implementation/Not supported for Scia Engineer</i>
9.10.2.2 (2)	The NA may define the values of the tensile force in peripheral ties <i>No default implementation/Not supported for Scia Engineer</i>
9.10.2.3 (3)	The NA may define the value of the tensile force in internal ties <i>No default implementation/Not supported for Scia Engineer</i>
9.10.2.3 (4)	The NA may define the values of the minimum force on internal beam line <i>No default implementation/Not supported for Scia Engineer</i>
9.10.2.4 (2)	The NA may define the values of the tensile force in horizontal ties <i>No default implementation/Not supported for Scia Engineer</i>
11.3.5 (1)P	The NA may define the coefficient taking account of long term effects on the compressive strength for lightweight aggregate concrete <i>No default implementation/Not supported for Scia Engineer</i>
11.3.5 (2)P	The NA may define the coefficient taking account of long term effects on the tensile strength for lightweight aggregate concrete <i>No default implementation/Not supported for Scia Engineer</i>
11.3.7 (1)	The NA may define the factor for increasing characteristic strength of lightweight confined concrete <i>No default implementation/Not supported for Scia Engineer</i>
11.6.1 (1)	The NA may define the values for shear resistance of lightweight concrete without shear reinforcement <i>No default implementation/Not supported for Scia Engineer</i>
11.6.2 (1)	The NA may define the reduction factor for the crushing resistance of the concrete struts <i>No default implementation/Not supported for Scia Engineer</i>
11.6.4.1 (1)	The NA may define the values for punching shear resistance of lightweight concrete without shear reinforcement <i>No default implementation/Not supported for Scia Engineer</i>
12.3.1 (1)	The NA may define the coefficient taking account of long term effects on the compressive and tensile strength for plain concrete <i>NA data supported in Scia Engineer</i>



12.6.3 (2)	The NA may define the coefficient for design stress for plain concrete <i>NA data supported in Scia Engineer</i>
A.2.1 (1)	The NA may define the reduced partial safety factor for reinforcement based on reduced deviations <i>No default implementation/Not supported for Scia Engineer</i>
A.2.1 (2)	The NA may define the reduced partial safety factor for concrete based on quality control reduced deviations <i>No default implementation/Not supported for Scia Engineer</i>
A.2.2 (1)	The NA may define the reduced partial safety factors for reinforcement based on using reduced or measured geometrical data in design <i>No default implementation/Not supported for Scia Engineer</i>
A.2.2 (2)	The NA may define the reduced partial safety factor for concrete based on using reduced or measured geometrical data in design <i>No default implementation/Not supported for Scia Engineer</i>
A.2.3 (1)	The NA may define the conversion factor and the reduced partial safety factor for concrete strength in finished structure <i>No default implementation/Not supported for Scia Engineer</i>
C.1 (1)	The NA may define the values for properties of reinforcement suitable for use with this Eurocode <i>No default implementation/Not supported for Scia Engineer</i>
C.1 (3)	The NA may define the values for properties of reinforcement for individual tests <i>No default implementation/Not supported for Scia Engineer</i>
E.1 (2)	The NA may define the values for indicative strength classes for durability <i>No default implementation/Not supported for Scia Engineer</i>
J.1 (2)	The NA may define the values for minimal area of surface reinforcement <i>No default implementation/Not supported for Scia Engineer</i>
J.2.2 (2)	The NA may define the value for limit $\tan\theta$ in frame corners <i>No default implementation/Not supported for Scia Engineer</i>
J.3 (2)	The NA may define the factor for closed horizontal or inclined reinforcement in short corbel <i>No default implementation/Not supported for Scia Engineer</i>

J.3 (3)	The NA may define the factor for closed vertical or inclined reinforcement in short corbel <i>No default implementation/Not supported for Scia Engineer</i>
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**EN 1992-1-2**

Article	Commentary
2.1.3 (2)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
2.3 (2)P	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
3.2.3 (5)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
3.3.3 (1)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
4.1 (1)P	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
4.5.1 (2)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
5.2 (3)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
5.3.2 (2)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
5.6.1 (1)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
5.7.3 (2)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.1 (5)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>

6.2 (2)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.3.1 (1)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.4.2.1 (3)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.4.2.2 (2)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>

## EN 1992-2

Article	Commentary
3.1.2 (102)P	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
3.1.6 (101)P	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
3.1.6 (102)P	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
3.2.4 (101)P	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
4.2 (105)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
4.2 (106)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
4.4.1.2 (109)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
5.1.3 (101)P	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>

5.2 (105)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
5.3.2.2 (104)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
5.5 (104)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
5.7 (105)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.1 (109)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.1 (110)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.2.2 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.2.3 (103)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.2.3 (107)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.2.3 (109)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.8.1 (102)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
6.8.7 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
7.2 (102)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis

	<i>No default implementation/Not supported for Scia Engineer</i>
7.3.1 (105)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
7.3.3 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
7.3.4 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
8.9.1 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
8.10.4 (105)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
8.10.4 (107)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
9.1 (103)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
9.2.2 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
9.5.3 (101)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>
9.7 (102)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
9.8.1 (103)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
11.9 (101)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>

113.2 (102)	The NA may define the distance of provided joints for neglect the temperature and shrinkage effects in global analysis <i>No default implementation/Not supported for Scia Engineer</i>
113.3.2 (103)	The NA may define the partial factor for shrinkage action <i>NA data supported in Scia Engineer</i>

## National Annexes

This chapter provides details on the specific implementation of the supported articles for different countries. Only those items for which a country differs from the default EN are elaborated. For more information reference is made to the EN code and the respective National Annex documents.

### EN 1992-1-1

#### Austria

According to Austrian National annex ÖNORM EN 1992-1-1/NA: 2007-02-01  
 ÖNORM EN 1992-1-1/NA: 2011-12-01  
 ENTWURF ÖNORM EN 1992-1-1/NA:2016-08

Article	Commentary																		
2.4.2.1 (1)	<i>Using the default EN</i>																		
2.4.2.2 (1)	<i>Using the default EN</i>																		
2.4.2.2 (2)	<i>Using the default EN</i>																		
2.4.2.4 (1)	<i>Using the default EN</i>																		
3.1.2 (2)P	<i>Using the default EN</i>																		
3.1.6 (1)P	<i>Using the default EN</i>																		
3.1.6 (2)P	<i>Using the default EN</i>																		
3.2.2 (3)P	<i>Using the default EN</i>																		
3.2.7 (2)	<i>Using the default EN</i>																		
3.3.4 (5)	<i>Using the default EN</i>																		
3.3.6 (7)	<i>Using the default EN</i>																		
4.4.1.2 (3)	<i>Using the default EN</i>																		
4.4.1.2 (5)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p><i>For non-prestress concrete</i></p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="4">Exposure class</th> </tr> <tr> <th colspan="2">Criteria</th> <th>XC1</th> <th>XC2/XC3/XC4</th> <th>XD1/XD2</th> <th>XD3</th> </tr> </thead> <tbody> <tr> <td><math>c_{min,dur}</math></td> <td>[mm]</td> <td>15</td> <td>25</td> <td>30</td> <td>40</td> </tr> </tbody> </table> <p><i>For prestress concrete</i></p>			Exposure class				Criteria		XC1	XC2/XC3/XC4	XD1/XD2	XD3	$c_{min,dur}$	[mm]	15	25	30	40
		Exposure class																	
Criteria		XC1	XC2/XC3/XC4	XD1/XD2	XD3														
$c_{min,dur}$	[mm]	15	25	30	40														

		Exposure class																					
Criteria		XC1	XC2/XC3/XC4	XD1/XD2	XD3																		
<b><math>c_{min,dur}</math></b>	<b>[mm]</b>	<b>25</b>	<b>35</b>	<b>40</b>	<b>50</b>																		
<p>Design working life of 100 year or greater: <b><math>c_{min,dur} + 5 \text{ mm}</math></b>                      Prefabricated or Special quality is assured: <b><math>c_{min,dur} - 5 \text{ mm}</math></b></p> <p>When concrete class is same or greater than is in next table: <b><math>c_{min,dur} - 5 \text{ mm}</math></b></p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="4">Exposure class</th> </tr> <tr> <th>Criteria</th> <th>XC1</th> <th>XC2</th> <th>XC3/XD1/XD2</th> <th>XC4</th> <th>XD3</th> </tr> </thead> <tbody> <tr> <td>Concrete class</td> <td>C25/30</td> <td>C30/37</td> <td>C35/45</td> <td>C40/50</td> <td>C45/55</td> </tr> </tbody> </table> <p><b>minimal value of <math>c_{min,dur}</math> is 15 mm</b></p>								Exposure class				Criteria	XC1	XC2	XC3/XD1/XD2	XC4	XD3	Concrete class	C25/30	C30/37	C35/45	C40/50	C45/55
		Exposure class																					
Criteria	XC1	XC2	XC3/XD1/XD2	XC4	XD3																		
Concrete class	C25/30	C30/37	C35/45	C40/50	C45/55																		
4.4.1.2 (6)	Using the default EN																						
4.4.1.2 (7)	Using the default EN																						
4.4.1.2 (8)	Using the default EN																						
4.4.1.2 (13)	Using the default EN																						
4.4.1.3 (1)P	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the value of increasing of nominal concrete cover due deviation is given in the National Annex:</p> <p><b><math>\Delta c_{dev} = 5 \text{ mm}</math></b></p>																						
4.4.1.3 (3)	<p>When choosing the “<b>Austrian ÖNORM-EN method</b>” the values of accepted deviations for increasing of nominal concrete cover are given in the National Annex:</p> <p><b><math>\Delta c_{dev}</math> reduction is set to 0 mm</b></p>																						
4.4.1.3 (4)	Using the default EN																						
5.2 (5)	Using the default EN																						
5.5 (4)	Using the default EN																						
5.8.3.1 (1)	Using the default EN																						
5.10.2.1 (1)P	Using the default EN																						
5.10.2.1 (2)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the value of factor to calculate the maximum stress applied to the tendon during tensioning is given in the National Annex:</p>																						



	<b><math>k_3 = 0.92</math></b>
5.10.2.2 (5)	Using the default EN
5.10.3 (2)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the values of factors to calculate the maximum stress in prestressing reinforcement after anchoring are given in the National Annex:</p> <p><b><math>k_7 = 0.70</math></b> <b><math>k_8 = 0.80</math></b></p>
5.10.9 (1)P	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p> <p>The values for pre-tension <b><math>r_{sup} = r_{inf} = 1.0</math></b></p> <p>The values of factors to consider the possible upper and lower variation in the prestress in post-tension or bonded tendons are using the default EN</p>
NCI to 6.1(4)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the usage of minimal value of eccentricity is given in the National Annex:</p> <p><b><math>e = \max(e_0 + e_i + e_2; e_{min})</math></b></p> <p>where:  <math>e_0</math> ... 1<sup>st</sup> order eccentricity  <math>e_i</math> ... eccentricity from imperfections  <math>e_2</math> ... 2<sup>nd</sup> order eccentricity  <math>e_{min}</math> ... minimal value of eccentricity according clause 6.1(4)</p>
6.2.2 (1)	Using the default EN
6.2.2 (6)	Using the default EN
6.2.3 (2)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p><b><math>\theta_{min} = 30.96^\circ</math> (<math>\tan = 0.6</math>)</b></p> <p>The values of maximum angle are using the default EN</p>
6.2.3 (3)	Using the default EN
6.2.4 (4)	Using the default EN
6.2.4 (6)	Using the default EN

6.4.3 (6)	Using the default EN
6.4.4 (1)	Using the default EN
6.4.5 (3)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the expression for maximal punching shear resistance is given in the National Annex:</p> $V_{Rd,max} = \min(0.4 \cdot v \cdot f_{cd}; \kappa \cdot V_{Rd,c} \cdot u_1 / u_0)$ <p>where:  For <math>d \leq 200 \text{ mm}</math>: <math>\kappa = 1.40</math>  For <math>d \geq 700 \text{ mm}</math>: <math>\kappa = 1.65</math>  Intermediate values of <math>\kappa</math> are linearly interpolated according <math>d</math></p>
6.5.2 (2)	Using the default EN
6.5.4 (4)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the values of coefficients to calculate the design compressive strength are given in the National Annex:</p> $k_1 = 1.25$ $k_2 = 0.90$
7.2 (2)	Using the default EN
7.2 (3)	Using the default EN
7.2 (5)	Using the default EN
7.3.1 (5)	Using the default EN
7.3.4 (3)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the values of coefficients to calculate maximum final crack spacing are given in the National Annex:</p> $k_3 = 0$ $k_4 = 1 / (3.6 \cdot k_1 \cdot k_2) \leq (\rho_{p,eff} \cdot \sigma_s) / (3.6 \cdot k_1 \cdot k_2 \cdot f_{ct,eff})$
NCI to 7.3.4 (3)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the equation to calculation maximum crack spacing is given in the National Annex:</p> <p>After inputting <math>k_3=0</math> and <math>k_4</math> into equation 7.11, the equation is simplified to</p> $s_{r,max} = \phi / (3.6 \cdot \rho_{p,eff}) \leq (\sigma_s \cdot \phi) / (3.6 \cdot f_{ct,eff})$
8.2 (2)	When choosing the “ <b>Austrian ÖNORM-EN NA method</b> ” the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:

	<p><b><math>k_1 = 1.4</math></b>  <b><math>k_2 = 0 \text{ mm}</math></b> for one layer of reinforcement at checked edge  <b><math>k_2 = 10 \text{ mm}</math></b> for more layers of reinforcement at checked edge</p>
8.3 (2)	Using the default EN
9.2.1.1 (1)	Using the default EN
9.2.1.1 (3)	Using the default EN
9.2.1.2 (1)	Using the default EN
9.2.2 (5)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formula for calculation minimum ratio of shear reinforcement is given in the National Annex:</p> <p><b><math>\rho_{w,min} = 0.15 \cdot f_{ctm} / f_{yd}</math></b></p>
9.2.2 (6)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formula for calculation maximum spacing between shear assemblies is given in the National Annex:</p> <p><b><math>s_{l,max} = 0.75 \cdot d \cdot (1 + \cot \alpha) \leq 250 \text{ mm}</math></b></p>
9.2.2 (8)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formula for calculation maximum transverse spacing of the legs in series is given in the National Annex:</p> <p><b><math>s_{t,max} = 0.75 \cdot d \leq 800 \text{ mm}</math></b></p>
9.3.1.1(3)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>for principal reinforcement: <b><math>s_{max,slab} = 1.5 \cdot h \leq 250 \text{ mm}</math></b>  for secondary reinforcement: <b><math>s_{max,slab} = 3.0 \cdot h \leq 350 \text{ mm}</math></b></p>
9.5.2 (1)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p>for <math>h \geq 200 \text{ mm}</math>: <b><math>\phi_{min} = 12 \text{ mm}</math></b>  in other cases: <b><math>\phi_{min} = 10 \text{ mm}</math></b></p>
9.5.2 (2)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,min} = 0.13 \cdot N_{Ed} / f_{yd} \geq 0.0026 \cdot A_c</math></b></p>

9.5.2 (3)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formula for calculation maximum area of longitudinal reinforcement in column is given in the National Annex:</p> <p>for in-situ concrete members: <math>A_{s,max} = 0.08 \cdot A_c</math>  for prefabricated members: <math>A_{s,max} = 0.09 \cdot A_c</math></p>
NCI to 9.5.2 (4)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the value of minimal number of longitudinal bars in circular columns is given in the National Annex:</p> <p><math>n_{l,min} = 6</math></p>
9.5.3 (3)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><math>s_{cl,tmax} = \min(12 \cdot \phi_l; b_{min}; 250 \text{ mm})</math>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p>
9.6.2 (1)	Using the default EN
9.6.3 (1)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the formula for calculation minimum area of horizontal reinforcement in wall is given in the National Annex:</p> <p><math>A_{s,hmin} = 0.001 \cdot A_c</math></p>
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Belgium

According to Belgian National annex NBN EN 1992-1-1/NA: 2010-02

Article	Commentary
2.4.2.1 (1)	Using the default EN
2.4.2.2 (1)	Using the default EN
2.4.2.2 (2)	Using the default EN
2.4.2.4 (1)	Using the default EN
3.1.2 (2)P	Using the default EN

3.1.6 (1)P	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b></p>
3.1.6 (2)P	Using the default EN
3.2.2 (3)P	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 500 \text{ MPa}</math></b></p>
3.2.7 (2)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of characteristic strain limit is given in the National Annex:</p> <p><b><math>\epsilon_{uk} = 0.8</math></b></p>
3.3.4 (5)	Using the default EN
3.3.6 (7)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of characteristic strain limit for prestressed reinforcement is given in the National Annex:</p> <p><b><math>\epsilon_{ud} = 0.8 \cdot \epsilon_{uk}</math></b></p>
4.4.1.2 (3)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the values of minimum cover for pre-tensioned tendons are given in the National Annex:</p> <p>for strand or plain wire: <b>2 x diameter</b> for indented wire: <b>3 x diameter</b></p>
4.4.1.2 (5)	Using the default EN
4.4.1.2 (6)	Using the default EN
4.4.1.2 (7)	Using the default EN
4.4.1.2 (8)	Using the default EN
4.4.1.2 (13)	Using the default EN
4.4.1.3 (1)P	Using the default EN
4.4.1.3 (3)	Using the default EN
4.4.1.3 (4)	Using the default EN

5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of coefficient for increasing of limit stress in concrete for pretension members is given in the National Annex:</p> <p><b><math>k_6 = 0.667 \cdot f_{cm}(t) / f_{ck}(t)</math>, where <math>t = 28</math> days</b></p>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p> <p>The values for pre-tension and post-tension <b><math>r_{sup} = r_{inf} = 1.0</math></b></p>
6.2.2 (1)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the values for calculation of shear resistance of members not requiring design shear reinforcement are given in the National Annex:</p> <p>For members with plate geometry is default EN multiplied by factor 1.25:</p> <p><b><math>c_{Rd,c} = 1.25 \cdot 0.18 / \gamma_c</math></b>  <b><math>v_{min} = 1.25 \cdot 0.035 \cdot k^{3/2} \cdot f_{ck}^{1/2}</math></b>  <b><math>k_1 = 1.25 \cdot 0.15</math></b></p> <p>Other members using default EN</p>
6.2.2 (6)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of strength reduction factor for concrete cracked in shear is given in the National Annex:</p> <p><b><math>v = 0.6 \cdot (1 - f_{ck} / 250) / \alpha_{cc}</math> (<math>f_{ck}</math> in MPa)</b></p>
6.2.3 (2)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p><b><math>\theta_{min} = 18.43^\circ</math> (cotg = 3)</b></p> <p>The values of maximum angle is using the default EN</p>

6.2.3 (3)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</p> $v_1 = 0.6 / \alpha_{cc} \quad \text{for } f_{ck} \leq 60 \text{ MPa}$ $v_1 = \max(0.9 - (f_{ck} / \alpha_{cc}) / 200; 0.5 / \alpha_{cc}) \quad \text{for } f_{ck} > 60 \text{ MPa}$ <p>for non-prestressed members:  <math>\alpha_{cw} = 1.0</math></p> <p>for prestressed members:  <math>\alpha_{cw} = 1.0 + \sigma_{cp} / (f_{cd} / \alpha_{cc}) \quad \text{for } 0 &lt; \sigma_{cp} \leq 0.25 \cdot (f_{cd} / \alpha_{cc})</math>  <math>\alpha_{cw} = 1.25 \quad \text{for } 0.25 \cdot (f_{cd} / \alpha_{cc}) &lt; \sigma_{cp} \leq 0.5 \cdot (f_{cd} / \alpha_{cc})</math>  <math>\alpha_{cw} = 2.5 \cdot (1 - \sigma_{cp} / (f_{cd} / \alpha_{cc})) \quad \text{for } 0.5 \cdot (f_{cd} / \alpha_{cc}) &lt; \sigma_{cp} &lt; 1.0 \cdot (f_{cd} / \alpha_{cc})</math></p>
6.2.4 (4)	Using the default EN
6.2.4 (6)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of coefficient <math>k</math> is given in the National Annex:</p> $k = 0.5$
6.4.3 (6)	Using the default EN
6.4.4 (1)	Using the default EN
6.4.5 (3)	Using the default EN
6.5.2 (2)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of strength reduction factor for concrete cracked in shear is given in the National Annex:</p> $v = (1 - f_{ck} / 250) / \alpha_{cc} \quad (f_{ck} \text{ in MPa})$
6.5.4 (4)	Using the default EN
7.2 (2)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the coefficient for limit compressive stress is given in the National Annex:</p> $k_1 = 0.5 \quad \text{for environment classes XD, XF and XS}$ $k_1 = 0.6 \quad \text{for other environment classes}$
7.2 (3)	Using the default EN
7.2 (5)	Using the default EN
7.3.1 (5)	Using the default EN

7.3.4 (3)	Using the default EN
8.2 (2)	Using the default EN
8.3 (2)	Using the default EN
9.2.1.1 (1)	Using the default EN
9.2.1.1 (3)	Using the default EN
9.2.1.2 (1)	Using the default EN
9.2.2 (5)	Using the default EN where $f_{yk}$ is replaced by $f_{ywk}$
9.2.2 (6)	Using the default EN
9.2.2 (8)	Using the default EN
9.3.1.1(3)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>for principal reinforcement: <math>s_{max,slab} = 2.5 \cdot h \leq 400 \text{ mm}</math>  for secondary reinforcement: <math>s_{max,slab} = 3.0 \cdot h \leq 450 \text{ mm}</math></p> <p>Concentrated areas are not recognised</p>
9.5.2 (1)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><math>\phi_{min} = 12 \text{ mm}</math></p>
9.5.2 (2)	Using the default EN
9.5.2 (3)	Using the default EN
9.5.3 (3)	<p>When choosing the “<b>Belgian NBN-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 300 \text{ mm})</math>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p>
9.6.2 (1)	Using the default EN



9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>
12.6.3 (2)	<i>Using the default EN</i>

## United Kingdom

According to British National annex BS EN 1992-1-1/NA: 2005-12

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<p>When choosing the “<b>British BS-EN NA method</b>” the value partial factor for prestress action - favourable is given in the National Annex:</p> <p><b><math>\gamma_{P,fav} = 0.9</math></b></p>
2.4.2.2 (2)	<p>When choosing the “<b>British BS-EN NA method</b>” the value partial factor for prestress action - unfavourable is given in the National Annex:</p> <p><b><math>\gamma_{P,fav} = 1.1</math></b></p>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<p>When choosing the “<b>British BS-EN NA method</b>” the value of maximal concrete strength class is given in the National Annex:</p> <p>For shear strength: <b><math>C_{max} = C50/60</math></b>  For other cases: <b><math>C_{max} = C90/105</math></b></p>
3.1.6 (1)P	<p>When choosing the “<b>British BS-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b> for compression in flexure and axial loading  <b><math>\alpha_{cc} = 1.0</math></b> for other phenomena</p>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<i>Using the default EN</i>
3.2.7 (2)	<i>Using the default EN</i>

3.3.4 (5)	Using the default EN
3.3.6 (7)	Using the default EN
4.4.1.2 (3)	Using the default EN
4.4.1.2 (5)	<p>When choosing the “<b>British BS-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Using BS 8500-1:2006, tables A.4 and A.5</p>
4.4.1.2 (6)	Using the default EN
4.4.1.2 (7)	Using the default EN
4.4.1.2 (8)	Using the default EN
4.4.1.2 (13)	Using the default EN
4.4.1.3 (1)P	Using the default EN
4.4.1.3 (3)	Using the default EN
4.4.1.3 (4)	<p>When choosing the “<b>British BS-EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><b><math>k_1 = 40 \text{ mm}</math></b>  <b><math>k_2 = 65 \text{ mm}</math></b></p>
5.2 (5)	Using the default EN
5.5 (4)	<p>When choosing the “<b>British BS-EN NA method</b>” the values of coefficients to calculate the distributed moment when <math>f_{ck}</math> does not exceed 50 MPa are given in the National Annex:</p> <p>For reinforcement steel with <math>f_{yk} \leq 500 \text{ MPa}</math>:</p> <p><b><math>k_1 = k_3 = 0.4</math></b>  <b><math>k_2 = k_4 = 0.6 + 0.0014 / \epsilon_{cu2}</math></b>  <b><math>k_5 = 0.7</math></b>  <b><math>k_6 = 0.8</math></b></p> <p>For reinforcement steel with <math>f_{yk} &gt; 500 \text{ MPa}</math>:  This reinforcement is not allowed; therefore  <b><math>k_1 = k_2 = k_3 = k_4 = k_5 = k_6 = 0</math></b></p>
5.8.3.1 (1)	Using the default EN

5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<p>When choosing the <b>“British BS-EN NA method”</b> the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p> <p>The values for pre-tension and post-tension <math>r_{sup} = r_{inf} = 1.0</math></p>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<p>When choosing the <b>“British BS-EN NA method”</b> the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p>In standard concrete:  <math>\theta_{min} = 21.80^\circ</math> (<b>cotg = 2.5</b>)</p> <p>In elements in which shear co-exists with externally applied tension  <math>\theta_{min} = 45^\circ</math> (<b>cotg = 1.0</b>)</p> <p>The values of maximum angle are using the default EN</p>
6.2.3 (3)	<p>When choosing the <b>“British BS-EN NA method”</b> the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</p> <p><math>v_1 = v</math></p> <p>If <math>\sigma_{swd} &lt; 0.8 \cdot f_{ywk}</math>  <math>v_1 = 0.54 \cdot (1 - 0.5 \cdot \cos(\alpha_s))</math> for <math>f_{ck} \leq 60</math> MPa  <math>v_1 = \max((0.84 - (f_{ck} / 200)) \cdot (1 - 0.5 \cdot \cos(\alpha_s)); 0.5)</math> for <math>f_{ck} &gt; 60</math> MPa</p> <p>The coefficient taking account of the state of the stress in the compression chord <math>\alpha_{cw}</math> is using the default EN</p>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>

6.4.4 (1)	<i>Using the default EN</i>															
6.4.5 (3)	<i>Using the default EN</i>															
6.5.2 (2)	<i>Using the default EN</i>															
6.5.4 (4)	<i>Using the default EN</i>															
7.2 (2)	<i>Using the default EN</i>															
7.2 (3)	<i>Using the default EN</i>															
7.2 (5)	<i>Using the default EN</i>															
7.3.1 (5)	<p>When choosing the “<b>British BS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Quasi-permanent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD1, XD2, XS1, XS2, XS3</td> <td><b>0.3</b></td> <td><b>0.2 (decompression)</b></td> </tr> </tbody> </table>	Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Quasi-permanent load combination	Frequent load combination	X0, XC1	<b>0.3</b>	<b>0.2</b>	XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>	XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>
Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons														
	Quasi-permanent load combination	Frequent load combination														
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XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>														
XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>														
7.3.4 (3)	<i>Using the default EN</i>															
8.2 (2)	<i>Using the default EN</i>															
8.3 (2)	<i>Using the default EN</i>															
9.2.1.1 (1)	<i>Using the default EN</i>															
9.2.1.1 (3)	<i>Using the default EN</i>															
9.2.1.2 (1)	<p>When choosing the “<b>British BS-EN NA method</b>” the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:</p> <p><b><math>\beta_1 = 0.25</math></b></p>															
9.2.2 (5)	<i>Using the default EN</i>															
9.2.2 (6)	<i>Using the default EN</i>															

9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	When choosing the “ <b>British BS-EN NA method</b> ” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:  <b><math>\phi_{min} = 12 \text{ mm}</math></b>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<i>Using the default EN</i>
9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>
12.6.3 (2)	<i>Using the default EN</i>

## Cyprus

No National Annex currently available, using default EN.

## Czech Republic

According to Czech National annex ČSN EN 1992-1-1/NA: 2011-07

ČSN EN 1992-1-1/Opr.1.2009-07

ČSN EN 1992-1-1/Z1.2010-03

ČSN EN 1992-1-1/Opr.2.2011-06

ČSN EN 1992-1-1/Z2.2011-07

ČSN EN 1992-1-1/Z3.2016-05

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<i>Using the default EN</i>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>

3.1.2 (2)P	Using the default EN																																																																						
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4.4.1.2 (5)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Table 4.3CZ is used:</p> <table border="1"> <thead> <tr> <th rowspan="3">Criterion</th> <th colspan="8">Structural Class</th> </tr> <tr> <th colspan="8">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0</th> <th>XC1</th> <th>XC2</th> <th>XC3</th> <th>XC4</th> <th>XD1</th> <th>XD2</th> <th>XD3</th> </tr> </thead> <tbody> <tr> <td>Design Working Life of 80 years</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> </tr> <tr> <td>Design Working Life of 100 years</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> </tr> <tr> <td>Strength Class</td> <td>≥ C20/25 reduce class by 1</td> <td>≥ C25/30 reduce class by 1</td> <td>≥ C30/37 reduce class by 1</td> <td>≥ C35/45 reduce class by 1</td> <td>≥ C40/50 reduce class by 1</td> <td>≥ C40/50 reduce class by 1</td> <td>≥ C40/50 reduce class by 1</td> <td>≥ C45/55 reduce class by 1</td> </tr> <tr> <td>Members with slab geometry</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> </tr> <tr> <td>Special Quality Control</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> </tr> </tbody> </table> <p>Tables 4.4 and 4.5 are used from default EN</p>	Criterion	Structural Class								Exposure class according to Table 4.1								X0	XC1	XC2	XC3	XC4	XD1	XD2	XD3	Design Working Life of 80 years	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	Design Working Life of 100 years	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	Strength Class	≥ C20/25 reduce class by 1	≥ C25/30 reduce class by 1	≥ C30/37 reduce class by 1	≥ C35/45 reduce class by 1	≥ C40/50 reduce class by 1	≥ C40/50 reduce class by 1	≥ C40/50 reduce class by 1	≥ C45/55 reduce class by 1	Members with slab geometry	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	Special Quality Control	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1
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Design Working Life of 100 years	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2																																																															
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Members with slab geometry	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1																																																															
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4.4.1.2 (6)	Using the default EN																																																																						
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4.4.1.3 (1)P	Using the default EN																																																																						

4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the expression used in default EN remains unchanged, however the expression is limited:</p> <p><b><math>\lambda_{lim} \leq 75</math></b>  <b><math>\lambda_{lim} = 25</math> for <math> n  \geq 0.41</math></b>  <b><math>n = N_{Ed} / (A_c \cdot f_{cd})</math></b></p>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p><i>For bending + significant tension:</i>  <b><math>\theta_{min} = \theta_{max} = 45.0^\circ</math> (cotg = 1)</b></p> <p><i>For bending + significant compression (prestress):</i>  <b><math>\theta_{min} = 21.8^\circ</math> (cotg = 2.5)</b>  <b><math>\theta_{max} = 45^\circ</math> (cotg = 1.0)</b></p> <p><i>For bending without significant tension or compression:</i>  <b><math>\theta_{min} = 30.0^\circ</math> (cotg = 1.75)</b>  <b><math>\theta_{max} = 45^\circ</math> (cotg = 1.0)</b></p> <p>Significant tension or compression is when <b><math>N_{Ed} \geq Coeff_{com} \cdot A_c \cdot f_{cd}</math></b>  <b><math>Coeff_{com} = 0.1</math></b> by default, can be changed in Concrete setting</p>

6.2.3 (3)	Using the default EN
6.2.4 (4)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the values for calculation to prevent crushing of the compression struts in the flange are given in the National Annex:</p> <p><b><math>\theta_{min,c} = \theta_{max} = 40^\circ</math> (cotg = 1.2)</b>  <b><math>\theta_{min,t} = \theta_{max} = 45^\circ</math> (cotg = 1)</b></p>
6.2.4 (6)	Using the default EN
6.4.3 (6)	Using the default EN
6.4.4 (1)	Using the default EN
NCI to 6.4.5 (1)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the method for shear reinforcement on slabs with punching shear resistance is given in the National Annex:</p> <p>Formula (6.52) is limited to <b><math>k_{max} \cdot V_{Rd,c}</math></b>  For <math>h = 200 \text{ mm}</math> ... <b><math>k_{max} = 1.45</math></b>  For <math>h \geq 700 \text{ mm}</math> ... <b><math>k_{max} = 1.70</math></b>  intermediate values of <math>k_{max}</math> are linearly interpolated according <math>h</math>  For foundation slab ... <b><math>k_{max} = 1.50</math></b></p>
6.4.5 (3)	Using the default EN
6.5.2 (2)	Using the default EN
6.5.4 (4)	Using the default EN
7.2 (2)	Using the default EN
7.2 (3)	Using the default EN
7.2 (5)	Using the default EN
7.3.1 (5)	Using the default EN
NCI to 7.3.2(3)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the conditions for calculation <math>h_{c,ef}</math> are given in the National Annex:</p> <p>When <math>x_r</math> is greater or equal to <math>0.25 \cdot h</math> the depth of effective area of the concrete is calculated by followed formula.  <b><math>h_{c,ef} = \min(2.5 \cdot (h - d), (h - x_r) / 3, h/2)</math></b></p> <p>When <math>x_r</math> is lower than <math>0.25 \cdot h</math> the depth of effective area of the concrete is calculated by next formula.</p>



	$h_{c,ef} = \min(2.5 \cdot (h - d), h/2)$
7.3.4 (3)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the values of coefficients to calculate maximum final crack spacing are given in the National Annex:</p> <p><math>k_3 = 3.4 \cdot (25 / c)^{2/3} \leq 3.4 \dots</math> where <math>c</math> is concrete cover in mm  <math>k_4 = 0.425</math></p>
NCI to 7.3.4 (3)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the application of equation 7.14 is given in the National Annex:</p> <p>When spacing of reinforcement exceed <math>5 \cdot (c + \phi / 2)</math> the equation 7.14 is calculated as maximum from equation 7.14 and 7.11</p> <p><math>s_{r,max} = \max(1.3 \cdot (h - x); k_3 \cdot c + k_1 \cdot k_2 \cdot k_3 \cdot \phi / \rho_{p,eff})</math></p>
8.2 (2)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:</p> <p><math>k_1 = 1.2</math>  <math>k_2 = 5 \text{ mm}</math></p>
8.3 (2)	Using the default EN
9.2.1.1 (1)	Using the default EN
9.2.1.1 (3)	Using the default EN
9.2.1.2 (1)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:</p> <p><math>\beta_1 = 0.25</math></p>
9.2.2 (5)	Using the default EN
9.2.2 (6)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the expression used in default EN remains unchanged, however the expression is limited:</p> <p><math>s_{l,max} \leq 400 \text{ mm}</math></p>
9.2.2 (8)	Using the default EN
9.3.1.1(3)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>for principal reinforcement: <math>s_{max,slab} = 2.0 \cdot h \leq 300 \text{ mm}</math></p>

	<p>for secondary reinforcement: <math>s_{max,slab} = 3.0 \cdot h \leq 400 \text{ mm}</math></p> <p>Concentrated areas are not recognised</p>
9.5.2 (1)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p>For columns with dimension greater than 200 mm  <math>\phi_{min} = 12 \text{ mm}</math></p> <p>Other cases  <math>\phi_{min} = 10 \text{ mm}</math></p>
9.5.2 (2)	Using the default EN
9.5.2 (3)	Using the default EN
9.5.3 (3)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 300 \text{ mm})</math>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p>
9.6.2 (1)	Using the default EN
9.6.3 (1)	Using the default EN
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Denmark

No National Annex currently available, using default EN.

## Netherlands

According to Dutch National annex NEN EN 1992-1-1+C1:2011/NB:2011

Article	Commentary
2.4.2.1 (1)	Using the default EN

2.4.2.2 (1)	Using the default EN																							
2.4.2.2 (2)	When choosing the “ <b>Dutch NEN-EN NA method</b> ” the value of partial factors for unfavourable prestress is given in the National Annex: $\gamma_{P,unfav} = 1.2$																							
2.4.2.4 (1)	When choosing the “ <b>Dutch NEN-EN NA method</b> ” the values of partial factors for materials for ultimate limit states are given in the National Annex: <table border="1" data-bbox="496 506 1426 725"> <thead> <tr> <th>Design situations</th> <th><math>\gamma_c</math> for concrete</th> <th><math>\gamma_s</math> for reinforcing steel</th> <th><math>\gamma_s</math> for prestressing steel</th> </tr> </thead> <tbody> <tr> <td>Persistent &amp; Transient</td> <td>1.5</td> <td>1.15</td> <td>1.1</td> </tr> <tr> <td>Accidental</td> <td>1.2</td> <td>1.0</td> <td>1.0</td> </tr> </tbody> </table> <p>Partial factors for fatigue are not supported in Scia Engineer</p>	Design situations	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing steel	$\gamma_s$ for prestressing steel	Persistent & Transient	1.5	1.15	1.1	Accidental	1.2	1.0	1.0											
Design situations	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing steel	$\gamma_s$ for prestressing steel																					
Persistent & Transient	1.5	1.15	1.1																					
Accidental	1.2	1.0	1.0																					
3.1.2 (2)P	Using the default EN																							
3.1.6 (1)P	Using the default EN																							
3.1.6 (2)P	Using the default EN																							
3.2.2 (3)P	Using the default EN																							
3.2.7 (2)	Using the default EN																							
3.3.4 (5)	Using the default EN																							
3.3.6 (7)	When choosing the “ <b>Dutch NEN-EN NA method</b> ” the value of characteristic strain limit for prestressed reinforcement is given in the National Annex: $\epsilon_{ud} = 0.9 \cdot \epsilon_{uk}$																							
4.4.1.2 (3)	When choosing the “ <b>Dutch NEN-EN NA method</b> ” the values of minimum cover for pre-tensioned tendons are given in the National Annex:  for strand or plain wire: <b>1.5 x diameter</b> for indented wire: <b>2.5 x diameter</b>																							
4.4.1.2 (5)	When choosing the “ <b>Dutch NEN-EN NA method</b> ” the method for determination of the minimal concrete cover $c_{min,dur}$ is given in the National Annex:  Table 4.3N is used: <table border="1" data-bbox="496 1973 1426 2069"> <thead> <tr> <th rowspan="2">Criterion</th> <th colspan="7">Structural Class</th> </tr> <tr> <th colspan="7">Exposure class according to Table 4.1</th> </tr> </thead> <tbody> <tr> <td></td> <td>X0</td> <td>XC1</td> <td>XC2/XC3</td> <td>XC4</td> <td>XD1</td> <td>XD2/XS1</td> <td>XD3/XS2/XS3</td> </tr> </tbody> </table>	Criterion	Structural Class							Exposure class according to Table 4.1								X0	XC1	XC2/XC3	XC4	XD1	XD2/XS1	XD3/XS2/XS3
Criterion	Structural Class																							
	Exposure class according to Table 4.1																							
	X0	XC1	XC2/XC3	XC4	XD1	XD2/XS1	XD3/XS2/XS3																	

Design Working Life of 100 years	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2
Design Working Life of 75 years	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1
Strength Class	≥ C30/37 reduce class by 1	≥ C30/37 reduce class by 1	≥ C35/45 reduce class by 1	≥ C40/50 reduce class by 1	≥ C40/50 reduce class by 1	≥ C40/50 reduce class by 1	≥ C45/55 reduce class by 1
Members with slab geometry	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1
Special Quality Control	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1

Table 4.4N is used:

Environmental Requirement for $c_{min,dur}$ [mm]							
Structural Class	Exposure Class according to Table 4.1						
	X0	XC1	XC2/XC3	XC4	XD1/XS1	XD2/XS2	XD3/XS3
S1	10	10	10	15	20	25	25
S2	10	10	15	20	25	30	30
S3	10	10	20	25	30	35	35
S4	10	15	25	30	35	40	40
S5	15	20	30	35	40	45	45
S6	20	25	35	40	45	50	50

Table 4.5N is used:

Environmental Requirement for $c_{min,dur}$ [mm]							
Structural Class	Exposure Class according to Table 4.1						
	X0	XC1	XC2/XC3	XC4	XD1/XS1	XD2/XS2	XD3/XS3
S1	10	15	15	20	25	30	30
S2	10	15	20	25	30	35	35
S3	10	15	25	30	35	40	40
S4	10	20	30	35	40	45	45
S5	15	25	35	40	45	50	50
S6	20	30	40	45	50	55	55

4.4.1.2 (6)	Using the default EN
4.4.1.2 (7)	Using the default EN
4.4.1.2 (8)	Using the default EN
4.4.1.2 (13)	When choosing the “Dutch NEN-EN NA method” the values coefficients for increasing concrete cover for abrasion classes are given in the National Annex:  <b><math>k_1 = k_2 = k_3 = 0</math> mm</b>
4.4.1.3 (1)P	When choosing the “Dutch NEN-EN NA method” the value of increasing of nominal concrete cover due deviation is given in the National Annex:

	<b><math>\Delta c_{dev} + 5 \text{ mm}</math></b>
4.4.1.3 (3)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of accepted deviations for increasing of nominal concrete cover are given in the National Annex:</p> <p><b><math>0 \text{ mm} \leq \Delta c_{dev} \leq 5 \text{ mm}</math></b></p>
4.4.1.3 (4)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><b><math>k_1 = c_{min,dur} + 10 \text{ mm}</math></b>  <b><math>k_2 = c_{min,dur} + 50 \text{ mm}</math></b></p>
5.2 (5)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the value of basic imperfection represented by an inclination is given in the National Annex:</p> <p><b><math>\theta_0 = 1/300</math></b></p>
5.5 (4)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of coefficients to calculated the distributed moment are given in the National Annex:</p> <p><b><math>k_1 = f / (500 + f)</math></b>  <b><math>k_2 = 1.0</math></b>  <b><math>k_3 = 7 \cdot f / (\epsilon_{cu} \cdot 10^6 + 7 \cdot f)</math></b>  <b><math>k_4 = 1.0</math></b>  <b><math>k_5 = 0.7</math></b>  <b><math>k_6 = 0.8</math></b></p> <p><b><math>f = [(f_{pk} / \gamma_s - \sigma_{pm,\infty}) \cdot A_p + f_{yd} \cdot A_s] / (A_p + A_s)</math></b></p>
5.8.3.1 (1)	Using the default EN
5.10.2.1 (1)P	Using the default EN
5.10.2.1 (2)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the value of factor to calculate the maximum stress applied to the tendon during tensioning is given in the National Annex:</p> <p><b><math>k_3 = 0.90</math></b></p>
5.10.2.2 (5)	Using the default EN
5.10.3 (2)	Using the default EN
5.10.9 (1)P	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p>

	<p>The values for pre-tension and post-tension <math>r_{sup} = r_{inf} = 1.0</math></p>
NCI to 6.1 (2)P	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the maximal compressive stress in reinforcing steel is given in the National Annex:</p> <p><math>\sigma_{sc,min,lim} = 435 \text{ MPa}</math> (in compression)</p>
NCI to 6.1 (9)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the method for limitation of the height of compression zone given in the National Annex:</p> <p>Method is applicable when section is cracked in flexure (<math>\sigma_{ct,max} \geq f_{ctd}</math>) and section is loaded by normal force lower than</p> <p><math>N_{lim} = 0.1 \cdot f_{cd} \cdot A_c</math></p> <p>Limitation of the height of compression zone:</p> <p>For <math>f_{ck} &gt; 50 \text{ MPa}</math>: <math>x_u / d \leq \epsilon_{cu} \cdot 10^6 / (\epsilon_{cu} \cdot 10^6 + 7 \cdot f)</math></p> <p>For <math>f_{ck} \leq 50 \text{ MPa}</math>: <math>x_u / d \leq 500 / (500 + f)</math></p> <p>where:</p> <p><math>x_u</math> ... limit height of compression zone</p> <p><math>d</math> ... effective height of the cross-section</p> <p><math>f = f_{yd}</math> because prestressed reinforcement is not implemented in Scia Engineer.</p> <p>If reinforcement bars with different materials are used in the section, <math>f =</math> weighted arithmetic mean of <math>f_{yd}</math> from all bars by the area of bars</p>
6.2.2 (1)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values for calculation of shear resistance of members not requiring design shear reinforcement are given in the National Annex:</p> <p>For persistent or transient load:</p> <p><math>C_{Rdc} = 0.12</math></p> <p>For accidental load:</p> <p><math>C_{Rdc} = 0.15</math></p> <p><math>k_1</math> and <math>v_{min}</math> are used the default EN</p>
6.2.2 (6)	Using the default EN
6.2.3 (2)	Using the default EN
6.2.3 (3)	Using the default EN
6.2.4 (4)	Using the default EN
6.2.4 (6)	Using the default EN

6.4.3 (6)	Using the default EN																	
6.4.4 (1)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the expressions used in default EN remains unchanged, except the value of <math>k_1</math></p> <p>In case of compression</p> <p><b><math>k_1 = 0.1</math></b></p> <p>In case of tension</p> <p><b><math>k_1 = 0.5</math></b></p>																	
6.4.5 (3)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the expression for maximal punching shear resistance is given in the National Annex:</p> <p><b><math>V_{Rd,max} = 0.4 \cdot v \cdot f_{cd}</math></b></p>																	
6.5.2 (2)	Using the default EN																	
6.5.4 (4)	Using the default EN																	
7.2 (2)	Using the default EN																	
7.2 (3)	Using the default EN																	
7.2 (5)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the factors for maximum stress in reinforcement or prestressing steel are given in the National Annex:</p> <p><b><math>k_3 = k_4 = k_5 = 0</math></b></p>																	
7.3.1 (5)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <table border="1" data-bbox="496 1442 1426 1778"> <thead> <tr> <th>Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Frequent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.4</b></td> <td><b>0.3</b></td> </tr> <tr> <td>XC2, XC3, XC4</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD1, XD2, XS1, XS2, XS3</td> <td><b>0.2</b></td> <td><b>0.1</b></td> </tr> </tbody> </table> <p>The value from table 7.1N is multiplied by factor <math>k_x</math></p> <p><b><math>k_x = 1 \leq c / c_{nom} \leq 2</math></b></p> <p><math>c</math> is concrete cover which is used in construction  <math>c_{nom}</math> is nominal cover calculated by chapter 4.4.1.1(2)P</p>			Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Frequent load combination	Frequent load combination	X0, XC1	<b>0.4</b>	<b>0.3</b>	XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>	XD1, XD2, XS1, XS2, XS3	<b>0.2</b>	<b>0.1</b>
Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons																
	Frequent load combination	Frequent load combination																
X0, XC1	<b>0.4</b>	<b>0.3</b>																
XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>																
XD1, XD2, XS1, XS2, XS3	<b>0.2</b>	<b>0.1</b>																

7.3.4 (3)	Using the default EN						
8.2 (2)	Using the default EN						
8.3 (2)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of minimum mandrel diameter of bars and wires for bends, hooks and loops are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Bar diameter</th> <th>Minimum mandrel</th> </tr> </thead> <tbody> <tr> <td><math>\phi \leq 16 \text{ mm}</math></td> <td><math>4\phi</math></td> </tr> <tr> <td><math>\phi &gt; 16 \text{ mm}</math></td> <td><math>5\phi</math></td> </tr> </tbody> </table>	Bar diameter	Minimum mandrel	$\phi \leq 16 \text{ mm}$	$4\phi$	$\phi > 16 \text{ mm}$	$5\phi$
Bar diameter	Minimum mandrel						
$\phi \leq 16 \text{ mm}$	$4\phi$						
$\phi > 16 \text{ mm}$	$5\phi$						
9.2.1.1 (1)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the minimum reinforcement area of longitudinal reinforcement in beams is given in the National Annex:</p> <p><math>A_{s,min} = \min(A_{s,min1}; A_{s,min2})</math></p> <p><math>A_{s,min1}</math> is calculated according chapter 6.1 on combinations of moment <math>M_{E,min}</math> and normal force <math>N_{E,min}</math></p> <p><math>A_{s,min2}</math> is 1.25 times the area required to test in the ultimate limit state</p> <p>where:</p> <p><math>M_{E,min} = f_{ctm} \cdot W \cdot \eta / (\eta - 1) \dots</math> when <math>N_{E,min}</math> is compression</p> <p><math>M_{E,min} = f_{ctm} \cdot W \cdot \eta / (\eta + 1) \dots</math> when <math>N_{E,min}</math> is tension</p> <p><math>M_{E,min} = f_{ctm} \cdot W \dots</math> pure bending</p> <p><math>N_{E,min} = f_{ctm} \cdot A_c \cdot 1 / (1 - \eta) \dots</math> when <math>N_{E,min}</math> is compression</p> <p><math>N_{E,min} = f_{ctm} \cdot A_c \cdot 1 / (1 + \eta) \dots</math> when <math>N_{E,min}</math> is tension</p> <p>where:</p> <p><math>W \dots</math> Elastic section modulus to the most tensile fibre</p> <p><math>\eta = e \cdot A_c / W</math></p> <p>where:</p> <p><math>e \dots</math> 1<sup>st</sup> order eccentricity from the considered load combination</p>						
9.2.1.1 (3)	Using the default EN						
9.2.1.2 (1)	Using the default EN						
9.2.2 (5)	Using the default EN						
9.2.2 (6)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the expression used in default EN remains unchanged, however the expression is limited:</p> <p><math>s_{l,max} \leq 300 \text{ mm}</math></p>						



9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<i>Using the default EN</i>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the formula for calculation minimum and maximum area of vertical reinforcement in wall is given in the National Annex:</p> <p><math>A_{s,vmin} = 0 \text{ mm}^2</math> (minimal area is not limited)  <math>A_{s,vmax} = 0.04 \cdot A_c</math></p>
9.6.3 (1)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the formula for calculation minimum area of horizontal reinforcement in wall is given in the National Annex:</p> <p><math>A_{s,hmin} = 0 \text{ mm}^2</math> (minimal area is not limited)</p>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>
12.6.3 (2)	<i>Using the default EN</i>

## Finland

According to Finnish National annex SFS EN 1992-1-1/NA

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the value partial factor for prestress action - favourable is given in the National Annex:</p> <p><math>\gamma_{P,fav} = 0.9</math></p>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>

3.1.2 (2)P	Using the default EN																																																														
3.1.6 (1)P	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b></p>																																																														
3.1.6 (2)P	Using the default EN																																																														
3.2.2 (3)P	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 700 \text{ MPa}</math></b></p>																																																														
3.2.7 (2)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the value of characteristic strain limit is given in the National Annex:</p> <p><b><math>\epsilon_{ud} = 1 \%</math></b></p>																																																														
3.3.4 (5)	Using the default EN																																																														
3.3.6 (7)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the value of characteristic strain limit for prestressed reinforcement is given in the National Annex:</p> <p><b><math>\epsilon_{ud} = 2 \%</math></b></p>																																																														
4.4.1.2 (3)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of minimum cover for pre-tensioned tendons are given in the National Annex:</p> <p>for strand or plain wire: <b>2 x diameter</b></p> <p>for indented wire: <b>2 x diameter</b></p>																																																														
4.4.1.2 (5)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Table 4.3N (FI) is used:</p> <table border="1"> <thead> <tr> <th colspan="9">Requirement for value of minimum cover <math>c_{min,dur}</math> according to exposure classes [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="8">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0</th> <th>XC1</th> <th>XC2 XC3</th> <th>XC4</th> <th>XD1</th> <th>XS1</th> <th>XD2</th> <th>XD3 XS2,3</th> </tr> </thead> <tbody> <tr> <td>Reinforcing steel</td> <td>10</td> <td>10</td> <td>20</td> <td>25</td> <td>30</td> <td>30</td> <td>35</td> <td>40</td> </tr> <tr> <td>Prestressing steel</td> <td>10</td> <td>20</td> <td>30</td> <td>35</td> <td>40</td> <td>40</td> <td>45</td> <td>50</td> </tr> <tr> <td>Design working life 100 years</td> <td>+0</td> <td>+0</td> <td>+5</td> <td>+5</td> <td>+5</td> <td>+5</td> <td>+5</td> <td>+5</td> </tr> <tr> <td>Concrete strength <math>\geq</math></td> <td>C20/25 -5</td> <td>C30/37 -5</td> <td>C35/45 -5</td> <td>C35/45 -5</td> <td>C35/45 -5</td> <td>C40/50 -5</td> <td>C35/45 -5</td> <td>C45/55 -5</td> </tr> </tbody> </table>	Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]									Criterion	Exposure class according to Table 4.1								X0	XC1	XC2 XC3	XC4	XD1	XS1	XD2	XD3 XS2,3	Reinforcing steel	10	10	20	25	30	30	35	40	Prestressing steel	10	20	30	35	40	40	45	50	Design working life 100 years	+0	+0	+5	+5	+5	+5	+5	+5	Concrete strength $\geq$	C20/25 -5	C30/37 -5	C35/45 -5	C35/45 -5	C35/45 -5	C40/50 -5	C35/45 -5	C45/55 -5
Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]																																																															
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Design working life 100 years	+0	+0	+5	+5	+5	+5	+5	+5																																																							
Concrete strength $\geq$	C20/25 -5	C30/37 -5	C35/45 -5	C35/45 -5	C35/45 -5	C40/50 -5	C35/45 -5	C45/55 -5																																																							

	<table border="1"> <tr> <td>Construction class 1 (RakMK B4)</td> <td>-5</td> <td>-5</td> <td>-5</td> <td>-5</td> <td>-5</td> <td>-5</td> <td>-5</td> <td>-5</td> </tr> </table>	Construction class 1 (RakMK B4)	-5	-5	-5	-5	-5	-5	-5	-5
Construction class 1 (RakMK B4)	-5	-5	-5	-5	-5	-5	-5	-5		
4.4.1.2 (6)	Using the default EN									
4.4.1.2 (7)	Using the default EN									
4.4.1.2 (8)	Using the default EN									
4.4.1.2 (13)	Using the default EN									
4.4.1.3 (1)P	Using the default EN									
4.4.1.3 (3)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of accepted deviations for increasing of nominal concrete cover are given in the National Annex:</p> <p><b><math>5 \text{ mm} \leq \Delta c_{dev} \leq 10 \text{ mm}</math></b></p>									
4.4.1.3 (4)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><b><math>k_1 = c_{min,dur} + 10 \text{ mm}</math></b>  <b><math>k_2 = c_{min,dur} + 30 \text{ mm}</math></b></p> <p>For uneven surface  <b><math>c_{min,dur} + 5 \text{ mm}</math></b></p>									
5.2 (5)	Using the default EN									
5.5 (4)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of coefficients to calculated the distributed moment are given in the National Annex:</p> <p><b><math>k_1 = 0.44</math></b>  <b><math>k_2 = 1.10</math></b>  <b><math>k_3 = 0.54</math></b>  <b><math>k_4 = 1.25 \cdot (0.6 + 0.0014 / \varepsilon_{cu,2})</math></b></p> <p><b><math>k_5 = k_6 = 1</math> when <math>100 \cdot \varepsilon_{uk} \cdot f_t / f_{yk} &lt; 2.5</math></b>  <b><math>k_5 = k_6 = 0.9 - 3.21 \cdot \varepsilon_{uk} \cdot f_t / f_{yk}</math> when <math>100 \cdot \varepsilon_{uk} \cdot f_t / f_{yk} \geq 2.5</math></b></p>									
5.8.3.1 (1)	Using the default EN									
5.10.2.1 (1)P	Using the default EN									

5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<p>When choosing the <b>“Finnish SFS-EN NA method”</b> the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p> <p>The values for pre-tension and post-tension <math>r_{sup} = r_{inf} = 1.0</math></p>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<i>Using the default EN</i>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>
6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>
6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<i>Using the default EN</i>
7.2 (3)	<i>Using the default EN</i>
7.2 (5)	<p>When choosing the <b>“Finnish SFS-EN NA method”</b> the factors for maximum stress in reinforcement or prestressing steel are given in the National Annex:</p> <p><math>k_3 = 0.6</math>  <math>k_4 = 0.8</math>  <math>k_5 = 0.6</math></p>
7.3.1 (5)	When choosing the <b>“Finnish SFS-EN NA method”</b> the values of maximal calculated crack width are given in the National Annex:

	<table border="1"> <tr> <td><i>Exposure class</i></td> <td>Reinforced members and prestressed members with unbonded tendons</td> <td>Prestressed members with bonded tendons</td> </tr> <tr> <td></td> <td>Frequent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.4</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XS1</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD2, XD3, XS2, XS3</td> <td><b>0.2</b></td> <td><b>Decompression</b></td> </tr> </table>	<i>Exposure class</i>	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Frequent load combination	Frequent load combination	X0, XC1	<b>0.4</b>	<b>0.2</b>	XC2, XC3, XC4, XD1, XS1	<b>0.3</b>	<b>0.2</b>	XD2, XD3, XS2, XS3	<b>0.2</b>	<b>Decompression</b>
<i>Exposure class</i>	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons														
	Frequent load combination	Frequent load combination														
X0, XC1	<b>0.4</b>	<b>0.2</b>														
XC2, XC3, XC4, XD1, XS1	<b>0.3</b>	<b>0.2</b>														
XD2, XD3, XS2, XS3	<b>0.2</b>	<b>Decompression</b>														
7.3.4 (3)	Using the default EN															
8.2 (2)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:</p> <p><b><math>k_1 = 1</math></b> <b><math>k_2 = 3 \text{ mm}</math></b></p>															
8.3 (2)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of minimum mandrel diameter of bars and wires for bends, hooks and loops are given in the National Annex:</p> <table border="1"> <thead> <tr> <th><i>Bar diameter</i></th> <th><i>Minimum mandrel</i></th> </tr> </thead> <tbody> <tr> <td><b><math>\phi \leq 16 \text{ mm}</math></b></td> <td><b><math>4\phi</math></b></td> </tr> <tr> <td><b><math>\phi &gt; 16 \text{ mm}</math></b></td> <td><b><math>7\phi</math></b></td> </tr> </tbody> </table>	<i>Bar diameter</i>	<i>Minimum mandrel</i>	<b><math>\phi \leq 16 \text{ mm}</math></b>	<b><math>4\phi</math></b>	<b><math>\phi &gt; 16 \text{ mm}</math></b>	<b><math>7\phi</math></b>									
<i>Bar diameter</i>	<i>Minimum mandrel</i>															
<b><math>\phi \leq 16 \text{ mm}</math></b>	<b><math>4\phi</math></b>															
<b><math>\phi &gt; 16 \text{ mm}</math></b>	<b><math>7\phi</math></b>															
9.2.1.1 (1)	Using the default EN															
9.2.1.1 (3)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the value of maximum area of longitudinal reinforcement is given in the National Annex:</p> <p><b><math>A_{s,max}</math> is unlimited</b></p>															
9.2.1.2 (1)	Using the default EN															
9.2.2 (5)	Using the default EN															
9.2.2 (6)	Using the default EN															
9.2.2 (8)	Using the default EN															
9.3.1.1(3)	When choosing the “ <b>Finnish SFS-EN NA method</b> ” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:															

	<p>for principal reinforcement is formula same as in default EN for secondary reinforcement: <math>s_{max,slab} = 4.0 \cdot h \leq 600 \text{ mm}</math></p> <p>Concentrated areas are same as in default EN</p>
9.5.2 (1)	Using the default EN
9.5.2 (2)	Using the default EN
9.5.2 (3)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the formula for calculation maximum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><math>A_{s,max} = 0.06 \cdot A_c</math></p> <p>Laps are not recognised in Scia Engineer</p>
9.5.3 (3)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 400 \text{ mm})</math> where: <math>\phi_l</math> is minimum diameter of the longitudinal bars <math>b_{min}</math> is the lesser dimension of the column</p>
9.6.2 (1)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the formula for calculation minimum and maximum area of vertical reinforcement in wall is given in the National Annex:</p> <p><math>A_{s,vmin} = 0.002 \cdot A_c</math> <math>A_{s,vmax} = 0.06 \cdot A_c</math></p>
9.6.3 (1)	Using the default EN
9.7 (1)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the formula for calculation minimum are of reinforcement in deep beams in each face and each direction is given in the National Annex:</p> <p><math>A_{s,dbmin} = 0.0005 \cdot A_c \geq 150 \text{ mm}^2/\text{m}</math></p>
12.3.1 (1)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the coefficients taking account of long term effects on the compressive and tensile strength and of unfavourable effects resulting from the way the load is applied for plain concrete are given in the National Annex:</p> <p><math>\alpha_{cc,pl} = 0.80</math> <math>\alpha_{ct,pl} = 0.60</math></p>

12.6.3 (2)	<i>Using the default EN</i>
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## France

According to French National annex NF EN 1992-1-1/NA:2007-03

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<i>Using the default EN</i>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<i>Using the default EN</i>
3.1.6 (1)P	<i>Using the default EN</i>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<p>When choosing the <b>“French NF-EN NA method”</b> the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 500 \text{ MPa}</math></b></p>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<i>Using the default EN</i>
4.4.1.2 (5)	<i>Using the default EN</i>
4.4.1.2 (6)	<i>Using the default EN</i>
4.4.1.2 (7)	<i>Using the default EN</i>
4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>

4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<p>When choosing the <b>“French NF-EN NA method”</b> the values of factors to calculate the maximum stress in prestressing reinforcement after anchoring are given in the National Annex:</p> <p>For post-tension:  <math>k_7 = 0.77</math> and <math>k_8 = 0.87</math></p> <p>For pre-tension:  <math>k_7 = 0.80</math> and <math>k_8 = 0.90</math></p>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<p>When choosing the <b>“French NF-EN NA method”</b> the values for calculation of shear resistance of members not requiring design shear reinforcement are given in the National Annex:</p> <p>For slabs with transverse redistribution effect for the considered loading case:  <math>v_{min} = 0.34 / \gamma_c \cdot f_{ck}^{1/2}</math></p> <p>For beams and slabs other than before:  <math>v_{min} = 0.053 / \gamma_c \cdot k^{3/2} \cdot f_{ck}^{1/2}</math></p> <p>For walls:  <math>v_{min} = 0.35 / \gamma_c \cdot f_{ck}^{1/2}</math></p> <p><math>c_{Rd,c}</math> and <math>k_1</math> are same as in default EN</p>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<p>When choosing the <b>“French NF-EN NA method”</b> the value of minimum and maximum angle between the concrete compression strut and the beam axis perpendicular to the shear force are given in the National Annex:</p>



	<p><i>In compression or in simple bending:</i>  <math>\theta_{min} = 21.80^\circ</math> (<math>\cotg = 2.5</math>)  <math>\theta_{max} = 45^\circ</math> (<math>\cotg = 1</math>)</p> <p><i>In tension:</i>  <math>\theta_{min} = \arccotg(2.5 \cdot (1 + \sigma_{ct} / f_{ctm})^{1/2})</math>  <math>\theta_{max} = \arccotg((1 + \sigma_{ct} / f_{ctm})^{1/2})</math></p>
6.2.3 (3)	<p>When choosing the “<b>French NF-EN NA method</b>” the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</p> <p><math>v_1</math> is calculated according default EN</p> <p>members without tension force:  <math>\alpha_{cw} = 1.0</math></p> <p>members with composed bending with tension:  <math>\alpha_{cw} = \alpha_{cw,t} = 1 + \sigma_{cp} / f_{ctm}</math></p> <p><math>\sigma_{cp}</math> is cross-section axial stress at the centre of gravity, where positive is compressive and negative is tensile stress. Therefore, <math>\alpha_{cw}</math> is less than 1 for axial tension stress.</p>
6.2.4 (4)	Using the default EN
6.2.4 (6)	<p>When choosing the “<b>French NF-EN NA method</b>” the value of coefficient <math>k</math> is given in the National Annex:</p> <p>for vertical joints: <math>k = 0.5</math>  for horizontal joints: <math>k = 1.0</math></p>
6.4.3 (6)	Using the default EN
6.4.4 (1)	Using the default EN
6.4.5 (3)	Using the default EN
6.5.2 (2)	Using the default EN
6.5.4 (4)	Using the default EN
7.2 (2)	Using the default EN
7.2 (3)	Using the default EN
7.2 (5)	When choosing the “ <b>French NF-EN NA method</b> ” the factors for maximum stress in reinforcement or prestressing steel are given in the National Annex:

	<p><math>k_3 = 0.8</math>  <math>k_4 = 1.0</math>  <math>k_5 = 0.8</math></p>															
7.3.1 (5)	<p>When choosing the “<b>French NF-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Frequent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.4</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD1, XD2, XS1, XS2, XS3, XD3</td> <td><b>0.2</b></td> <td><b>decompression</b></td> </tr> </tbody> </table>	Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Frequent load combination	Frequent load combination	X0, XC1	<b>0.4</b>	<b>0.2</b>	XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>	XD1, XD2, XS1, XS2, XS3, XD3	<b>0.2</b>	<b>decompression</b>
Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons														
	Frequent load combination	Frequent load combination														
X0, XC1	<b>0.4</b>	<b>0.2</b>														
XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>														
XD1, XD2, XS1, XS2, XS3, XD3	<b>0.2</b>	<b>decompression</b>														
NCI to 7.3.2(3)	<p>When choosing the “<b>French NF-EN NA method</b>” the conditions for calculation <math>h_{c,ef}</math> are given in the National Annex:</p> <p><math>h_{c,ef} = \min(2.5 \cdot (h - d), h/2)</math></p>															
7.3.4 (3)	<p>When choosing the “<b>French NF-EN NA method</b>” the values of coefficients to calculate maximum final crack spacing are given in the National Annex:</p> <p><math>c \leq 25 \text{ mm}: k_3 = 3.4</math>  <math>c &gt; 25 \text{ mm}: k_3 = 3.4 \cdot (25 / c)^{2/3}</math></p> <p>where <math>c</math> is concrete cover in mm</p> <p><math>k_4</math> is same as in default EN</p>															
8.2 (2)	<p>Using the default EN</p> <p>Deep foundations are not recognised in Scia Engineer</p>															
8.3 (2)	<p>Using the default EN</p>															
9.2.1.1 (1)	<p>Using the default EN</p> <p>Condition for post-tension members is not implemented</p>															
9.2.1.1 (3)	<p>Using the default EN</p>															
9.2.1.2 (1)	<p>Using the default EN</p>															

9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<p>When choosing the “<b>French NF-EN NA method</b>” the formula for calculation maximum spacing between shear assemblies is given in the National Annex:</p> <p><math>h &gt; 250 \text{ mm: } s_{l,max} = 0.75 \cdot d \cdot (1 + \cot \alpha)</math></p> <p><math>h \leq 250 \text{ mm: } s_{l,max} = 0.90 \cdot d</math></p>
9.2.2 (8)	<p>When choosing the “<b>French NF-EN NA method</b>” the formula for calculation maximum transverse spacing of the legs in series is given in the National Annex:</p> <p><math>h &gt; 250 \text{ mm: } s_{t,max} = 0.75 \cdot d \leq 600 \text{ mm}</math></p> <p><math>h \leq 250 \text{ mm: } s_{t,max} = 0.9 \cdot d</math></p>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<i>Using the default EN</i>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<p><i>Using the default EN</i></p> <p><i>Special case for plain and lightly reinforced walls is not implemented.</i></p>
9.6.3 (1)	<p><i>Using the default EN</i></p> <p><i>Special case for plain and lightly reinforced walls is not implemented.</i></p>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<p><i>Using the default EN</i></p> <p><i>Special cases for tunnels are not implemented in Scia Engineer</i></p>
12.6.3 (2)	<i>Using the default EN</i>

## Germany

According to German National annex DIN EN 1992-1-1/NA:2011-01

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>

2.4.2.2 (1)	Using the default EN									
2.4.2.2 (2)	Using the default EN									
2.4.2.4 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of partial factors for materials for ultimate limit states are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Design situations</th> <th><math>\gamma_c</math> for concrete</th> <th><math>\gamma_s</math> for reinforcing and prestressing steel</th> </tr> </thead> <tbody> <tr> <td>Persistent &amp; Transient</td> <td><b>1.5</b></td> <td><b>1.15</b></td> </tr> <tr> <td>Accidental</td> <td><b>1.3</b></td> <td><b>1.0</b></td> </tr> </tbody> </table> <p>Partial factors for fatigue are not supported in Scia Engineer</p>	Design situations	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing and prestressing steel	Persistent & Transient	<b>1.5</b>	<b>1.15</b>	Accidental	<b>1.3</b>	<b>1.0</b>
Design situations	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing and prestressing steel								
Persistent & Transient	<b>1.5</b>	<b>1.15</b>								
Accidental	<b>1.3</b>	<b>1.0</b>								
3.1.2 (2)P	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of maximal concrete strength class is given in the National Annex:</p> <p><b><math>C_{max} = C100/115</math></b></p>									
3.1.6 (1)P	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b></p>									
3.1.6 (2)P	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of coefficient taking account of long term effects on the tensile strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{ct} = 0.85</math></b></p> <p>Condition according clause 8.4.2(2) is not implemented</p>									
3.2.2 (3)P	<p>When choosing the “<b>German DIN-EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 500 \text{ MPa}</math></b></p>									
3.2.7 (2)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of characteristic strain limit is given in the National Annex:</p> <p><b><math>\epsilon_{ud} = 2.5 \%</math></b></p>									
3.3.4 (5)	Using the default EN									

3.3.6 (7)	<p>Using the default EN</p> <p>Special diagram is not implemented</p>																																																																																													
4.4.1.2 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of minimum cover for pre-tensioned tendons are given in the National Annex:</p> <p>for strand or plain wire: <b>2.5 x diameter</b></p>																																																																																													
4.4.1.2 (5)	<p>When choosing the “<b>German DIN-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Tables 4.3DE, 4.4DE and 4.5DE are used as modification to default EN tables</p> <p>Table 4.3N is modified by 4.3DE:</p> <table border="1" data-bbox="497 824 1423 990"> <thead> <tr> <th colspan="8">Requirement for value of minimum cover <math>c_{min,dur}</math> according to exposure classes [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="7">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0 XC1</th> <th>XC2</th> <th>XC3</th> <th>XC4</th> <th>XD1 XS1</th> <th>XD2 XS2</th> <th>XD3 XS3</th> </tr> </thead> <tbody> <tr> <td>Concrete strength <math>\geq</math></td> <td>0</td> <td>C25/30 -5</td> <td>C30/37 -5</td> <td>C35/45 -5</td> <td>C40/50 -5</td> <td>C45/55 -5</td> <td>C45/55 -5</td> </tr> </tbody> </table> <p>Table 4.4N is modified by 4.4DE – basic structural class S3</p> <table border="1" data-bbox="497 1075 1423 1249"> <thead> <tr> <th colspan="8">Requirement for value of minimum cover <math>c_{min,dur}</math> according to exposure classes [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="7">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0</th> <th>XC1</th> <th>XC2 XC3</th> <th>XC4</th> <th>XD1 XS1</th> <th>XD2 XS2</th> <th>XD3 XS3</th> </tr> </thead> <tbody> <tr> <td>S3 -&gt; Standard construction for 50 years</td> <td>10</td> <td>20</td> <td>20</td> <td>25</td> <td>30</td> <td>35</td> <td>40</td> </tr> </tbody> </table> <p>Table 4.5N is modified by 4.5DE – basic structural class S3</p> <table border="1" data-bbox="497 1294 1423 1509"> <thead> <tr> <th colspan="8">Requirement for value of minimum cover <math>c_{min,dur}</math> according to exposure classes [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="7">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0</th> <th>XC1</th> <th>XC2 XC3</th> <th>XC4</th> <th>XD1 XS1</th> <th>XD2 XS2</th> <th>XD3 XS3</th> </tr> </thead> <tbody> <tr> <td>S3 -&gt; Standard construction for 50 years</td> <td>10</td> <td>20</td> <td>30</td> <td>35</td> <td>40</td> <td>45</td> <td>50</td> </tr> </tbody> </table>	Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]								Criterion	Exposure class according to Table 4.1							X0 XC1	XC2	XC3	XC4	XD1 XS1	XD2 XS2	XD3 XS3	Concrete strength $\geq$	0	C25/30 -5	C30/37 -5	C35/45 -5	C40/50 -5	C45/55 -5	C45/55 -5	Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]								Criterion	Exposure class according to Table 4.1							X0	XC1	XC2 XC3	XC4	XD1 XS1	XD2 XS2	XD3 XS3	S3 -> Standard construction for 50 years	10	20	20	25	30	35	40	Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]								Criterion	Exposure class according to Table 4.1							X0	XC1	XC2 XC3	XC4	XD1 XS1	XD2 XS2	XD3 XS3	S3 -> Standard construction for 50 years	10	20	30	35	40	45	50
Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]																																																																																														
Criterion	Exposure class according to Table 4.1																																																																																													
	X0 XC1	XC2	XC3	XC4	XD1 XS1	XD2 XS2	XD3 XS3																																																																																							
Concrete strength $\geq$	0	C25/30 -5	C30/37 -5	C35/45 -5	C40/50 -5	C45/55 -5	C45/55 -5																																																																																							
Requirement for value of minimum cover $c_{min,dur}$ according to exposure classes [mm]																																																																																														
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S3 -> Standard construction for 50 years	10	20	20	25	30	35	40																																																																																							
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S3 -> Standard construction for 50 years	10	20	30	35	40	45	50																																																																																							
4.4.1.2 (6)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of concrete cover increasing by additive safety element <math>\Delta c_{dur,y}</math> is given in the National Annex:</p> <p>Additive safety element according table 4.4DE is used:</p> <p>for XD1 or XS1: <math>\Delta c_{dur,y} = +10 \text{ mm}</math></p> <p>for XD2 or XS2: <math>\Delta c_{dur,y} = +5 \text{ mm}</math></p>																																																																																													
4.4.1.2 (7)	Using the default EN																																																																																													

4.4.1.2 (8)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of concrete cover reduction by additional protection (coating) <math>\Delta c_{dur,add}</math> is given in the National Annex:</p> <p>Cover reduction according table 4.5DE is used:  for X0, XC, XS: <math>\Delta c_{dur,add} = 0 \text{ mm}</math>  for XD: <math>\Delta c_{dur,add} = 10 \text{ mm}</math></p>
4.4.1.2 (13)	Using the default EN
4.4.1.3 (1)P	Using the default EN
4.4.1.3 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values for decreasing the deviations for increasing of nominal concrete cover are given in the National Annex:</p> <p>If the extra quality management during planning, fabrication and construction is assured:  <math>\Delta c_{dev} = 5 \text{ mm}</math></p>
4.4.1.3 (4)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><math>k_1 = 20 \text{ mm}</math>  <math>k_2 = 50 \text{ mm}</math></p>
5.2 (5)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of basic imperfection represented by an inclination is given in the National Annex:</p> <p><math>\theta_0 = \min(1 / (100 \cdot \sqrt{l}) \cdot 1 / \alpha_h; 1 / 200 \cdot 1 / \alpha_h)</math></p>
5.5 (4)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of coefficients to calculated the distributed moment are given in the National Annex:</p> <p><math>k_1 = 0.64</math>  <math>k_2 = 0.8</math>  <math>k_3 = 0.72</math>  <math>k_4 = 0.8</math>  <math>k_5 = 0.7</math> for <math>f_{ck} \leq 50 \text{ MPa}</math> and <math>k_5 = 0.8</math> for <math>f_{ck} &gt; 50 \text{ MPa}</math>  <math>k_6 = 0.85</math> for <math>f_{ck} \leq 50 \text{ MPa}</math> and <math>k_6 = 1.0</math> for <math>f_{ck} &gt; 50 \text{ MPa}</math></p>
5.8.3.1 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the slenderness criterion where second order effects may be ignored is given in the National Annex:</p> <p><math>\lambda_{lim} = 25</math> for <math> n  \geq 0.41</math>  <math>\lambda_{lim} = 16 / \sqrt{ n }</math> for <math> n  &lt; 0.41</math></p> <p>where: <math>n = N_{Ed} / (A_c \cdot f_{cd})</math></p>

5.10.2.1 (1)P	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of factor to calculate the force to the tendon during tensioning is given in the National Annex:</p> $k_1 = 0.8 \cdot k_\mu$ $k_2 = 0.9 \cdot k_\mu$ <p>where: <math>k_\mu = e^{\mu \cdot \gamma(\kappa-1)}</math></p>
5.10.2.1 (2)	<p>Using the default EN</p> <p>Value for concrete bridges is not implemented</p>
5.10.2.2 (5)	Using the default EN
5.10.3 (2)	Using the default EN
5.10.9 (1)P	Using the default EN
6.2.2 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values for calculation of shear resistance of members not requiring design shear reinforcement are given in the National Annex:</p> $c_{Rd,c} = 0.15 / \gamma_c$ $k_1 = 0.12$ <p>For <math>d \leq 600</math> mm: <math>v_{min} = (0.0525 / \gamma_c) \cdot k^{3/2} \cdot f_{ck}^{1/2}</math>  For <math>d &gt; 800</math> mm: <math>v_{min} = (0.0375 / \gamma_c) \cdot k^{3/2} \cdot f_{ck}^{1/2}</math>  For intermediate values of <math>d</math> is used linear interpolation.</p>
6.2.2 (6)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value for strength reduction factor for concrete cracked in shear is given in the National Annex:</p> <p>For shear force: <math>v = 0.675</math>  For torsion force: <math>v = 0.525</math>  Shear check in joint:</p> <ul style="list-style-type: none"> <li>- very smooth joint: <math>v = 0</math></li> <li>- smooth joint: <math>v = 0.20</math></li> <li>- rough joint: <math>v = 0.50</math></li> <li>- toothed joint: <math>v = 0.70</math></li> </ul>
6.2.3 (2)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of minimum angle and maximum between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members are given in the National Annex:</p>

	<p><math>\theta_{min} = 18.43^\circ</math> (cotg = 3.0)</p> <p>For pure bending and bending with pressure: <math>\theta_{max} = 39.80^\circ</math> (cotg = 1.2) For bending with tension: <math>\theta_{max} = 45.0^\circ</math> (cotg = 1.0)</p> <p>Equations (NA.6.7a) and (NA.6.7b) are not implemented</p>
6.2.3 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</p> <p>For <math>\leq C50/60</math>: <math>v_1 = 0.75</math> For <math>\geq C55/67</math>: <math>v_1 = 0.75 \cdot (1.1 - f_{ck} / 500)</math></p> <p><math>\alpha_{cw} = 1.0</math></p>
6.2.4 (4)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values for calculation to prevent crushing of the compression struts in the flange are given in the National Annex:</p> <p><math>\theta_{min,c} = 39.84^\circ</math> (cotg = 1.2) <math>\theta_{min,t} = 45.0^\circ</math> (cotg = 1) <math>\theta_{max} = 59.89^\circ</math> (cotg = 0.58)</p> <p>Calculation according 6.2.3 (2) is not implemented. Simplification values are implemented.</p>
6.2.4 (6)	Using the default EN
6.4.3 (6)	Using the default EN
6.4.4 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values for calculation punching shear resistance of slabs and column bases without shear resistance are given in the National Annex:</p> <p>For <math>u_0 / d \geq 4</math>: <math>C_{Rdc} = 0.18 / \gamma_c</math> For internal columns and <math>u_0 / d &lt; 4</math>: <math>C_{Rdc} = 0.18 / \gamma_c \cdot (0.1 \cdot u_0 / d + 0.6)</math> For single fundaments where <math>a \leq 3</math>: <math>C_{Rdc} = 0.12 / \gamma_c \cdot \lambda^{0.4}</math> <math>\lambda = a_\lambda / d</math> <math>k_1 = 0.1</math> <math>v_{min}</math> is according 6.2.2(1)</p>
6.4.5 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the limitation for maximum shear resistance is given in the National Annex:</p> <p><math>v_{Rd,max} = 11 \cdot (d / u_0)^{1/2} \cdot v_{Rd,c}</math></p>
6.5.2 (2)	When choosing the “ <b>German DIN-EN NA method</b> ” the value of strength reduction factor for concrete cracked in shear is given in the National Annex:



	$v' = 1$																
6.5.4 (4)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of coefficients to calculate the design compressive strength are given in the National Annex:</p> <p><math>k_1 = 1.1</math> <math>k_2 = 0.75</math></p>																
7.2 (2)	Using the default EN																
7.2 (3)	Using the default EN																
7.2 (5)	<p>When choosing the “<b>German DIN-EN NA method</b>” the factors for maximum stress in reinforcement or prestressing steel are given in the National Annex:</p> <p><math>k_3 = 0.8</math> <math>k_4 = 1.0</math> <math>k_5 = 0.65</math></p>																
7.3.1 (5)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Post-tensioned members</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Quasi-permanent load combination</td> <td>Frequent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.4</b></td> <td><b>0.2</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XD2, XD3, XS1, XS2, XS3</td> <td><b>0.3</b></td> <td><b>0.2</b></td> <td><b>Decompression</b></td> </tr> </tbody> </table>	Exposure class	Reinforced members and prestressed members with unbonded tendons	Post-tensioned members	Prestressed members with bonded tendons		Quasi-permanent load combination	Frequent load combination	Frequent load combination	X0, XC1	<b>0.4</b>	<b>0.2</b>	<b>0.2</b>	XC2, XC3, XC4, XD1, XD2, XD3, XS1, XS2, XS3	<b>0.3</b>	<b>0.2</b>	<b>Decompression</b>
Exposure class	Reinforced members and prestressed members with unbonded tendons	Post-tensioned members	Prestressed members with bonded tendons														
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X0, XC1	<b>0.4</b>	<b>0.2</b>	<b>0.2</b>														
XC2, XC3, XC4, XD1, XD2, XD3, XS1, XS2, XS3	<b>0.3</b>	<b>0.2</b>	<b>Decompression</b>														
NCI to 7.3.2(3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the conditions for calculation <math>h_{c,ef}</math> are given in the National Annex:</p> <p>When <math>(h - x_r) / 3</math> is greater or equal to concrete cover + 20 mm the depth of effective area of the concrete is calculated by followed formula.  <math>h_{c,ef} = \min(\text{Coeff}_{hc,ef} \cdot (h - d), (h - x_r) / 3, h/2)</math></p> <p>When <math>(h - x_r) / 3</math> is lower than concrete cover + 20 mm the depth of effective area of the concrete is calculated by next formula.  <math>h_{c,ef} = \min(\text{Coeff}_{hc,ef} \cdot (h - d), h/2)</math></p> <p><math>\text{Coeff}_{hc,ef}</math> depends on ratio <math>h / (h - d)</math>  <math>h / (h - d) \leq 5 : \text{Coeff}_{hc,ef} = 2.5</math></p>																

	<p><math>h / (h - d) &gt; 5</math> and <math>\leq 30</math> : <math>\text{Coeff}_{hc,ef} = \text{linear interpolation between 2.5 and 5}</math>  <math>h / (h - d) &gt; 30</math> : <math>\text{Coeff}_{hc,ef} = 5.0</math></p>						
7.3.4 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of coefficients to calculate maximum final crack spacing are given in the National Annex:</p> <p><math>k_1 \cdot k_2 = 1</math>  <math>k_3 = 0</math>  <math>k_4 = 1 / 3.6</math></p>						
NCI to 7.3.4 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the equation to calculation maximum crack spacing is given in the National Annex:</p> <p>Equations (7.11) and (7.14) are limited to  <math>s_{r,max} \leq (\sigma_s \cdot \phi) / (3.6 \cdot f_{ct,eff})</math></p>						
8.2 (2)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:</p> <p><math>k_1 = 1.0</math>  For <math>d_g \leq 16</math> mm: <math>k_2 = 0</math> mm  For <math>d_g &gt; 16</math> mm: <math>k_2 = 5</math> mm</p>						
8.3 (2)	<p>When choosing the “<b>German DIN-EN NA method</b>” the values of minimum mandrel diameter of bars and wires for bends, hooks and loops are given in the National Annex:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Bar diameter</th> <th style="text-align: center;">Minimum mandrel</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><math>\phi &lt; 20</math> mm</td> <td style="text-align: center;"><math>4\phi</math></td> </tr> <tr> <td style="text-align: center;"><math>\phi \geq 20</math> mm</td> <td style="text-align: center;"><math>7\phi</math></td> </tr> </tbody> </table> <p>Other values from table NA.8.1 are not implemented</p>	Bar diameter	Minimum mandrel	$\phi < 20$ mm	$4\phi$	$\phi \geq 20$ mm	$7\phi$
Bar diameter	Minimum mandrel						
$\phi < 20$ mm	$4\phi$						
$\phi \geq 20$ mm	$7\phi$						
9.2.1.1 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the minimum reinforcement area of longitudinal reinforcement in beams is given in the National Annex:</p> <p><math>A_{s,min} = 0 \cdot b_t \cdot d = 0</math> mm<sup>2</sup>  (<math>A_{s,min}</math> is unlimited)</p>						
9.2.1.1 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of maximum area of longitudinal reinforcement is given in the National Annex:</p> <p><math>A_{s,max} = 0.08 \cdot A_c</math></p>						
9.2.1.2 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:</p>						

	<b><math>\beta_1 = 0.25</math></b>																	
9.2.2 (5)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formula for calculation minimum ratio of shear reinforcement is given in the National Annex:</p> <p>For pretension members: <math>\rho_{w,min} = 0.256 \cdot f_{ctm} / f_{yd}</math></p> <p>For other members: <math>\rho_{w,min} = 0.16 \cdot f_{ctm} / f_{yd}</math></p>																	
9.2.2 (6)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of maximum spacing between shear assemblies is given in the National Annex:</p> <table border="1"> <thead> <tr> <th rowspan="2">Shear force utilization</th> <th colspan="2">Concrete strength class</th> </tr> <tr> <th><math>\leq C50/60</math></th> <th><math>&gt; C50/60</math></th> </tr> </thead> <tbody> <tr> <td><math>V_{Ed} \leq 0.3 \cdot V_{Rd,max}</math></td> <td><b>0.7h or 300 mm</b> (note)</td> <td><b>0.7h or 200 mm</b></td> </tr> <tr> <td><math>0.3 \cdot V_{Rd,max} &lt; V_{Ed} \leq 0.6 \cdot V_{Rd,max}</math></td> <td><b>0.5h or 300 mm</b></td> <td><b>0.5h or 200 mm</b></td> </tr> <tr> <td><math>V_{Ed} &gt; 0.6 \cdot V_{Rd,max}</math></td> <td colspan="2"><b>0.25h or 200 mm</b></td> </tr> <tr> <td colspan="3">Note: when <math>h &lt; 200</math> mm and <math>V_{Ed} \leq V_{Rd,c}</math>: <b><math>s_{l,max} = 150</math> mm</b></td> </tr> </tbody> </table>	Shear force utilization	Concrete strength class		$\leq C50/60$	$> C50/60$	$V_{Ed} \leq 0.3 \cdot V_{Rd,max}$	<b>0.7h or 300 mm</b> (note)	<b>0.7h or 200 mm</b>	$0.3 \cdot V_{Rd,max} < V_{Ed} \leq 0.6 \cdot V_{Rd,max}$	<b>0.5h or 300 mm</b>	<b>0.5h or 200 mm</b>	$V_{Ed} > 0.6 \cdot V_{Rd,max}$	<b>0.25h or 200 mm</b>		Note: when $h < 200$ mm and $V_{Ed} \leq V_{Rd,c}$ : <b><math>s_{l,max} = 150</math> mm</b>		
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Note: when $h < 200$ mm and $V_{Ed} \leq V_{Rd,c}$ : <b><math>s_{l,max} = 150</math> mm</b>																		
9.2.2 (8)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of maximum transverse spacing of the legs in series is given in the National Annex:</p> <table border="1"> <thead> <tr> <th rowspan="2">Shear force utilization</th> <th colspan="2">Concrete strength class</th> </tr> <tr> <th><math>\leq C50/60</math></th> <th><math>&gt; C50/60</math></th> </tr> </thead> <tbody> <tr> <td><math>V_{Ed} \leq 0.3 \cdot V_{Rd,max}</math></td> <td><b>h or 800 mm</b></td> <td><b>h or 600 mm</b></td> </tr> <tr> <td><math>0.3 \cdot V_{Rd,max} &lt; V_{Ed} \leq V_{Rd,max}</math></td> <td><b>h or 600 mm</b></td> <td><b>h or 400 mm</b></td> </tr> </tbody> </table>	Shear force utilization	Concrete strength class		$\leq C50/60$	$> C50/60$	$V_{Ed} \leq 0.3 \cdot V_{Rd,max}$	<b>h or 800 mm</b>	<b>h or 600 mm</b>	$0.3 \cdot V_{Rd,max} < V_{Ed} \leq V_{Rd,max}$	<b>h or 600 mm</b>	<b>h or 400 mm</b>						
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$0.3 \cdot V_{Rd,max} < V_{Ed} \leq V_{Rd,max}$	<b>h or 600 mm</b>	<b>h or 400 mm</b>																
9.3.1.1(3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>For principal reinforcement:</p> <p>For <math>h \geq 250</math> mm: <b><math>s_{max,slab} = 250</math> mm</b></p> <p>For <math>h &lt; 150</math> mm: <b><math>s_{max,slab} = 150</math> mm</b></p> <p>Intermediate values are linearly interpolated</p> <p>For secondary reinforcement: <b><math>s_{max,slab} = 250</math> mm</b></p>																	
9.5.2 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12</math> mm</b></p>																	
9.5.2 (2)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p>																	

	$A_{s,min} = \max(0.15 \cdot  N_{Ed}  / f_{yd} ; 0.0 \cdot A_c)$
9.5.2 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formula for calculation maximum area of longitudinal reinforcement in column is given in the National Annex:</p> $A_{s,max} = 0.09 \cdot A_c$
9.5.3 (3)	<p>When choosing the “<b>German DIN-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> $s_{cl,tmax} = \min(12 \cdot \phi_l ; b_{min} ; 300 \text{ mm})$ <p>where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p>
9.6.2 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formula for calculation minimum and maximum area of vertical reinforcement in wall is given in the National Annex:</p> <p>Generally: <math>A_{s,vmin} = 0.15 \cdot  N_{Ed}  / f_{yd} \geq 0.0015 \cdot A_c</math>  For thin walls with <math>\lambda \geq \lambda_{lim}</math> or with <math> N_{Ed}  \geq 0.3 \cdot f_{cd} \cdot A_c</math>: <math>A_{s,vmin} = 0.003 \cdot A_c</math>  <math>A_{s,vmax} = 0.04 \cdot A_c</math></p>
9.6.3 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formula for calculation minimum area of horizontal reinforcement in wall is given in the National Annex:</p> <p>Generally: <math>A_{s,hmin} = 0.2 \cdot A_{s,v}</math>  For thin walls with <math>\lambda \geq \lambda_{lim}</math> or with <math> N_{Ed}  \geq 0.3 \cdot f_{cd} \cdot A_c</math>: <math>A_{s,hmin} = 0.5 \cdot A_{s,v}</math></p>
9.7 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the formula for calculation minimum are of reinforcement in deep beams in each face and each direction is given in the National Annex:</p> $A_{s,dbmin} = 0.00075 \cdot A_c \geq 150 \text{ mm}^2/m$
12.3.1 (1)	<p>When choosing the “<b>German DIN-EN NA method</b>” the coefficients taking account of long term effects on the compressive and tensile strength and of unfavourable effects resulting from the way the load is applied for plain concrete are given in the National Annex:</p> $\alpha_{cc,pl} = 0.70$ $\alpha_{ct,pl} = 0.70$
12.6.3 (2)	<p>When choosing the “<b>German DIN-EN NA method</b>” the coefficient for calculation of shear stress in plain concrete is given in the National Annex:</p>

	$k = S \cdot A_{cc} / (b_w \cdot l)$
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## Greece

According to Greek National annex draft ELOT EN 1492-1-1:2009

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<i>Using the default EN</i>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the value of maximal concrete strength class is given in the National Annex:</p> <p><b>C<sub>max</sub> = C50/60</b></p>
3.1.6 (1)P	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the value of coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b>α<sub>cc</sub> = 0.85</b></p>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b>f<sub>yk</sub> = 500 MPa</b></p>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<i>Using the default EN</i>
4.4.1.2 (5)	<i>Using the default EN</i>
4.4.1.2 (6)	<i>Using the default EN</i>
4.4.1.2 (7)	<i>Using the default EN</i>

4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>
4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<i>Using the default EN</i>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>
6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>

6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<i>Using the default EN</i>
7.2 (3)	<i>Using the default EN</i>
7.2 (5)	<i>Using the default EN</i>
7.3.1 (5)	<i>Using the default EN</i>
7.3.4 (3)	<i>Using the default EN</i>
8.2 (2)	<i>Using the default EN</i>
8.3 (2)	<i>Using the default EN</i>
9.2.1.1 (1)	<i>Using the default EN</i>
9.2.1.1 (3)	<i>Using the default EN</i>
9.2.1.2 (1)	<i>Using the default EN</i>
9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<i>Using the default EN</i>
9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<i>Using the default EN</i>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<i>Using the default EN</i>
9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>

12.6.3 (2)	<i>Using the default EN</i>

## Ireland

According to Irish National annex I.S. EN 1992-1-1/NA:2010-01

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the value partial factor for prestress action - favourable is given in the National Annex:</p> <p><b><math>\gamma_{P,fav} = 0.9</math></b></p>
2.4.2.2 (2)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the value partial factor for prestress action - unfavourable is given in the National Annex:</p> <p><b><math>\gamma_{P,fav} = 1.1</math></b></p>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<i>Using the default EN</i>
3.1.6 (1)P	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b> for compression in flexure and axial loading  <b><math>\alpha_{cc} = 1.0</math></b> for other phenomena</p>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 500 \text{ MPa}</math></b></p>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<i>Using the default EN</i>



4.4.1.2 (5)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Tables NA.6 and NA.7 are used</p> <table border="1" data-bbox="496 309 1426 562"> <thead> <tr> <th colspan="12">Nominal cover <math>c_{min,dur}</math> [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="11">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0</th> <th>XC1</th> <th>XC2</th> <th>XC3</th> <th>XC4</th> <th>XS1</th> <th>XS2</th> <th>XS3</th> <th>XD1</th> <th>XD2</th> <th>XD3</th> </tr> </thead> <tbody> <tr> <td>Design life 50 years</td> <td>10</td> <td>15</td> <td>25</td> <td>25</td> <td>30</td> <td>35</td> <td>40</td> <td>45</td> <td>35</td> <td>40</td> <td>45</td> </tr> <tr> <td>Design Life 100 years</td> <td>10</td> <td>25</td> <td>35</td> <td>35</td> <td>40</td> <td>45</td> <td>50</td> <td>55</td> <td>45</td> <td>50</td> <td>50</td> </tr> </tbody> </table>	Nominal cover $c_{min,dur}$ [mm]												Criterion	Exposure class according to Table 4.1											X0	XC1	XC2	XC3	XC4	XS1	XS2	XS3	XD1	XD2	XD3	Design life 50 years	10	15	25	25	30	35	40	45	35	40	45	Design Life 100 years	10	25	35	35	40	45	50	55	45	50	50
Nominal cover $c_{min,dur}$ [mm]																																																												
Criterion	Exposure class according to Table 4.1																																																											
	X0	XC1	XC2	XC3	XC4	XS1	XS2	XS3	XD1	XD2	XD3																																																	
Design life 50 years	10	15	25	25	30	35	40	45	35	40	45																																																	
Design Life 100 years	10	25	35	35	40	45	50	55	45	50	50																																																	
4.4.1.2 (6)	Using the default EN																																																											
4.4.1.2 (7)	Using the default EN																																																											
4.4.1.2 (8)	Using the default EN																																																											
4.4.1.2 (13)	Using the default EN																																																											
4.4.1.3 (1)P	Using the default EN																																																											
4.4.1.3 (3)	Using the default EN																																																											
4.4.1.3 (4)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><b><math>k_1 = 50 \text{ mm}</math></b>  <b><math>k_2 = 75 \text{ mm}</math></b></p>																																																											
5.2 (5)	Using the default EN																																																											
5.5 (4)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the values of coefficients to calculated the distributed moment when <math>f_{ck}</math> does not exceed 50 MPa are given in the National Annex:</p> <p>For reinforcement steel with <math>f_{yk} \leq 500 \text{ MPa}</math>:</p> <p><b><math>k_1 = k_3 = 0.4</math></b>  <b><math>k_2 = 0.6 + 0.0014 / \varepsilon_{cu2}</math></b>  <b><math>k_5 = 0.7</math></b>  <b><math>k_6 = 0.8</math></b></p> <p>For reinforcement steel with <math>f_{yk} &gt; 500 \text{ MPa}</math>:  This reinforcement is not allowed; therefore  <b><math>k_1 = k_2 = k_3 = k_4 = k_5 = k_6 = 0</math></b></p>																																																											

5.8.3.1 (1)	Using the default EN
5.10.2.1 (1)P	Using the default EN
5.10.2.1 (2)	Using the default EN
5.10.2.2 (5)	Using the default EN
5.10.3 (2)	Using the default EN
5.10.9 (1)P	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p> <p>The values for pre-tension and post-tension <math>r_{sup} = r_{inf} = 1.0</math></p>
6.2.2 (1)	Using the default EN
6.2.2 (6)	Using the default EN
6.2.3 (2)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p>In standard concrete:  <math>\theta_{min} = 21.80^\circ</math> (cotg = 2.5)  In elements in which shear co-exists with externally applied tension  <math>\theta_{min} = 38.67^\circ</math> (cotg = 1.25)</p> <p>In standard concrete:  <math>\theta_{max} = 45.0^\circ</math> (cotg = 1)  In elements in which shear co-exists with externally applied tension  <math>\theta_{max} = 38.67^\circ</math> (cotg = 1.25)</p>
6.2.3 (3)	<p>When choosing the “<b>Irish I.S. EN NA method</b>” the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</p> <p><math>v_1 = v</math></p> <p>If <math>\sigma_{swd} &lt; 0.8 \cdot f_{ywk}</math>  <math>v_1 = 0.54 \cdot (1 - 0.5 \cdot \cos(\alpha_s))</math> for <math>f_{ck} \leq 60</math> MPa  <math>v_1 = \max((0.84 - (f_{ck} / 200)) \cdot (1 - 0.5 \cdot \cos(\alpha_s)); 0.5)</math> for <math>f_{ck} &gt; 60</math> MPa</p> <p>The coefficient taking account of the state of the stress in the compression chord <math>\alpha_{cw}</math> is using the default EN</p>
6.2.4 (4)	Using the default EN

6.2.4 (6)	<i>Using the default EN</i>															
6.4.3 (6)	<i>Using the default EN</i>															
6.4.4 (1)	<i>Using the default EN</i>															
6.4.5 (3)	<i>Using the default EN</i>															
6.5.2 (2)	<i>Using the default EN</i>															
6.5.4 (4)	<i>Using the default EN</i>															
7.2 (2)	<i>Using the default EN</i>															
7.2 (3)	<i>Using the default EN</i>															
7.2 (5)	<i>Using the default EN</i>															
7.3.1 (5)	<p>When choosing the <b>“Irish I.S. EN NA method”</b> the values of maximal calculated crack width are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Quasi-permanent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD1, XD2, XS1, XS2, XS3</td> <td><b>0.3</b></td> <td><b>0.2 (decompression)</b></td> </tr> </tbody> </table>	Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Quasi-permanent load combination	Frequent load combination	X0, XC1	<b>0.3</b>	<b>0.2</b>	XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>	XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>
Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons														
	Quasi-permanent load combination	Frequent load combination														
X0, XC1	<b>0.3</b>	<b>0.2</b>														
XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>														
XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>														
7.3.4 (3)	<i>Using the default EN</i>															
8.2 (2)	<i>Using the default EN</i>															
8.3 (2)	<i>Using the default EN</i>															
9.2.1.1 (1)	<i>Using the default EN</i>															
9.2.1.1 (3)	<i>Using the default EN</i>															
9.2.1.2 (1)	<p>When choosing the <b>“Irish I.S. EN NA method”</b> the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:</p> <p><b><math>\beta_1 = 0.25</math></b></p>															

9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<i>Using the default EN</i>
9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<p>When choosing the <b>“Irish I.S. EN NA method”</b> the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12 \text{ mm}</math></b></p>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<i>Using the default EN</i>
9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<p>When choosing the <b>“Irish I.S. EN NA method”</b> the formula for calculation minimum area of reinforcement in deep beams in each face and each direction is given in the National Annex:</p> <p><b><math>A_{s,dbmin} = 0.002 \cdot A_c</math></b></p>
12.3.1 (1)	<p>When choosing the <b>“Irish I.S. EN NA method”</b> the coefficients taking account of long term effects on the compressive and tensile strength and of unfavourable effects resulting from the way the load is applied for plain concrete are given in the National Annex:</p> <p><b><math>\alpha_{cc,pl} = 0.60</math></b>  <b><math>\alpha_{ct,pl} = 0.80</math></b></p>
12.6.3 (2)	<i>Using the default EN</i>

## Italy

No National Annex currently available, using default EN.

## Luxembourg

According to Luxembourgian National annex EN 1992-1-1:2004/AN-LU:2011-09

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<i>Using the default EN</i>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<i>Using the default EN</i>
3.1.6 (1)P	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><math>\alpha_{cc} = 0.85</math> for compression in flexure and axial loading  <math>\alpha_{cc} = 1.0</math> for other phenomena</p>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<i>Using the default EN</i>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the values of minimum cover for pre-tensioned tendons are given in the National Annex:</p> <p>for strand or plain wire: <b>2 x diameter</b>  for indented wire: <b>3 x diameter</b></p>
4.4.1.2 (5)	<i>Using the default EN</i>
4.4.1.2 (6)	<i>Using the default EN</i>
4.4.1.2 (7)	<i>Using the default EN</i>
4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>

4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<i>Using the default EN</i>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>
6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>
6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<i>Using the default EN</i>
7.2 (3)	<i>Using the default EN</i>

7.2 (5)	<i>Using the default EN</i>
7.3.1 (5)	<i>Using the default EN</i>
7.3.4 (3)	<i>Using the default EN</i>
8.2 (2)	<i>Using the default EN</i>
8.3 (2)	<i>Using the default EN</i>
9.2.1.1 (1)	<i>Using the default EN</i>
9.2.1.1 (3)	<i>Using the default EN</i>
9.2.1.2 (1)	<i>Using the default EN</i>
9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<i>Using the default EN</i>
9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>for principal reinforcement: <math>s_{max,slab} = 2.5 \cdot h \leq 400 \text{ mm}</math>  for secondary reinforcement: <math>s_{max,slab} = 3.0 \cdot h \leq 450 \text{ mm}</math></p> <p>Concentrated areas are not recognised</p>
9.5.2 (1)	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p>For prefabricated columns: <math>\phi_{min} = 8 \text{ mm}</math>  For cast in place columns: <math>\phi_{min} = 12 \text{ mm}</math></p>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 300 \text{ mm})</math>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>

	$b_{min}$ is the lesser dimension of the column
9.6.2 (1)	Using the default EN
9.6.3 (1)	Using the default EN
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Malaysia

According to Malaysian National annex MS EN 1992-1-1:2010

Article	Commentary
2.4.2.1 (1)	Using the default EN
2.4.2.2 (1)	When choosing the “ <b>Malaysian MS-EN NA method</b> ” the value partial factor for prestress action - favourable is given in the National Annex:  $\gamma_{P,fav} = 0.9$
2.4.2.2 (2)	When choosing the “ <b>Malaysian MS-EN NA method</b> ” the value partial factor for prestress action - unfavourable is given in the National Annex:  $\gamma_{P,fav} = 1.1$
2.4.2.4 (1)	Using the default EN
3.1.2 (2)P	When choosing the “ <b>Malaysian MS-EN NA method</b> ” the value of maximal concrete strength class is given in the National Annex:  For shear strength: $C_{max} = C50/60$ For other cases: $C_{max} = C90/105$
3.1.6 (1)P	When choosing the “ <b>Malaysian MS-EN NA method</b> ” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:  $\alpha_{cc} = 0.85$ for compression in flexure and axial loading $\alpha_{cc} = 1.0$ for other phenomena
3.1.6 (2)P	Using the default EN



3.2.2 (3)P	Using the default EN
3.2.7 (2)	Using the default EN
3.3.4 (5)	Using the default EN
3.3.6 (7)	Using the default EN
4.4.1.2 (3)	Using the default EN
4.4.1.2 (5)	<p>When choosing the “<b>Malaysian MS-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Use BS 8500-1:2006, tables A.4 and A.5</p>
4.4.1.2 (6)	Using the default EN
4.4.1.2 (7)	Using the default EN
4.4.1.2 (8)	Using the default EN
4.4.1.2 (13)	Using the default EN
4.4.1.3 (1)P	Using the default EN
4.4.1.3 (3)	Using the default EN
4.4.1.3 (4)	<p>When choosing the “<b>Malaysian MS-EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><b><math>k_1 = 40 \text{ mm}</math></b>  <b><math>k_2 = 65 \text{ mm}</math></b></p>
5.2 (5)	Using the default EN
5.5 (4)	<p>When choosing the “<b>Malaysian MS-EN NA method</b>” the values of coefficients to calculate the distributed moment when <math>f_{ck}</math> does not exceed 50 MPa are given in the National Annex:</p> <p>For reinforcement steel with <math>f_{yk} \leq 500 \text{ MPa}</math>:</p> <p><b><math>k_1 = k_3 = 0.4</math></b>  <b><math>k_2 = k_4 = 0.6 + 0.0014 / \epsilon_{cu2}</math></b>  <b><math>k_5 = 0.7</math></b>  <b><math>k_6 = 0.8</math></b></p> <p>For reinforcement steel with <math>f_{yk} &gt; 500 \text{ MPa}</math>:</p>

	<p><i>This reinforcement is not allowed; therefore</i></p> <p><b><math>k_1 = k_2 = k_3 = k_4 = k_5 = k_6 = 0</math></b></p>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<p><i>When choosing the “<b>Malaysian MS-EN NA method</b>” the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</i></p> <p><i>The values for pre-tension and post-tension <b><math>r_{sup} = r_{inf} = 1.0</math></b></i></p>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<p><i>When choosing the “<b>Malaysian MS-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</i></p> <p><i>In standard concrete:</i></p> <p><b><math>\theta_{min} = 21.80^\circ</math> (cotg = 2.5)</b></p> <p><i>In elements in which shear co-exists with externally applied tension</i></p> <p><b><math>\theta_{min} = 45^\circ</math> (cotg = 1.0)</b></p> <p><i>The values of maximum angle is using the default EN</i></p>
6.2.3 (3)	<p><i>When choosing the “<b>Malaysian MS-EN NA method</b>” the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</i></p> <p><b><math>v_1 = v</math></b></p> <p><i>If <math>\sigma_{swd} &lt; 0.8 \cdot f_{ywk}</math></i></p> <p><b><math>v_1 = 0.54 \cdot (1 - 0.5 \cdot \cos(\alpha_s))</math> for <math>f_{ck} \leq 60</math> MPa</b></p> <p><b><math>v_1 = \max((0.84 - (f_{ck} / 200)) \cdot (1 - 0.5 \cdot \cos(\alpha_s)); 0.5)</math> for <math>f_{ck} &gt; 60</math> MPa</b></p> <p><i>The coefficient taking account of the state of the stress in the compression chord <math>\alpha_{cw}</math> is using the default EN</i></p>

6.2.4 (4)	<i>Using the default EN</i>															
6.2.4 (6)	<i>Using the default EN</i>															
6.4.3 (6)	<i>Using the default EN</i>															
6.4.4 (1)	<i>Using the default EN</i>															
6.4.5 (3)	<i>Using the default EN</i>															
6.5.2 (2)	<i>Using the default EN</i>															
6.5.4 (4)	<i>Using the default EN</i>															
7.2 (2)	<i>Using the default EN</i>															
7.2 (3)	<i>Using the default EN</i>															
7.2 (5)	<i>Using the default EN</i>															
7.3.1 (5)	<p>When choosing the “<b>Malaysian MS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Quasi-permanent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD1, XD2, XS1, XS2, XS3</td> <td><b>0.3</b></td> <td><b>0.2 (decompression)</b></td> </tr> </tbody> </table>	Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Quasi-permanent load combination	Frequent load combination	X0, XC1	<b>0.3</b>	<b>0.2</b>	XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>	XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>
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XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>														
7.3.4 (3)	<i>Using the default EN</i>															
8.2 (2)	<i>Using the default EN</i>															
8.3 (2)	<i>Using the default EN</i>															
9.2.1.1 (1)	<i>Using the default EN</i>															
9.2.1.1 (3)	<i>Using the default EN</i>															
9.2.1.2 (1)	When choosing the “ <b>Malaysian MS-EN NA method</b> ” the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:															

	<b><math>\beta_1 = 0.25</math></b>
9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<i>Using the default EN</i>
9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<p>When choosing the “<b>Malaysian MS-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12 \text{ mm}</math></b></p>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<i>Using the default EN</i>
9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>
12.6.3 (2)	<i>Using the default EN</i>

## Norway

According to Norwegian National annex NS EN 1992-1-1:2004/NA:2010

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value partial factor for prestress action - favourable is given in the National Annex:</p> <p><b><math>\gamma_{P,fav} = 0.9</math></b></p>
2.4.2.2 (2)	When choosing the “ <b>Norwegian NS-EN NA method</b> ” the value partial factor for prestress action - unfavourable is given in the National Annex:

	<b><math>\gamma_{P,fav} = 1.3</math></b>
2.4.2.4 (1)	<p>Using the default EN</p> <p><i>Fatigue is not implemented in Scia Engineer</i></p>
3.1.2 (2)P	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of maximal concrete strength class is given in the National Annex:</p> <p>For shear strength: <b><math>C_{max} = B65 (C60/75)</math></b>  For other cases: <b><math>C_{max} = B95 (C95/110)</math></b></p>
3.1.6 (1)P	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b></p>
3.1.6 (2)P	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of coefficient taking account of long term effects on the tensile strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{ct} = 0.85</math></b></p>
3.2.2 (3)P	Using the default EN
3.2.7 (2)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of characteristic strain limit is given in the National Annex:</p> <p><b><math>\epsilon_{ud} / \epsilon_{uk} = 0.4</math></b></p> <p><i>V PRQ dokumentu k NA je něco o fy<sub>d</sub> – to nemáme v ese impelmentováno?</i></p>
3.3.4 (5)	Using the default EN
3.3.6 (7)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of characteristic strain limit is given in the National Annex:</p> <p><b><math>\epsilon_{ud} / \epsilon_{uk} = 0.4</math></b></p> <p><i>V PRQ dokumentu k NA je něco o fy<sub>d</sub> – to nemáme v ese impelmentováno?</i></p>
4.4.1.2 (3)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values of minimum cover for pre-tensioned tendons may be modified by the National Annex:</p> <p><i>if <math>d_g &gt; 32</math> mm, than <math>c_{min,b} + 5</math> mm</i></p>

<p>4.4.1.2 (5)</p>	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Table NA.4.4N and NA.4.5N are used:</p> <table border="1" data-bbox="496 338 1406 741"> <thead> <tr> <th colspan="7">Value of minimum cover <math>c_{min,dur}</math> according to exposure classes [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="6">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0</th> <th>XC1</th> <th>XC2 XC3 XC4</th> <th>XD1 XS1</th> <th>XD2 XD3 XS2</th> <th>XS3</th> </tr> </thead> <tbody> <tr> <td>Reinforcing steel Design working life 50 years</td> <td><math>c_{min,b}</math></td> <td>15</td> <td>25</td> <td>40</td> <td>40</td> <td>50</td> </tr> <tr> <td>Reinforcing steel Design working life 100 years</td> <td><math>c_{min,b}</math></td> <td>25</td> <td>35</td> <td>50</td> <td>50</td> <td>60</td> </tr> <tr> <td>Prestressing steel Design working life 50 years</td> <td><math>c_{min,b}</math></td> <td>25</td> <td>35</td> <td>50</td> <td>50</td> <td>60</td> </tr> <tr> <td>Prestressing steel Design working life 100 years</td> <td><math>c_{min,b}</math></td> <td>35</td> <td>45</td> <td>60</td> <td>60</td> <td>70</td> </tr> </tbody> </table>	Value of minimum cover $c_{min,dur}$ according to exposure classes [mm]							Criterion	Exposure class according to Table 4.1						X0	XC1	XC2 XC3 XC4	XD1 XS1	XD2 XD3 XS2	XS3	Reinforcing steel Design working life 50 years	$c_{min,b}$	15	25	40	40	50	Reinforcing steel Design working life 100 years	$c_{min,b}$	25	35	50	50	60	Prestressing steel Design working life 50 years	$c_{min,b}$	25	35	50	50	60	Prestressing steel Design working life 100 years	$c_{min,b}$	35	45	60	60	70
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<p>4.4.1.2 (13)</p>	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values coefficients for increasing concrete cover for abrasion classes are given in the National Annex:</p> <p><b><math>k_1 = k_2 = k_3 = 0 \text{ mm}</math></b></p>																																																
<p>4.4.1.3 (1)P</p>	<p>Using the default EN</p>																																																
<p>4.4.1.3 (3)</p>	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values of accepted deviations for increasing of nominal concrete cover are given in the National Annex:</p> <p>with special geometric control: <b><math>\Delta c_{dev} = 5 \text{ mm}</math></b>  without special geometric control: <b><math>\Delta c_{dev} = 10 \text{ mm}</math></b></p>																																																
<p>4.4.1.3 (4)</p>	<p>Using the default EN</p>																																																
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<p>5.5 (4)</p>	<p>Using the default EN</p>																																																
<p>5.8.3.1 (1)</p>	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the slenderness criterion where second order effects may be ignored is given in the National Annex:</p>																																																

	<p><math>\lambda_n \leq \lambda_{n,lim}</math></p> <p>where: for compression members where the ends are braced and that do not have transverse load: <math>\lambda_{n,lim} = 13 \cdot (2 - r_m) \cdot A_\varphi</math> for compression members where one end is unbraced and for compression members that have transverse load: <math>\lambda_{n,lim} = 13 \cdot A_\varphi</math></p> <p>where: <math>r_m = M_{01} / M_{02}</math> – ratio between numerically least and greatest first order end moments if <math>M_{02} &lt; N_d \cdot h / 20</math>, <math>r_m = 1</math> <math>r_m</math> is positive when both end moments give tension on same side</p> <p><math>A_\varphi = 1.25 / (1 + 0.2 \cdot \varphi_{ef}) \leq 1</math> <math>\lambda_n = \lambda \cdot (n / (1 + 2 \cdot k_a \cdot \omega))^{1/2}</math> ... normalised slenderness</p> <p>where: <math>\lambda = l_0 / I</math> ... see clause 5.8.3.2 <math>k_a = (i_s / i)^2</math> <math>i_s</math> ... radius of gyration of the reinforcement <math>i</math> ... radius of gyration of uncracked concrete section <math>n = N_{Ed} / f_{cd} \cdot A_c</math> ... relative axial force <math>\omega = f_{yd} \cdot A_s / f_{cd} \cdot A_c</math> ... mechanical reinforcement ratio</p>
5.10.2.1 (1)P	Using the default EN
5.10.2.1 (2)	Using the default EN
5.10.2.2 (5)	Using the default EN
5.10.3 (2)	Using the default EN
5.10.9 (1)P	Using the default EN
6.2.2 (1)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values for calculation of shear resistance of members not requiring design shear reinforcement are given in the National Annex:</p> <p>for <math>d_g &lt; 16</math> mm: <math>c_{Rd,c} = 0.15 / \gamma_c</math> for <math>d_g \geq 16</math> mm: <math>c_{Rd,c} = 0.18 / \gamma_c</math></p> <p>for compression: <math>k_1 = 0.15</math> for tension: <math>k_1 = 0.30</math></p> <p><math>v_{min} = 0.0035 \cdot k^{3/2} \cdot f_{ck}^{1/2}</math></p>

6.2.2 (6)	Using the default EN
6.2.3 (2)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p>In standard concrete:  <math>\theta_{min} = 21.80^\circ</math> (cotg = 2.5)  In sections with significant axial tension (<math>\sigma_{ct} \geq f_{ctk,0,05}</math>)  <math>\theta_{min} = 38.66^\circ</math> (cotg = 1.25)</p> <p>The values of maximum angle are using the default EN</p>
6.2.3 (3)	Using the default EN
6.2.4 (4)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values for calculation to prevent crushing of the compression struts in the flange are given in the National Annex:</p> <p><math>\theta_{min,c} = 21.80^\circ</math> (cotg = 2.5)</p> <p>The values of minimum angle in tension and maximum angles are using the default EN</p>
6.2.4 (6)	Using the default EN
6.4.3 (6)	Using the default EN
6.4.4 (1)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values for calculation punching shear resistance of slabs and column bases without shear resistance are given in the National Annex:</p> <p>for <math>d_g &lt; 16</math> mm: <math>c_{Rd,c} = 0.15 / \gamma_c</math>  for <math>d_g \geq 16</math> mm: <math>c_{Rd,c} = 0.18 / \gamma_c</math></p> <p>for compression: <math>k_1 = 0.10</math>  for tension: <math>k_1 = 0.30</math></p> <p><math>v_{min} = 0.0035 \cdot k^{3/2} \cdot f_{ck}^{1/2}</math></p>
6.4.5 (3)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the limitation for maximum shear resistance is given in the National Annex:</p> <p><math>v_{Rd,max} = 0.4 \cdot v \cdot f_{cd} \leq 1.6 \cdot v_{Rd,c} \cdot u_1 / (\beta \cdot u_0)</math></p> <p>where <math>v_{Rd,c}</math> is without contribution of axial stress (i.e. <math>k_1 \sigma_{cp} = 0</math>)</p>
6.5.2 (2)	Using the default EN



6.5.4 (4)	Using the default EN																																				
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7.3.1 (5)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p>Table NA.7.1N is used</p> <table border="1"> <thead> <tr> <th rowspan="2">Exposure Class</th> <th colspan="2">Reinforced members and prestressed members with unbonded tendons</th> <th colspan="2">Prestressed members with bonded tendons</th> </tr> <tr> <th>Load combination</th> <th>Limiting value <math>W_{max}</math></th> <th>Load combination</th> <th>Limiting value <math>W_{max}</math></th> </tr> </thead> <tbody> <tr> <td>X0</td> <td>Quasi-permanent</td> <td><b>0.40</b></td> <td>Frequent</td> <td><b><math>0.30 \cdot k_c</math></b></td> </tr> <tr> <td>XC1, XC2, XC3, XC4</td> <td>Quasi-permanent</td> <td><b><math>0.30 \cdot k_c</math></b></td> <td>Frequent</td> <td><b><math>0.20 \cdot k_c</math></b></td> </tr> <tr> <td rowspan="2">XD1, XD2, XS1, XS2</td> <td rowspan="2">Quasi-permanent</td> <td rowspan="2"><b><math>0.30 \cdot k_c</math></b></td> <td>Frequent</td> <td><b><math>0.20 \cdot k_c</math></b></td> </tr> <tr> <td>Quasi-permanent</td> <td><b>Decompression</b></td> </tr> <tr> <td>XD3, XS3</td> <td>Frequent</td> <td><b><math>0.30 \cdot k_c</math></b></td> <td>Frequent</td> <td><b>Decompression</b></td> </tr> <tr> <td>XSA</td> <td>Frequent</td> <td><b><math>0.30 \cdot k_c</math></b></td> <td>Frequent</td> <td><b>Decompression</b></td> </tr> </tbody> </table> <p>where:  <b><math>k_c = C_{nom} / C_{min,dur} \leq 1.3</math></b></p>	Exposure Class	Reinforced members and prestressed members with unbonded tendons		Prestressed members with bonded tendons		Load combination	Limiting value $W_{max}$	Load combination	Limiting value $W_{max}$	X0	Quasi-permanent	<b>0.40</b>	Frequent	<b><math>0.30 \cdot k_c</math></b>	XC1, XC2, XC3, XC4	Quasi-permanent	<b><math>0.30 \cdot k_c</math></b>	Frequent	<b><math>0.20 \cdot k_c</math></b>	XD1, XD2, XS1, XS2	Quasi-permanent	<b><math>0.30 \cdot k_c</math></b>	Frequent	<b><math>0.20 \cdot k_c</math></b>	Quasi-permanent	<b>Decompression</b>	XD3, XS3	Frequent	<b><math>0.30 \cdot k_c</math></b>	Frequent	<b>Decompression</b>	XSA	Frequent	<b><math>0.30 \cdot k_c</math></b>	Frequent	<b>Decompression</b>
Exposure Class	Reinforced members and prestressed members with unbonded tendons		Prestressed members with bonded tendons																																		
	Load combination	Limiting value $W_{max}$	Load combination	Limiting value $W_{max}$																																	
X0	Quasi-permanent	<b>0.40</b>	Frequent	<b><math>0.30 \cdot k_c</math></b>																																	
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7.3.4 (3)	Using the default EN																																				
8.2 (2)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:</p> <p>For bars in same layer: <b><math>k_1 = 2.0</math></b>  For bars in different layer: <b><math>k_1 = 1.5</math></b>  <b><math>k_2 = 5 \text{ mm}</math></b></p>																																				
8.3 (2)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the values of minimum mandrel diameter of bars and wires for bends, hooks and loops are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Bar diameter</th> <th>Minimum mandrel</th> </tr> </thead> <tbody> <tr> <td><b><math>\phi \leq 16 \text{ mm}</math></b></td> <td><b><math>4\phi</math></b></td> </tr> <tr> <td><b><math>16 \text{ mm} &lt; \phi \leq 32 \text{ mm}</math></b></td> <td><b><math>7\phi</math></b></td> </tr> <tr> <td><b><math>\phi &gt; 32 \text{ mm}</math></b></td> <td><b><math>10\phi</math></b></td> </tr> </tbody> </table> <p>Other values from table NA.8.1 are not implemented</p>	Bar diameter	Minimum mandrel	<b><math>\phi \leq 16 \text{ mm}</math></b>	<b><math>4\phi</math></b>	<b><math>16 \text{ mm} &lt; \phi \leq 32 \text{ mm}</math></b>	<b><math>7\phi</math></b>	<b><math>\phi &gt; 32 \text{ mm}</math></b>	<b><math>10\phi</math></b>																												
Bar diameter	Minimum mandrel																																				
<b><math>\phi \leq 16 \text{ mm}</math></b>	<b><math>4\phi</math></b>																																				
<b><math>16 \text{ mm} &lt; \phi \leq 32 \text{ mm}</math></b>	<b><math>7\phi</math></b>																																				
<b><math>\phi &gt; 32 \text{ mm}</math></b>	<b><math>10\phi</math></b>																																				

9.2.1.1 (1)	Using the default EN
9.2.1.1 (3)	Using the default EN
9.2.1.2 (1)	Using the default EN
9.2.2 (5)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the formula for calculation minimum ratio of shear reinforcement is given in the National Annex:</p> $\rho_{w,min} = (0.1 \cdot \sqrt{f_{ck}}) / f_{yk}$
9.2.2 (6)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the formula for calculation maximum spacing between shear assemblies is given in the National Annex:</p> $s_{l,max} = 0.60 \cdot h' \cdot (1 + \cot \alpha)$ <p>where:  <i>h'</i> is the distance of the centre of gravity of the tension and the compression reinforcement</p>
9.2.2 (8)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the formula for calculation maximum transverse spacing of the legs in series is given in the National Annex:</p> $s_{t,max} = h' \leq 600 \text{ mm}$ <p>where:  <i>h'</i> is the distance of the centre of gravity of the tension and the compression reinforcement</p>
9.3.1.1(3)	Using the default EN
9.5.2 (1)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> $\phi_{min} = 10 \text{ mm}$
9.5.2 (2)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p> $A_{s,min} = 0.2 \cdot A_c \cdot f_{cd} / f_{yd} \leq 0.5 \cdot N_{Ed} / f_{yd} \leq 0.01 \cdot A_c$
9.5.2 (3)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the formula for calculation maximum area of longitudinal reinforcement in column is given in the National Annex:</p>

	$A_{s,max} = 0.08 \cdot A_c$
9.5.3 (3)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 400 \text{ mm})</math>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p> <p>if <math>A_{sl} &gt; 0.04 \cdot A_c</math> or concrete strength class is B55 or greater:  <math>s_{cl,tmax}</math> is multiplied by factor <b>0.6</b></p>
9.6.2 (1)	Using the default EN
9.6.3 (1)	<p>When choosing the “<b>Norwegian NS-EN NA method</b>” the formula for calculation minimum area of horizontal reinforcement in wall is given in the National Annex:</p> <p>for exterior walls:  <math>A_{s,hmin} = \max(0.25 \cdot A_{s,v}; 0.30 \cdot A_c \cdot f_{ctm} / f_{yk})</math></p> <p>for interior walls:  <math>A_{s,hmin} = \max(0.25 \cdot A_{s,v}; 0.15 \cdot A_c \cdot f_{ctm} / f_{yk})</math></p>
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Poland

According to Polish National annex PN EN 1992-1-1/NA:2008

Article	Commentary
2.4.2.1 (1)	Using the default EN
2.4.2.2 (1)	Using the default EN
2.4.2.2 (2)	Using the default EN
2.4.2.4 (1)	When choosing the “ <b>Polish PN-EN NA method</b> ” the values of partial factors for materials for ultimate limit states are given in the National Annex:

	<i>Design situations</i>	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing steel	$\gamma_s$ for prestressing steel
	<i>Persistent &amp; Transient</i>	<b>1.4</b>	<b>1.15</b>	<b>1.15</b>
	<i>Accidental</i>	<b>1.2</b>	<b>1.0</b>	<b>1.0</b>
3.1.2 (2)P	<i>Using the default EN</i>			
3.1.6 (1)P	<i>Using the default EN</i>			
3.1.6 (2)P	<i>Using the default EN</i>			
3.2.2 (3)P	<i>Using the default EN</i>			
3.2.7 (2)	<i>Using the default EN</i>			
3.3.4 (5)	<i>Using the default EN</i>			
3.3.6 (7)	<i>Using the default EN</i>			
4.4.1.2 (3)	<i>Using the default EN</i>			
4.4.1.2 (5)	<i>Using the default EN</i>			
4.4.1.2 (6)	<i>Using the default EN</i>			
4.4.1.2 (7)	<i>Using the default EN</i>			
4.4.1.2 (8)	<i>Using the default EN</i>			
4.4.1.2 (13)	<i>Using the default EN</i>			
4.4.1.3 (1)P	<i>Using the default EN</i>			
4.4.1.3 (3)	<i>Using the default EN</i>			
4.4.1.3 (4)	<i>Using the default EN</i>			
5.2 (5)	<i>Using the default EN</i>			
5.5 (4)	<i>Using the default EN</i>			
5.8.3.1 (1)	<i>Using the default EN</i>			

5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<p>When choosing the “<b>Polish PN-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p><b><math>\theta_{min} = 26.56^\circ</math> (cotg = 2.0)</b></p> <p><i>The values of maximum angle are using the default EN</i></p>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>
6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>
6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<p>When choosing the “<b>Polish PN-EN NA method</b>” the coefficient for limit compressive stress is given in the National Annex:</p> <p><b><math>k_1 = 1.0</math></b></p>
7.2 (3)	<i>Using the default EN</i>
7.2 (5)	<i>Using the default EN</i>
7.3.1 (5)	<i>Using the default EN</i>

7.3.4 (3)	<i>Using the default EN</i>
8.2 (2)	<i>Using the default EN</i>
8.3 (2)	<i>Using the default EN</i>
9.2.1.1 (1)	<i>Using the default EN</i>
9.2.1.1 (3)	<i>Using the default EN</i>
9.2.1.2 (1)	<i>Using the default EN</i>
9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<i>Using the default EN</i>
9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<p>When choosing the “<b>Polish PN-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 6 \text{ mm}</math></b></p>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<i>Using the default EN</i>
9.6.2 (1)	<i>Using the default EN</i>
9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>
12.6.3 (2)	<i>Using the default EN</i>

## Romania

According to Romanian National annex SR EN 1992-1-1:2004/NB:2008

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<i>Using the default EN</i>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<i>Using the default EN</i>
3.1.6 (1)P	<i>Using the default EN</i>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<p>When choosing the “<b>Romanian SR-EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 500 \text{ MPa}</math></b></p>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<i>Using the default EN</i>
4.4.1.2 (5)	<i>Using the default EN</i>
4.4.1.2 (6)	<i>Using the default EN</i>
4.4.1.2 (7)	<i>Using the default EN</i>
4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>
4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>

5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<i>Using the default EN</i>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>
6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>
6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<i>Using the default EN</i>
7.2 (3)	<i>Using the default EN</i>
7.2 (5)	<i>Using the default EN</i>
7.3.1 (5)	<i>Using the default EN</i>
7.3.4 (3)	<i>Using the default EN</i>



8.2 (2)	Using the default EN
8.3 (2)	Using the default EN
9.2.1.1 (1)	Using the default EN
9.2.1.1 (3)	Using the default EN
9.2.1.2 (1)	Using the default EN
9.2.2 (5)	Using the default EN
9.2.2 (6)	Using the default EN
9.2.2 (8)	<p>When choosing the “<b>Romanian SR-EN NA method</b>” the formula for calculation maximum transverse spacing of the legs in series is given in the National Annex:</p> <p><b><math>s_{t,max} = 0.75 \cdot d \leq 350 \text{ mm}</math></b></p>
9.3.1.1(3)	<p>When choosing the “<b>Romanian SR-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>for principal reinforcement: <b><math>s_{max,slab} = 2.0 \cdot h \leq 250 \text{ mm}</math></b>  for secondary reinforcement: <b><math>s_{max,slab} = 3.0 \cdot h \leq 350 \text{ mm}</math></b></p>
9.5.2 (1)	<p>When choosing the “<b>Romanian SR-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12 \text{ mm}</math></b></p>
9.5.2 (2)	<p>When choosing the “<b>Romanian SR-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,min} = 0.10 \cdot N_{Ed} / f_{yd} \geq 0.004 \cdot A_c</math></b></p>
9.5.2 (3)	Using the default EN
9.5.3 (3)	<p>When choosing the “<b>Romanian SR-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><b><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 300 \text{ mm})</math></b>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p>

9.6.2 (1)	Using the default EN
9.6.3 (1)	When choosing the “ <b>Romanian SR-EN NA method</b> ” the formula for calculation minimum area of horizontal reinforcement in wall is given in the National Annex:  $A_{s,hmin} = \max(0.25 \cdot A_{s,v}; 0.001 \cdot A_c)$
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Singapore

According to Singaporean National annex SS EN 1992-1-1:2008+A1:2010

Article	Commentary
2.4.2.1 (1)	Using the default EN
2.4.2.2 (1)	When choosing the “ <b>Singaporean SS-EN NA method</b> ” the value partial factor for prestress action - favourable is given in the National Annex:  $\gamma_{P,fav} = 0.9$
2.4.2.2 (2)	When choosing the “ <b>Singaporean SS-EN NA method</b> ” the value partial factor for prestress action - unfavourable is given in the National Annex:  $\gamma_{P,fav} = 1.1$
2.4.2.4 (1)	Using the default EN
3.1.2 (2)P	When choosing the “ <b>Singaporean SS-EN NA method</b> ” the value of maximal concrete strength class is given in the National Annex:  For shear strength: $C_{max} = C50/60$ For other cases: $C_{max} = C90/105$
3.1.6 (1)P	When choosing the “ <b>Singaporean SS-EN NA method</b> ” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:  $\alpha_{cc} = 0.85$ for compression in flexure and axial loading $\alpha_{cc} = 1.0$ for other phenomena

3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<i>Using the default EN</i>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<i>Using the default EN</i>
4.4.1.2 (5)	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Use SS 544-1:2009, tables A.4 and A.5</p>
4.4.1.2 (6)	<i>Using the default EN</i>
4.4.1.2 (7)	<i>Using the default EN</i>
4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>
4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the values of coefficients to calculate the distributed moment when <math>f_{ck}</math> does not exceed 50 MPa are given in the National Annex:</p> <p>For reinforcement steel with <math>f_{yk} \leq 500</math> MPa:</p> <p><b><math>k_1 = k_3 = 0.4</math></b>  <b><math>k_2 = k_4 = 0.6 + 0.0014 / \epsilon_{cu2}</math></b>  <b><math>k_5 = 0.7</math></b>  <b><math>k_6 = 0.8</math></b></p> <p>For reinforcement steel with <math>f_{yk} &gt; 500</math> MPa:  This reinforcement is not allowed; therefore  <b><math>k_1 = k_2 = k_3 = k_4 = k_5 = k_6 = 0</math></b></p>

5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the values of factors to consider the possible upper and lower variation in the prestress in pre-tension or unbonded tendons are given in the National Annex:</p> <p>The values for pre-tension and post-tension <math>r_{sup} = r_{inf} = 1.0</math></p>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p>In standard concrete:  <math>\theta_{min} = 21.80^\circ</math> (<math>\cot\theta = 2.5</math>)</p> <p>In elements in which shear co-exists with externally applied tension  <math>\theta_{min} = 45^\circ</math> (<math>\cot\theta = 1.0</math>)</p> <p>The values of maximum angle are using the default EN</p>
6.2.3 (3)	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the values for calculation of shear resistance of members with vertical shear reinforcement are given in the National Annex:</p> <p><math>v_1 = v</math></p> <p>If <math>\sigma_{swd} &lt; 0.8 \cdot f_{ywk}</math>  <math>v_1 = 0.54 \cdot (1 - 0.5 \cdot \cos(\alpha_s))</math> for <math>f_{ck} \leq 60</math> MPa  <math>v_1 = \max((0.84 - (f_{ck} / 200)) \cdot (1 - 0.5 \cdot \cos(\alpha_s)); 0.5)</math> for <math>f_{ck} &gt; 60</math> MPa</p> <p>The coefficient taking account of the state of the stress in the compression chord <math>\alpha_{cw}</math> is using the default EN</p>
6.2.4 (4)	<i>Using the default EN</i>

6.2.4 (6)	<i>Using the default EN</i>																	
6.4.3 (6)	<i>Using the default EN</i>																	
6.4.4 (1)	<i>Using the default EN</i>																	
6.4.5 (3)	<p>When choosing the <b>“Singaporean SS-EN NA method”</b> the additional limitation for maximum shear resistance is given in the National Annex:</p> $V_{Rd,max} = 0.5 \cdot v \cdot f_{cd} \leq 2.0 \cdot V_{Rd,c}$																	
6.5.2 (2)	<i>Using the default EN</i>																	
6.5.4 (4)	<i>Using the default EN</i>																	
7.2 (2)	<i>Using the default EN</i>																	
7.2 (3)	<i>Using the default EN</i>																	
7.2 (5)	<i>Using the default EN</i>																	
7.3.1 (5)	<p>When choosing the <b>“Singaporean SS-EN NA method”</b> the values of maximal calculated crack width are given in the National Annex:</p> <table border="1" data-bbox="496 1131 1426 1467"> <thead> <tr> <th rowspan="2">Exposure class</th> <th>Reinforced members and prestressed members with unbonded tendons</th> <th>Prestressed members with bonded tendons</th> </tr> </thead> <tbody> <tr> <td></td> <td>Quasi-permanent load combination</td> <td>Frequent load combination</td> </tr> <tr> <td>X0, XC1</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XC2, XC3, XC4</td> <td><b>0.3</b></td> <td><b>0.2</b></td> </tr> <tr> <td>XD1, XD2, XS1, XS2, XS3</td> <td><b>0.3</b></td> <td><b>0.2 (decompression)</b></td> </tr> </tbody> </table>			Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		Quasi-permanent load combination	Frequent load combination	X0, XC1	<b>0.3</b>	<b>0.2</b>	XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>	XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>
Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons																
		Quasi-permanent load combination	Frequent load combination															
X0, XC1	<b>0.3</b>	<b>0.2</b>																
XC2, XC3, XC4	<b>0.3</b>	<b>0.2</b>																
XD1, XD2, XS1, XS2, XS3	<b>0.3</b>	<b>0.2 (decompression)</b>																
7.3.4 (3)	<i>Using the default EN</i>																	
8.2 (2)	<i>Using the default EN</i>																	
8.3 (2)	<i>Using the default EN</i>																	
9.2.1.1 (1)	<i>Using the default EN</i>																	
9.2.1.1 (3)	<i>Using the default EN</i>																	
9.2.1.2 (1)	<p>When choosing the <b>“Singaporean SS-EN NA method”</b> the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:</p>																	

	<b><math>\beta_1 = 0.25</math></b>
9.2.2 (5)	<i>Using the default EN</i>
9.2.2 (6)	<i>Using the default EN</i>
9.2.2 (8)	<i>Using the default EN</i>
9.3.1.1(3)	<i>Using the default EN</i>
9.5.2 (1)	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12 \text{ mm}</math></b></p>
9.5.2 (2)	<i>Using the default EN</i>
9.5.2 (3)	<i>Using the default EN</i>
9.5.3 (3)	<p><i>Using the default EN</i></p> <p><i>Special method for concrete class &gt; C50/60 is not implemented</i></p>
9.6.2 (1)	<i>Using the default EN</i>
9.6.3 (1)	<i>Using the default EN</i>
9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<p>When choosing the “<b>Singaporean SS-EN NA method</b>” the coefficients taking account of long term effects on the compressive and tensile strength and of unfavourable effects resulting from the way the load is applied for plain concrete are given in the National Annex:</p> <p><b><math>\alpha_{cc,pl} = 0.60</math></b></p> <p><b><math>\alpha_{ct,pl} = 0.80</math></b></p>
12.6.3 (2)	<i>Using the default EN</i>

## Slovakia

According to Slovakian National annex STN EN 1992-1-1/NA:2008-08

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>

2.4.2.2 (1)	<i>Using the default EN</i>																																																																							
2.4.2.2 (2)	<i>Using the default EN</i>																																																																							
2.4.2.4 (1)	<i>Using the default EN</i>																																																																							
3.1.2 (2)P	<i>Using the default EN</i>																																																																							
3.1.6 (1)P	<i>Using the default EN</i>																																																																							
3.1.6 (2)P	<i>Using the default EN</i>																																																																							
3.2.2 (3)P	<i>Using the default EN</i>																																																																							
3.2.7 (2)	<i>Using the default EN</i>																																																																							
3.3.4 (5)	<i>Using the default EN</i>																																																																							
3.3.6 (7)	<i>Using the default EN</i>																																																																							
4.4.1.2 (3)	<i>Using the default EN</i>																																																																							
4.4.1.2 (5)	<p>When choosing the “<b>Slovakian STN-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Table 4.3N is used:</p> <table border="1"> <thead> <tr> <th rowspan="2">Criterion</th> <th colspan="8">Structural Class</th> </tr> <tr> <th colspan="8">Exposure class according to Table 4.1</th> </tr> <tr> <th></th> <th>X0</th> <th>XC1</th> <th>XC2</th> <th>XC3</th> <th>XC4</th> <th>XD1</th> <th>XD2</th> <th>XD3</th> </tr> </thead> <tbody> <tr> <td>Design Working Life of 80 years</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> <td>increase class by 1</td> </tr> <tr> <td>Design Working Life of 100 years</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> </tr> <tr> <td>Strength Class</td> <td><math>\geq</math> C20/25 reduce class by 1</td> <td><math>\geq</math> C25/30 reduce class by 1</td> <td><math>\geq</math> C30/37 reduce class by 1</td> <td><math>\geq</math> C35/45 reduce class by 1</td> <td><math>\geq</math> C40/50 reduce class by 1</td> <td><math>\geq</math> C40/50 reduce class by 1</td> <td><math>\geq</math> C40/50 reduce class by 1</td> <td><math>\geq</math> C45/55 reduce class by 1</td> </tr> <tr> <td>Members with slab geometry</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> </tr> <tr> <td>Special Quality Control</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> </tr> </tbody> </table> <p>Tables 4.4 and 4.5 are used from default EN</p>	Criterion	Structural Class								Exposure class according to Table 4.1									X0	XC1	XC2	XC3	XC4	XD1	XD2	XD3	Design Working Life of 80 years	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	Design Working Life of 100 years	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	Strength Class	$\geq$ C20/25 reduce class by 1	$\geq$ C25/30 reduce class by 1	$\geq$ C30/37 reduce class by 1	$\geq$ C35/45 reduce class by 1	$\geq$ C40/50 reduce class by 1	$\geq$ C40/50 reduce class by 1	$\geq$ C40/50 reduce class by 1	$\geq$ C45/55 reduce class by 1	Members with slab geometry	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	Special Quality Control	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1
Criterion	Structural Class																																																																							
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Design Working Life of 80 years	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1	increase class by 1																																																																
Design Working Life of 100 years	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2																																																																
Strength Class	$\geq$ C20/25 reduce class by 1	$\geq$ C25/30 reduce class by 1	$\geq$ C30/37 reduce class by 1	$\geq$ C35/45 reduce class by 1	$\geq$ C40/50 reduce class by 1	$\geq$ C40/50 reduce class by 1	$\geq$ C40/50 reduce class by 1	$\geq$ C45/55 reduce class by 1																																																																
Members with slab geometry	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1	reduce class by 1																																																																
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4.4.1.2 (6)	<i>Using the default EN</i>																																																																							

4.4.1.2 (7)	<i>Using the default EN</i>
4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>
4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>
5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<p>When choosing the “<b>Slovakian STN-EN NA method</b>” the expression used in default EN remains unchanged, however the expression is limited:</p> <p><b><math>\lambda_{lim} \leq 75</math></b></p>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<i>Using the default EN</i>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>



6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>
6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<i>Using the default EN</i>
7.2 (3)	<i>Using the default EN</i>
7.2 (5)	<i>Using the default EN</i>
7.3.1 (5)	<i>Using the default EN</i>
NCI to 7.3.2(3)	<p>When choosing the <b>“Slovakian STN-EN NA method”</b> the conditions for calculation <math>h_{c,ef}</math> are given in the National Annex:</p> <p>When <math>x_r</math> is greater or equal to <math>0.25 \cdot h</math> the depth of effective area of the concrete is calculated by followed formula.  <math display="block">h_{c,ef} = \min(2.5 \cdot (h - d), (h - x_r) / 3, h/2)</math></p> <p>When <math>x_r</math> is lower than <math>0.25 \cdot h</math> the depth of effective area of the concrete is calculated by next formula.  <math display="block">h_{c,ef} = \min(2.5 \cdot (h - d), h/2)</math></p>
7.3.4 (3)	<i>Using the default EN</i>
8.2 (2)	<p>When choosing the <b>“Slovakian STN-EN NA method”</b> the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:</p> <p><math>k_1 = 1.5</math>  <math>k_2 = 5 \text{ mm}</math></p>
8.3 (2)	<i>Using the default EN</i>
9.2.1.1 (1)	<i>Using the default EN</i>
9.2.1.1 (3)	<i>Using the default EN</i>
9.2.1.2 (1)	<p>When choosing the <b>“Slovakian STN-EN NA method”</b> the value of coefficient for minimum ratio of span bending moment to be assumed at support in monolithic construction is given in the National Annex:</p> <p><math>\beta_1 = 0.25</math></p>

9.2.2 (5)	Using the default EN
9.2.2 (6)	When choosing the “ <b>Slovakian STN-EN NA method</b> ” the expression used in default EN remains unchanged, however the expression is limited:  <b><math>s_{l,max} \leq 400 \text{ mm}</math></b>
9.2.2 (8)	Using the default EN
9.3.1.1(3)	When choosing the “ <b>Slovakian STN-EN NA method</b> ” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:  for principal reinforcement: <b><math>s_{max,slab} = 2.0 \cdot h \leq 300 \text{ mm}</math></b> for secondary reinforcement: <b><math>s_{max,slab} = 3.0 \cdot h \leq 400 \text{ mm}</math></b>  Concentrated areas are not recognised
9.5.2 (1)	When choosing the “ <b>Slovakian STN-EN NA method</b> ” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:  <b><math>\phi_{min} = 10 \text{ mm}</math></b>
9.5.2 (2)	Using the default EN
9.5.2 (3)	Using the default EN
9.5.3 (3)	When choosing the “ <b>Slovakian STN-EN NA method</b> ” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:  <b><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 300 \text{ mm})</math></b> where: $\phi_l$ is minimum diameter of the longitudinal bars $b_{min}$ is the lesser dimension of the column
9.6.2 (1)	Using the default EN
9.6.3 (1)	Using the default EN
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Slovenia

According to Slovenian National annex SIST EN 1992-1-1/AC:2008

Article	Commentary
2.4.2.1 (1)	<i>Using the default EN</i>
2.4.2.2 (1)	<i>Using the default EN</i>
2.4.2.2 (2)	<i>Using the default EN</i>
2.4.2.4 (1)	<i>Using the default EN</i>
3.1.2 (2)P	<i>Using the default EN</i>
3.1.6 (1)P	<i>Using the default EN</i>
3.1.6 (2)P	<i>Using the default EN</i>
3.2.2 (3)P	<i>Using the default EN</i>
3.2.7 (2)	<i>Using the default EN</i>
3.3.4 (5)	<i>Using the default EN</i>
3.3.6 (7)	<i>Using the default EN</i>
4.4.1.2 (3)	<i>Using the default EN</i>
4.4.1.2 (5)	<i>Using the default EN</i>
4.4.1.2 (6)	<i>Using the default EN</i>
4.4.1.2 (7)	<i>Using the default EN</i>
4.4.1.2 (8)	<i>Using the default EN</i>
4.4.1.2 (13)	<i>Using the default EN</i>
4.4.1.3 (1)P	<i>Using the default EN</i>
4.4.1.3 (3)	<i>Using the default EN</i>
4.4.1.3 (4)	<i>Using the default EN</i>
5.2 (5)	<i>Using the default EN</i>

5.5 (4)	<i>Using the default EN</i>
5.8.3.1 (1)	<i>Using the default EN</i>
5.10.2.1 (1)P	<i>Using the default EN</i>
5.10.2.1 (2)	<i>Using the default EN</i>
5.10.2.2 (5)	<i>Using the default EN</i>
5.10.3 (2)	<i>Using the default EN</i>
5.10.9 (1)P	<i>Using the default EN</i>
6.2.2 (1)	<i>Using the default EN</i>
6.2.2 (6)	<i>Using the default EN</i>
6.2.3 (2)	<i>Using the default EN</i>
6.2.3 (3)	<i>Using the default EN</i>
6.2.4 (4)	<i>Using the default EN</i>
6.2.4 (6)	<i>Using the default EN</i>
6.4.3 (6)	<i>Using the default EN</i>
6.4.4 (1)	<i>Using the default EN</i>
6.4.5 (3)	<i>Using the default EN</i>
6.5.2 (2)	<i>Using the default EN</i>
6.5.4 (4)	<i>Using the default EN</i>
7.2 (2)	<i>Using the default EN</i>
7.2 (3)	<i>Using the default EN</i>
7.2 (5)	<i>Using the default EN</i>
7.3.1 (5)	<i>Using the default EN</i>
7.3.4 (3)	<i>Using the default EN</i>

8.2 (2)	Using the default EN
8.3 (2)	Using the default EN
9.2.1.1 (1)	Using the default EN
9.2.1.1 (3)	Using the default EN
9.2.1.2 (1)	Using the default EN
9.2.2 (5)	Using the default EN
9.2.2 (6)	Using the default EN
9.2.2 (8)	Using the default EN
9.3.1.1(3)	Using the default EN
9.5.2 (1)	<p>When choosing the “<b>Slovenian SIST-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12 \text{ mm}</math></b></p>
9.5.2 (2)	<p>When choosing the “<b>Slovenian SIST-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,min} = 0.10 \cdot N_{Ed} / f_{yd} \geq 0.003 \cdot A_c</math></b></p>
9.5.2 (3)	Using the default EN
9.5.3 (3)	<p>When choosing the “<b>Slovenian SIST-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><b><math>s_{cl,tmax} = \min(12 \cdot \phi_l; b_{min}; 300 \text{ mm})</math></b></p> <p>where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <math>b_{min}</math> is the lesser dimension of the column</p>
9.6.2 (1)	<p>When choosing the “<b>Slovenian SIST-EN NA method</b>” the formula for calculation minimum and maximum area of vertical reinforcement in wall is given in the National Annex:</p> <p><b><math>A_{s,vmin} = 0.003 \cdot A_c</math></b>  <b><math>A_{s,vmax} = 0.04 \cdot A_c</math></b></p>
9.6.3 (1)	Using the default EN

9.7 (1)	<i>Using the default EN</i>
12.3.1 (1)	<i>Using the default EN</i>
12.6.3 (2)	<i>Using the default EN</i>

## Spain

According to Spanish National annex UNE-EN 1992-1-1:2004/AN:2015-10

Article	Commentary												
2.4.2.1 (1)	<i>Using the default EN</i>												
2.4.2.2 (1)	<i>Using the default EN</i>												
2.4.2.2 (2)	<i>Using the default EN</i>												
2.4.2.4 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the values of partial factors for materials for ultimate limit states are given in the National Annex:</p> <table border="1"> <thead> <tr> <th>Design situations</th> <th><math>\gamma_c</math> for concrete</th> <th><math>\gamma_s</math> for reinforcing steel</th> <th><math>\gamma_s</math> for prestressing steel</th> </tr> </thead> <tbody> <tr> <td>Persistent &amp; Transient</td> <td><b>1.5</b></td> <td><b>1.15</b></td> <td><b>1.1</b></td> </tr> <tr> <td>Accidental</td> <td><b>1.3</b></td> <td><b>1.0</b></td> <td><b>1.0</b></td> </tr> </tbody> </table>	Design situations	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing steel	$\gamma_s$ for prestressing steel	Persistent & Transient	<b>1.5</b>	<b>1.15</b>	<b>1.1</b>	Accidental	<b>1.3</b>	<b>1.0</b>	<b>1.0</b>
Design situations	$\gamma_c$ for concrete	$\gamma_s$ for reinforcing steel	$\gamma_s$ for prestressing steel										
Persistent & Transient	<b>1.5</b>	<b>1.15</b>	<b>1.1</b>										
Accidental	<b>1.3</b>	<b>1.0</b>	<b>1.0</b>										
3.1.2 (2)P	<i>Using the default EN</i>												
3.1.6 (1)P	<i>Using the default EN</i>												
3.1.6 (2)P	<i>Using the default EN</i>												
3.2.2 (3)P	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the upper limit of yield strength of reinforcement is given in the National Annex:</p> <p><b><math>f_{yk} = 500 \text{ MPa}</math></b></p>												
3.2.7 (2)	<i>Using the default EN</i>												
3.3.4 (5)	<i>Using the default EN</i>												
3.3.6 (7)	<i>Using the default EN</i>												

4.4.1.2 (3)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the values of minimum cover for pre-tensioned tendons are given in the National Annex:</p> <p>for strand or plain wire: <b>2 x diameter</b></p> <p>for indented wire: <b>3 x diameter</b></p>																																																																																																													
4.4.1.2 (5)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Table AN/2 is used:</p> <table border="1" data-bbox="496 577 1409 1037"> <thead> <tr> <th colspan="6">Structural Class</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="5">Exposure class according to Table 4.1</th> </tr> <tr> <th>X0/XC1</th> <th>XC2/XC3</th> <th>XC4</th> <th>XD1/XD2/XD3</th> <th>XS1/XS2/XS3</th> </tr> </thead> <tbody> <tr> <td>Reference Working Life 50 years</td> <td>S4</td> <td>S4</td> <td>S4</td> <td>S4</td> <td>S4</td> </tr> <tr> <td>Design Working Life of 100 years</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> <td>increase class by 2</td> </tr> <tr> <td>Strength Class <math>\geq</math> C40/50</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>no modification</td> <td>no modification</td> </tr> <tr> <td>Adequate cement and life of 100 years</td> <td>no modification</td> <td>reduce class by 1</td> <td>reduce class by 1</td> <td>reduce class by 4</td> <td>reduce class by 4</td> </tr> <tr> <td>Adequate cement and life of 50 years</td> <td>no modification</td> <td>reduce class by 1</td> <td>reduce class by 2</td> <td>reduce class by 3</td> <td>reduce class by 3</td> </tr> </tbody> </table> <p>Table AN/3 is used:</p> <table border="1" data-bbox="496 1120 1409 1420"> <thead> <tr> <th colspan="7">Environmental Requirement for <math>c_{min,dur}</math> [mm]</th> </tr> <tr> <th rowspan="2">Structural Class</th> <th colspan="6">Exposure Class according to Table 4.1</th> </tr> <tr> <th>X0/XC1</th> <th>XC2/XC3</th> <th>XC4</th> <th>XD1/XD2/XD3</th> <th>XS1</th> <th>XS2/XS3</th> </tr> </thead> <tbody> <tr> <td>S1</td> <td>10</td> <td>10</td> <td>15</td> <td>30</td> <td>30</td> <td>30</td> </tr> <tr> <td>S2</td> <td>10</td> <td>10</td> <td>20</td> <td>35</td> <td>35</td> <td>35</td> </tr> <tr> <td>S3</td> <td>15</td> <td>15</td> <td>20</td> <td>40</td> <td>40</td> <td>35</td> </tr> <tr> <td>S4</td> <td>15</td> <td>20</td> <td>25</td> <td>40</td> <td>40</td> <td>35</td> </tr> <tr> <td>S5</td> <td>20</td> <td>25</td> <td>30</td> <td>50</td> <td>50</td> <td>45</td> </tr> <tr> <td>S6</td> <td>25</td> <td>30</td> <td>35</td> <td>60</td> <td>60</td> <td>60</td> </tr> </tbody> </table> <p>Note: Exposure classes with same values are grouped into same column</p> <p>Note: For exposure classes which require special evaluation are used values from the nearest lower exposure class</p> <p>For pre-stressed reinforcement is used concrete cover defined in Table AN/3</p>	Structural Class						Criterion	Exposure class according to Table 4.1					X0/XC1	XC2/XC3	XC4	XD1/XD2/XD3	XS1/XS2/XS3	Reference Working Life 50 years	S4	S4	S4	S4	S4	Design Working Life of 100 years	increase class by 2	increase class by 2	increase class by 2	increase class by 2	increase class by 2	Strength Class $\geq$ C40/50	reduce class by 1	reduce class by 1	reduce class by 1	no modification	no modification	Adequate cement and life of 100 years	no modification	reduce class by 1	reduce class by 1	reduce class by 4	reduce class by 4	Adequate cement and life of 50 years	no modification	reduce class by 1	reduce class by 2	reduce class by 3	reduce class by 3	Environmental Requirement for $c_{min,dur}$ [mm]							Structural Class	Exposure Class according to Table 4.1						X0/XC1	XC2/XC3	XC4	XD1/XD2/XD3	XS1	XS2/XS3	S1	10	10	15	30	30	30	S2	10	10	20	35	35	35	S3	15	15	20	40	40	35	S4	15	20	25	40	40	35	S5	20	25	30	50	50	45	S6	25	30	35	60	60	60
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4.4.1.2 (6)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the value of concrete cover increasing by additive safety element <math>\Delta c_{dur,y}</math> is given in the National Annex:</p> <p>Table AN/4 is used:</p> <table border="1" data-bbox="496 1843 1409 2016"> <thead> <tr> <th colspan="7">Concrete cover increasing by additive safety element <math>\Delta c_{dur,y}</math> [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="6">Exposure Class according to Table 4.1</th> </tr> <tr> <th>X0/XC1</th> <th>XC2/XC3</th> <th>XC4</th> <th>XD1/XD2/XD3</th> <th>XS1</th> <th>XS2/XS3</th> </tr> </thead> <tbody> <tr> <td>Reinforcement with normal cement</td> <td>0</td> <td>0</td> <td>0</td> <td>+5</td> <td>+5</td> <td>0</td> </tr> </tbody> </table>	Concrete cover increasing by additive safety element $\Delta c_{dur,y}$ [mm]							Criterion	Exposure Class according to Table 4.1						X0/XC1	XC2/XC3	XC4	XD1/XD2/XD3	XS1	XS2/XS3	Reinforcement with normal cement	0	0	0	+5	+5	0																																																																																		
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Reinforcement with adequate cement	0	0	0	-5	-5	0																													
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4.4.1.2 (7)	<p>When choosing the <b>“Spanish UNE-EN NA method”</b> the value of concrete cover reduction due using of stainless steel <math>\Delta c_{dur,st}</math> is given in the National Annex:</p> <p>Table AN/5 is used:</p> <table border="1"> <thead> <tr> <th colspan="7">Concrete cover increasing by additive safety element <math>\Delta c_{dur,y}</math> [mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="6">Exposure Class according to Table 4.1</th> </tr> <tr> <th>X0/XC1</th> <th>XC2/XC3</th> <th>XC4</th> <th>XD1/XD2/XD3</th> <th>XS1</th> <th>XS2/XS3</th> </tr> </thead> <tbody> <tr> <td>Normal cement</td> <td>0</td> <td>0</td> <td>0</td> <td>-25</td> <td>-25</td> <td>-25</td> </tr> <tr> <td>Adequate cement</td> <td>0</td> <td>0</td> <td>0</td> <td>-5</td> <td>-5</td> <td>-10</td> </tr> </tbody> </table> <p><i>Note: Exposure classes with same values are grouped into same column</i>  <i>Note: For exposure classes which require special evaluation are used values from the nearest lower exposure class</i></p>	Concrete cover increasing by additive safety element $\Delta c_{dur,y}$ [mm]							Criterion	Exposure Class according to Table 4.1						X0/XC1	XC2/XC3	XC4	XD1/XD2/XD3	XS1	XS2/XS3	Normal cement	0	0	0	-25	-25	-25	Adequate cement	0	0	0	-5	-5	-10
Concrete cover increasing by additive safety element $\Delta c_{dur,y}$ [mm]																																			
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Normal cement	0	0	0	-25	-25	-25																													
Adequate cement	0	0	0	-5	-5	-10																													
4.4.1.2 (8)	<p>When choosing the <b>“Spanish UNE-EN NA method”</b> the value of concrete cover reduction due using of additional protection <math>\Delta c_{dur,add}</math> is given in the National Annex:</p> <p>Table AN/6 is used:</p> <table border="1"> <thead> <tr> <th colspan="7">Concrete cover increasing by additive safety element <math>\Delta c_{dur,add}</math>[mm]</th> </tr> <tr> <th rowspan="2">Criterion</th> <th colspan="6">Exposure Class according to Table 4.1</th> </tr> <tr> <th>X0/XC1</th> <th>XC2/XC3</th> <th>XC4</th> <th>XD1/XD2/XD3</th> <th>XS1</th> <th>XS2/XS3</th> </tr> </thead> <tbody> <tr> <td>Normal cement</td> <td>0</td> <td>0</td> <td>0</td> <td>-25</td> <td>-25</td> <td>-25</td> </tr> <tr> <td>Adequate cement</td> <td>0</td> <td>0</td> <td>0</td> <td>-5</td> <td>-5</td> <td>-10</td> </tr> </tbody> </table> <p><i>Note: Exposure classes with same values are grouped into same column</i>  <i>Note: For exposure classes which require special evaluation are used values from the nearest lower exposure class</i></p>	Concrete cover increasing by additive safety element $\Delta c_{dur,add}$ [mm]							Criterion	Exposure Class according to Table 4.1						X0/XC1	XC2/XC3	XC4	XD1/XD2/XD3	XS1	XS2/XS3	Normal cement	0	0	0	-25	-25	-25	Adequate cement	0	0	0	-5	-5	-10
Concrete cover increasing by additive safety element $\Delta c_{dur,add}$ [mm]																																			
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4.4.1.2 (13)	Using the default EN																																		
4.4.1.3 (1)P	Using the default EN																																		
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4.4.1.3 (4)	Using the default EN																																		
5.2 (5)	Using the default EN																																		
5.5 (4)	Using the default EN																																		



5.8.3.1 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the slenderness criterion where second order effects may be ignored is given in the National Annex:</p> $\lambda_{lim} = 35 \cdot [(C / v) \cdot (1 + 0.24 / (e_2 / h) + 3.4 \cdot (e_1 / e_2 - 1)^2)]^{1/2} \leq 100$ <p>where:</p> <p><math>v = N_{Ed} / (A_c \cdot f_{cd})</math></p> <p><math>e_2</math> ... 1<sup>st</sup> order eccentricity in direction of the higher bending moment (<math>M_y</math> or <math>M_z</math>), considered positive</p> <p><math>e_1</math> ... 1<sup>st</sup> order eccentricity in direction of the lesser bending moment (<math>M_y</math> or <math>M_z</math>), considered positive if bending moment have same sign as bending moment for <math>e_2</math></p> <p><math>h</math> ... dimension of the cross section in vertical direction</p> <p><math>C</math> ... Coefficient based on the arrangements of reinforcement</p> <p><b><math>C = 0.20</math></b></p> <p>other possibilities for <math>C</math> are not implemented</p>
5.10.2.1 (1)P	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the value of factor to calculate the force to the tendon during tensioning is given in the National Annex:</p> <p><b><math>k_1 = 0.70</math></b></p> <p><b><math>k_2 = 0.85</math></b></p>
5.10.2.1 (2)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the value of factor to calculate the maximum stress applied to the tendon during tensioning is given in the National Annex:</p> <p><b><math>k_3 = 0.90</math></b></p>
5.10.2.2 (5)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the value of coefficient for increasing of limit stress in concrete for pretension members is given in the National Annex:</p> <p><b><math>k_6 = 0.60</math></b></p>
5.10.3 (2)	Using the default EN
5.10.9 (1)P	Using the default EN
6.2.2 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the values for calculation of shear resistance of members not requiring design shear reinforcement are given in the National Annex:</p> <p><b><math>c_{Rd,c} = 0.18 / \gamma_c</math></b></p> <p><b><math>v_{min} = 0.075 / \gamma_c \cdot k^{3/2} \cdot f_{ck}^{1/2}</math></b> where <math>f_{ck}</math> is limited to 60 MPa</p> <p><b><math>k_1 = 0.15</math></b></p>

6.2.2 (6)	Using the default EN			
6.2.3 (2)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for non-compressed members is given in the National Annex:</p> <p><math>\theta_{min} = 26.56^\circ</math> (cotg = 2)  <math>\theta_{max} = 63.43^\circ</math> (cotg = 0.5)</p>			
6.2.3 (3)	Using the default EN			
6.2.4 (4)	Using the default EN			
6.2.4 (6)	Using the default EN			
6.4.3 (6)	Using the default EN			
6.4.4 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the values for calculation punching shear resistance of slabs and column bases without shear resistance are given in the National Annex:</p> <p><math>C_{Rd,c} = 0.18 / \gamma_c</math>  <math>V_{min} = 0.075 / \gamma_c \cdot k^{3/2} \cdot f_{ck}^{1/2}</math> where <math>f_{ck}</math> is limited to 60 MPa  <math>k_1 = 0.15</math></p>			
6.4.5 (3)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the limitation for maximum shear resistance is given in the National Annex:</p> <p><math>V_{Rd,max} = 0.5 \cdot v \cdot f_{cd}</math></p>			
6.5.2 (2)	Using the default EN			
6.5.4 (4)	Using the default EN			
7.2 (2)	Using the default EN			
7.2 (3)	Using the default EN			
7.2 (5)	Using the default EN			
7.3.1 (5)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <table border="1" data-bbox="496 1951 1428 2049"> <tr> <td>Exposure class</td> <td>Reinforced members and prestressed members with unbonded tendons</td> <td>Prestressed members with bonded tendons</td> </tr> </table>	Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons
Exposure class	Reinforced members and prestressed members with unbonded tendons	Prestressed members with bonded tendons		

		Frequent load combination	Frequent load combination
	X0	<b>0.4</b>	<b>0.2</b>
	XC1, XC2, XC3, XC4, XF1, XF3	<b>0.3</b>	<b>0.2</b>
	XS1, XS2, XD1, XD2, XD3, XF2, XF4, XA1	<b>0.2</b>	<b>Decompression</b>
	XS3, XA2, XA3	<b>0.1</b>	
7.3.4 (3)	Using the default EN		
8.2 (2)	<p>When choosing the <b>“Spanish UNE-EN NA method”</b> the value of coefficient for calculation minimum clear bar distance and value of minimal clear bar distance are given in the National Annex:</p> <p><b><math>k_1 = 1.0</math></b>  <b><math>k_2 = 0.25 \cdot d_g</math></b></p>		
8.3 (2)	<p>Using the default EN</p> <p>Prestressed reinforcement is not implemented and part of Table AN/10 related to reinforcement steel is same as in default EN.</p>		
9.2.1.1 (1)	<p>When choosing the <b>“Spanish UNE-EN NA method”</b> the minimum reinforcement area of longitudinal reinforcement in beams is given in the National Annex:</p> <p><b><math>A_{s,min} = W / z \cdot f_{ctm,fl} / f_{yd}</math></b></p> <p>where:</p> <p><b>W</b> ... elastic modulus of section related to the most tensioned fibres  <b>z</b> ... inner level arm  <b><math>f_{ctm,fl}</math></b> ... mean flexural tensile strength of concrete  <b><math>f_{yd}</math></b> ... design yield strength of longitudinal reinforcement</p>		
9.2.1.1 (3)	Using the default EN		
9.2.1.2 (1)	Using the default EN		
9.2.2 (5)	<p>When choosing the <b>“Spanish UNE-EN NA method”</b> the formula for calculation minimum ratio of shear reinforcement is given in the National Annex:</p> <p><b><math>\rho_{w,min} = f_{ctm} / (7.5 \cdot f_{yk})</math></b></p>		
9.2.2 (6)	When choosing the <b>“Spanish UNE-EN NA method”</b> the value of maximum spacing between shear assemblies is given in the National Annex:		

	Shear force utilization		$S_{l,max}$
	$V_{Rd} \leq 1/5 \cdot V_{Rd,max}$		$0.75 \cdot d \cdot (1 + \cotg(\alpha_s)) \leq 600 \text{ mm}$
	$1/5 \cdot V_{Rd,max} < V_{Rd} \leq 2/3 \cdot V_{Rd,max}$		$0.60 \cdot d \cdot (1 + \cotg(\alpha_s)) \leq 450 \text{ mm}$
	$V_{Rd} > 2/3 \cdot V_{Rd,max}$		$0.30 \cdot d \cdot (1 + \cotg(\alpha_s)) \leq 300 \text{ mm}$
9.2.2 (8)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the formula for calculation maximum transverse spacing of the legs in series is given in the National Annex:</p> <p><b><math>S_{t,max} = d \leq 500 \text{ mm}</math></b></p>		
9.3.1.1(3)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the formulas for calculation maximum spacing of principal and secondary area of reinforcement for 2D members are given in the National Annex:</p> <p>for principal reinforcement: <b><math>s_{max,slab} = 3.0 \cdot h \leq 300 \text{ mm}</math></b>  for secondary reinforcement: <b><math>s_{max,slab} = 3.5 \cdot h \leq 450 \text{ mm}</math></b></p>		
9.5.2 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the value of minimum diameter of longitudinal reinforcement bar in column is given in the National Annex:</p> <p><b><math>\phi_{min} = 12 \text{ mm}</math></b></p>		
9.5.2 (2)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,min} = \max(0.004 \cdot A_c / f_{yd}; 0.1 \cdot N_{Ed} / f_{yd})</math></b></p>		
9.5.2 (3)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the formula for calculation maximum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,max} = 1 \cdot f_{cd} \cdot A_c / f_{yc,d}</math></b></p> <p>where:  <b><math>f_{yc,d} \dots f_{yd}</math> limited to 400 MPa</b></p>		
9.5.3 (3)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the method for calculation maximum spacing of the transverse reinforcement along the column is given in the National Annex:</p> <p><b><math>s_{cl,tmax} = \min(15 \cdot \phi_l; b_{min}; 300 \text{ mm})</math></b>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars  <b><math>b_{min}</math> is the lesser dimension of the column</b></p>		

9.6.2 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the formula for calculation minimum and maximum area of vertical reinforcement in wall is given in the National Annex:</p> <p>For <math>f_{yk} = 400</math> MPa: <math>A_{s,vmin} = \max(0.0012 \cdot A_c; 0.04 \cdot A_c \cdot f_{cd} / f_{yd})</math>  For <math>f_{yk} = 500</math> MPa: <math>A_{s,vmin} = \max(0.0009 \cdot A_c; 0.04 \cdot A_c \cdot f_{cd} / f_{yd})</math></p> <p><math>A_{s,vmax} = 0.04 \cdot A_c</math></p>
9.6.3 (1)	<p>When choosing the “<b>Spanish UNE-EN NA method</b>” the formula for calculation minimum area of horizontal reinforcement in wall is given in the National Annex:</p> <p>For <math>f_{yk} = 400</math> MPa: <math>A_{s,hmin} = 0.004 \cdot A_c</math>  For <math>f_{yk} = 500</math> MPa: <math>A_{s,hmin} = 0.0032 \cdot A_c</math></p>
9.7 (1)	Using the default EN
12.3.1 (1)	Using the default EN
12.6.3 (2)	Using the default EN

## Sweden

According to Swedish National annex SS EN 1992-1-1:2005/NA:2010-12

Article	Commentary
2.4.2.1 (1)	Using the default EN
2.4.2.2 (1)	Using the default EN
2.4.2.2 (2)	Using the default EN
2.4.2.4 (1)	Using the default EN
3.1.2 (2)P	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the value of maximal concrete strength class is given in the National Annex:</p> <p><math>C_{max} = C100/115</math></p>
3.1.6 (1)P	Using the default EN
3.1.6 (2)P	Using the default EN
3.2.2 (3)P	Using the default EN
3.2.7 (2)	Using the default EN

3.3.4 (5)	<i>Using the default EN</i>																																																																																																			
3.3.6 (7)	<i>Using the default EN</i>																																																																																																			
4.4.1.2 (3)	<i>Using the default EN</i>																																																																																																			
4.4.1.2 (5)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the method for determination of the minimal concrete cover <math>c_{min,dur}</math> is given in the National Annex:</p> <p>Table D1 is used:</p> <table border="1"> <thead> <tr> <th colspan="5"><b>Minimum concrete cover, <math>c_{min,dur}</math> [mm]</b></th> </tr> <tr> <th>Exposure class</th> <th>Max <math>v_{ct,ekv}</math></th> <th>Service life 100 years</th> <th>Service life 50 years</th> <th>Service life 20 years</th> </tr> </thead> <tbody> <tr> <td>X0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td rowspan="2">XC1</td> <td>0.90</td> <td>15</td> <td>10</td> <td>10</td> </tr> <tr> <td>0.60</td> <td>10</td> <td>10</td> <td>10</td> </tr> <tr> <td rowspan="3">XC2</td> <td>0.60</td> <td>25</td> <td>20</td> <td>15</td> </tr> <tr> <td>0.55</td> <td>20</td> <td>15</td> <td>10</td> </tr> <tr> <td>0.50</td> <td>15</td> <td>10</td> <td>10</td> </tr> <tr> <td rowspan="2">XC3, XC4</td> <td>0.55</td> <td>25</td> <td>20</td> <td>15</td> </tr> <tr> <td>0.50</td> <td>20</td> <td>15</td> <td>10</td> </tr> <tr> <td rowspan="2">XS1, XD1</td> <td>0.45</td> <td>30</td> <td>25</td> <td>15</td> </tr> <tr> <td>0.40</td> <td>25</td> <td>20</td> <td>15</td> </tr> <tr> <td rowspan="3">XD2</td> <td>0.45</td> <td>40</td> <td>30</td> <td>25</td> </tr> <tr> <td>0.40</td> <td>35</td> <td>30</td> <td>20</td> </tr> <tr> <td>0.35</td> <td>30</td> <td>25</td> <td>20</td> </tr> <tr> <td rowspan="2">XD3</td> <td>0.40</td> <td>45</td> <td>35</td> <td>25</td> </tr> <tr> <td>0.35</td> <td>40</td> <td>30</td> <td>25</td> </tr> <tr> <td rowspan="3">XS2</td> <td>0.45</td> <td>50</td> <td>40</td> <td>30</td> </tr> <tr> <td>0.40</td> <td>45</td> <td>35</td> <td>25</td> </tr> <tr> <td>0.35</td> <td>40</td> <td>30</td> <td>25</td> </tr> <tr> <td rowspan="2">XS3</td> <td>0.40</td> <td>45</td> <td>35</td> <td>25</td> </tr> <tr> <td>0.35</td> <td>40</td> <td>30</td> <td>25</td> </tr> </tbody> </table> <p><i>Modifications for reinforcing steel with diameter less than 4 mm, for prestressing steel and for cold-formed reinforcing steel with a permanent stress above 400 MPa are not implemented</i></p>	<b>Minimum concrete cover, <math>c_{min,dur}</math> [mm]</b>					Exposure class	Max $v_{ct,ekv}$	Service life 100 years	Service life 50 years	Service life 20 years	X0	-	-	-	-	XC1	0.90	15	10	10	0.60	10	10	10	XC2	0.60	25	20	15	0.55	20	15	10	0.50	15	10	10	XC3, XC4	0.55	25	20	15	0.50	20	15	10	XS1, XD1	0.45	30	25	15	0.40	25	20	15	XD2	0.45	40	30	25	0.40	35	30	20	0.35	30	25	20	XD3	0.40	45	35	25	0.35	40	30	25	XS2	0.45	50	40	30	0.40	45	35	25	0.35	40	30	25	XS3	0.40	45	35	25	0.35	40	30	25
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4.4.1.2 (13)	<i>Using the default EN</i>																																																																																																			
4.4.1.3 (1)P	<i>Using the default EN</i>																																																																																																			
4.4.1.3 (3)	<i>Using the default EN</i>																																																																																																			

4.4.1.3 (4)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the values of minimum cover for concrete cast against prepared ground and concrete cast directly against soil are given in the National Annex:</p> <p><b><math>k_1 = c_{min} + 15 \text{ mm}</math></b>  <b><math>k_2 = c_{min} + 65 \text{ mm}</math></b></p>
5.2 (5)	Using the default EN
5.5 (4)	Using the default EN
5.8.3.1 (1)	Using the default EN
5.10.2.1 (1)P	Using the default EN
5.10.2.1 (2)	Using the default EN
5.10.2.2 (5)	Using the default EN
5.10.3 (2)	Using the default EN
5.10.9 (1)P	Using the default EN
6.2.2 (1)	Using the default EN
6.2.2 (6)	Using the default EN
6.2.3 (2)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the value of minimum angle between the concrete compression strut and the beam axis perpendicular to the shear force for prestressed members is given in the National Annex:</p> <p><b><math>\theta_{min,prestressed} = 18.43^\circ</math> (cotg = 3)</b></p> <p>The values of maximum angle and angles for non-prestressed members are using the default EN</p>
6.2.3 (3)	Using the default EN
6.2.4 (4)	Using the default EN
6.2.4 (6)	Using the default EN
6.4.3 (6)	Using the default EN
6.4.4 (1)	Using the default EN

6.4.5 (3)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the limitation for maximum shear resistance is given in the National Annex:</p> $v_{Rd,max} = \min(0.5 \cdot v \cdot f_{cd}; 1.6 \cdot v_{Rd,c} \cdot u_1 / u_0)$																																																														
6.5.2 (2)	Using the default EN																																																														
6.5.4 (4)	Using the default EN																																																														
7.2 (2)	Using the default EN																																																														
7.2 (3)	Using the default EN																																																														
7.2 (5)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the factors for maximum stress in reinforcement or prestressing steel are given in the National Annex:</p> $k_3 = 1 \text{ mm}$ <p><math>k_4</math> and <math>k_5</math> are using the default EN values</p>																																																														
7.3.1 (5)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p>Table D-2 is used:</p> <table border="1" data-bbox="496 1077 1426 1520"> <thead> <tr> <th colspan="7">Permitted crack width <math>w_{k,max}</math></th> </tr> <tr> <th rowspan="2">Exposure class</th> <th colspan="3">Corrosion sensitivity</th> <th colspan="3">Little corrosion sensitivity</th> </tr> <tr> <th>L100</th> <th>L50</th> <th>L20</th> <th>L100</th> <th>L50</th> <th>L20</th> </tr> </thead> <tbody> <tr> <td>X0</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>XC1</td> <td>0.40</td> <td>0.45</td> <td>-</td> <td>0.45</td> <td>-</td> <td>-</td> </tr> <tr> <td>XC2</td> <td>0.30</td> <td>0.40</td> <td>0.45</td> <td>0.40</td> <td>0.45</td> <td>-</td> </tr> <tr> <td>XC3, XC4</td> <td>0.20</td> <td>0.30</td> <td>0.40</td> <td>0.30</td> <td>0.40</td> <td>-</td> </tr> <tr> <td>XS1, XS2, XD1, XD2</td> <td>0.15</td> <td>0.20</td> <td>0.30</td> <td>0.20</td> <td>0.30</td> <td>0.40</td> </tr> <tr> <td>XS3, XD3</td> <td>0.10</td> <td>0.15</td> <td>0.20</td> <td>0.15</td> <td>0.20</td> <td>0.30</td> </tr> </tbody> </table>	Permitted crack width $w_{k,max}$							Exposure class	Corrosion sensitivity			Little corrosion sensitivity			L100	L50	L20	L100	L50	L20	X0	-	-	-	-	-	-	XC1	0.40	0.45	-	0.45	-	-	XC2	0.30	0.40	0.45	0.40	0.45	-	XC3, XC4	0.20	0.30	0.40	0.30	0.40	-	XS1, XS2, XD1, XD2	0.15	0.20	0.30	0.20	0.30	0.40	XS3, XD3	0.10	0.15	0.20	0.15	0.20	0.30
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XS3, XD3	0.10	0.15	0.20	0.15	0.20	0.30																																																									
7.3.4 (3)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the values of coefficients to calculate maximum final crack spacing are given in the National Annex:</p> $k_3 = 7 \cdot \phi / c$ $k_4 = 0.425$																																																														
8.2 (2)	Using the default EN																																																														
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9.2.1.1 (1)	Using the default EN																																																														



9.2.1.1 (3)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the value of maximum area of longitudinal reinforcement is given in the National Annex:</p> <p><b><math>A_{s,max}</math> is unlimited</b></p>
9.2.1.2 (1)	Using the default EN
9.2.2 (5)	Using the default EN
9.2.2 (6)	Using the default EN
9.2.2 (8)	Using the default EN
9.3.1.1(3)	Using the default EN
9.5.2 (1)	Using the default EN
9.5.2 (2)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the formula for calculation minimum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,min} = 0.002 \cdot A_c</math></b></p>
9.5.2 (3)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the formula for calculation maximum area of longitudinal reinforcement in column is given in the National Annex:</p> <p><b><math>A_{s,max}</math> is unlimited</b></p>
9.5.3 (3)	Using the default EN
9.6.2 (1)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the formula for calculation minimum and maximum area of vertical reinforcement in wall is given in the National Annex:</p> <p><b><math>A_{s,vmin} = 0.002 \cdot A_c</math></b>  <b><math>A_{s,vmax}</math> is unlimited</b></p>
9.6.3 (1)	Using the default EN
9.7 (1)	Using the default EN
12.3.1 (1)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the coefficients taking account of long term effects on the compressive and tensile strength and of unfavourable effects resulting from the way the load is applied for plain concrete are given in the National Annex:</p> <p><b><math>\alpha_{cc,pl} = 1.00</math></b></p>

	$\alpha_{ct,pl} = 0.50$
12.6.3 (2)	<i>Using the default EN</i>

## EN 1992-1-2

### Austria

According to Austrian National annex ÖNORM EN 1992-1-2/NA: 2007-04-01

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

### Belgium

According to Belgian National annex NBN EN 1992-1-2/NA: 2010-08

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<p><i>When choosing the “Belgian NBN-EN NA method” the value of coefficient for calculation of maximal first order eccentricities under fire condition is given in the National Annex:</i></p> <p><math>e_{max} = 0.4 \cdot h</math> (or <math>b</math>)</p>

### United Kingdom

According to British National annex BS EN 1992-1-2/NA: 2005-12

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

### Cyprus

No National Annex currently available, using default EN.

### Czech Republic

According to Czech National annex ČSN EN 1992-1-2/NA: 2007-07  
 ČSN EN 1992-1-2/Opr.1. 2009-10

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

## Denmark

No National Annex currently available, using default EN.

## Netherlands

According to Dutch National annex NEN EN 1992-1-2+C1:2011/NB:2011

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the value of coefficient for calculation of maximal first order eccentricities under fire condition is given in the National Annex:</p> <p>For column width <math>b &lt; 300</math> mm  <math>e_{max} = 0.15 \cdot h</math> (or <math>b</math>)</p> <p>For column width <math>b \geq 300</math> mm  <math>e_{max} = 0.40 \cdot h</math> (or <math>b</math>)</p>

## Finland

According to Finnish National annex SFS EN 1992-1-2/NA

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the value of coefficient for calculation of maximal first order eccentricities under fire condition is given in the National Annex:</p> <p><math>e_{max} = 0.4 \cdot h</math> (or <math>b</math>)</p>

## France

According to French National annex NF EN 1992-1-2/NA:2007-10

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

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## Germany

According to German National annex DIN EN 1992-1-2/NA:2010-12

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

## Greece

According to Greek National annex draft ELOT EN 1492-1-2:2009

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

## Ireland

According to Irish National annex I.S. EN 1992-1-2/NA:2010-01

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

## Italy

No National Annex currently available, using default EN.

## Luxembourg

According to Luxembourgian National annex EN 1992-1-2:2004/AN-LU:2011-09

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<p><i>When choosing the “Luxembourgian LU-EN NA method” the value of coefficient for calculation of maximal first order eccentricities under fire condition is given in the National Annex:</i></p> <p><b><math>e_{max} = 0.4 \cdot h</math> (or <math>b</math>)</b></p>

**Malaysia**

No National Annex currently available, using default EN.

**Norway**

According to Norwegian National annex NS EN 1992-1-2:2004/NA:2010

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

**Poland**

According to Polish National annex PN EN 1992-1-2/NA:2008

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

**Romania**

No National Annex currently available, using default EN.

**Singapore**

No National Annex currently available, using default EN.

**Slovakia**

According to Slovakian National annex STN EN 1992-1-2/NA:2008-08

Article	Commentary
2.3.2 (2)P	<i>Using the default EN</i>
5.3.2 (2)	<i>Using the default EN</i>

**Slovenia**

No National Annex currently available, using default EN.

**Spain**

No National Annex currently available, using default EN.

## Sweden

According to Swedish National annex SS EN 1992-1-2:2004/NA:2009-01

Article	Commentary
2.3.2 (2)P	Using the default EN
5.3.2 (2)	Using the default EN

## EN 1992-2

### Austria

According to Austrian National annex ÖNORM B 1992-2/NA: 2008-08

Article	Commentary																																				
3.1.2 (102)P	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><b><math>f_{ck,min} = 25 \text{ MPa}</math></b>  <b><math>f_{ck,max} = 60 \text{ MPa}</math></b></p>																																				
3.1.6 (101)P	Using the default EN																																				
3.1.6 (102)P	Using the default EN																																				
3.2.4 (101)P	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the reinforcement classes to be used for bridges are given in the National Annex:</p> <p>For non-prestressed reinforcement with adequate ductility:  <b>B+C class</b></p> <p>For massive columns and foundations:  <b>A class</b></p>																																				
5.2 (105)	Using the default EN																																				
5.5 (104)	Using the default EN																																				
7.3.1 (105)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><i>Maximal crack width table [mm]</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>RM (Freq)</th> <th>POST (Freq)</th> <th>POST (Quasi)</th> <th>POST (Char)</th> <th>PRE (Freq)</th> <th>PRE (Quasi)</th> <th>PRE (Char)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.3</td> <td>-</td> <td>0.2</td> <td>-</td> <td>-</td> <td>0.2</td> <td>-</td> <td>-</td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XS1</td> <td>0.3</td> <td>-</td> <td>0.2</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>0.2</td> </tr> <tr> <td>XD2, XS2</td> <td>0.3</td> <td>-</td> <td>-</td> <td>-</td> <td>0.2</td> <td>-</td> <td>-</td> <td>0.2</td> </tr> </tbody> </table>	Exposure class	RM (Quasi)	RM (Freq)	POST (Freq)	POST (Quasi)	POST (Char)	PRE (Freq)	PRE (Quasi)	PRE (Char)	X0, XC1	0.3	-	0.2	-	-	0.2	-	-	XC2, XC3, XC4, XD1, XS1	0.3	-	0.2	-	-	-	-	0.2	XD2, XS2	0.3	-	-	-	0.2	-	-	0.2
Exposure class	RM (Quasi)	RM (Freq)	POST (Freq)	POST (Quasi)	POST (Char)	PRE (Freq)	PRE (Quasi)	PRE (Char)																													
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XD2, XS2	0.3	-	-	-	0.2	-	-	0.2																													

	XD3, XS3	-	0.3	-	-	0.2	-	-	-
<i>Decompression check</i>									
<i>Exposure class</i>	<i>RM (Quasi)</i>	<i>RM (Freq)</i>	<i>POST (Freq)</i>	<i>POST (Quasi)</i>	<i>POST (Char)</i>	<i>PRE (Freq)</i>	<i>PRE (Quasi)</i>	<i>PRE (Char)</i>	
X0, XC1	No	No	No	Yes	No	No	Yes	No	No
XC2, XC3, XC4, XD1, XS1	No	No	No	Yes	No	Yes	No	No	No
XD2, XS2	No	No	Yes	No	No	Yes	No	No	No
XD3, XS3	No	No	Yes	No	No	No	No	No	Yes
<p>where:</p> <p>RM ... reinforced member</p> <p>PM ... prestressed member</p> <p>POST ... member with post-tension tendons</p> <p>Quasi ... under quasi-permanent load combination</p> <p>Char ... under characteristic load combination</p> <p>Freq ... under frequent load combination</p> <p>- in table means – Crack width is not checked in this case</p>									
9.5.3 (101)	<p>When choosing the “<b>Austrian ÖNORM-EN NA method</b>” the minimum diameter of the transverse reinforcement in the column is given in the National Annex:</p> <p><math>\phi_{cl,max} = \min(10 \text{ mm}; 0.25 \cdot \phi_l)</math></p> <p>where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>								
113.3.2 (103)	Using the default EN								

## Belgium

No National Annex currently available, using default EN.

## United Kingdom

According to British National annex BS EN 1992-2/NA: 2007-12

Article	Commentary
3.1.2 (102)P	<p>When choosing the “<b>British BS-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><math>f_{ck,min} = 25 \text{ MPa}</math></p> <p><math>f_{ck,max} = 50 \text{ MPa}</math> for shear strength</p> <p><math>f_{ck,max} = 70 \text{ MPa}</math> for other cases</p>
3.1.6 (101)P	When choosing the “ <b>British BS-EN NA method</b> ” the coefficient taking account of long term effects on the compressive strength and of unfavourable

	<p><i>effects resulting from the way the load is applied is given in the National Annex:</i></p> <p><b><math>\alpha_{cc} = 0.85</math></b> for compression in flexure and axial loading</p> <p><b><math>\alpha_{cc} = 1.0</math></b> for other phenomena</p>
3.1.6 (102)P	<i>Using the default EN</i>
3.2.4 (101)P	<i>Using the default EN</i>
5.2 (105)	<i>Using the default EN</i>
5.5 (104)	<i>Using the default EN</i>
7.3.1 (105)	<i>Using the default EN</i>
9.5.3 (101)	<i>Using the default EN</i>
113.3.2 (103)	<i>Using the default EN</i>

## Cyprus

According to Cypriot National annex CYS EN 1992-2/NA:2010-06

Article	Commentary
3.1.2 (102)P	<i>Using the default EN</i>
3.1.6 (101)P	<i>Using the default EN</i>
3.1.6 (102)P	<i>Using the default EN</i>
3.2.4 (101)P	<i>Using the default EN</i>
5.2 (105)	<i>Using the default EN</i>
5.5 (104)	<i>Using the default EN</i>
7.3.1 (105)	<i>Using the default EN</i>
9.5.3 (101)	<i>Using the default EN</i>
113.3.2 (103)	<i>Using the default EN</i>

## Czech Republic

According to Czech National annex ČSN EN 1992-2/NA:2011-07



ČSN EN 1992-2/Opr.1.2009-10

ČSN EN 1992-2/Z1 2010-03

ČSN EN 1992-2/Z2 2014-01

Article	Commentary																																																
3.1.2 (102)P	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><b><math>f_{ck,min} = 20 \text{ MPa}</math></b>  <b><math>f_{ck,max} = 90 \text{ MPa}</math></b></p>																																																
3.1.6 (101)P	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.90</math></b></p>																																																
3.1.6 (102)P	Using the default EN																																																
3.2.4 (101)P	Using the default EN																																																
5.2 (105)	Using the default EN																																																
5.5 (104)	Using the default EN																																																
7.3.1 (105)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><i>Maximal crack width table [mm]</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PRE (Freq)</th> <th>PRE (Char)</th> <th>POST-PL1 (Freq)</th> <th>POST-PL2+3 (Freq)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.4</td> <td>0.2</td> <td>0</td> <td>0.2</td> <td>0.3</td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XS1</td> <td>0.3</td> <td>0.1</td> <td>0</td> <td>0.2</td> <td>0.3</td> </tr> <tr> <td>XD2, XD3, XS2, XS3</td> <td>0.2</td> <td>-</td> <td>0.2</td> <td>0.1</td> <td>0.2</td> </tr> </tbody> </table> <p><i>Decompression check</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PRE (Freq)</th> <th>PRE (Char)</th> <th>POST-PL1 (Freq)</th> <th>POST-PL2+3 (Freq)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XS1</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> </tr> <tr> <td>XD2, XD3, XS2, XS3</td> <td>No</td> <td>Yes</td> <td>No</td> <td>No</td> <td>No</td> </tr> </tbody> </table> <p>where:  RM ... reinforced member</p>	Exposure class	RM (Quasi)	PRE (Freq)	PRE (Char)	POST-PL1 (Freq)	POST-PL2+3 (Freq)	X0, XC1	0.4	0.2	0	0.2	0.3	XC2, XC3, XC4, XD1, XS1	0.3	0.1	0	0.2	0.3	XD2, XD3, XS2, XS3	0.2	-	0.2	0.1	0.2	Exposure class	RM (Quasi)	PRE (Freq)	PRE (Char)	POST-PL1 (Freq)	POST-PL2+3 (Freq)	X0, XC1	No	No	No	No	No	XC2, XC3, XC4, XD1, XS1	No	No	No	No	No	XD2, XD3, XS2, XS3	No	Yes	No	No	No
Exposure class	RM (Quasi)	PRE (Freq)	PRE (Char)	POST-PL1 (Freq)	POST-PL2+3 (Freq)																																												
X0, XC1	0.4	0.2	0	0.2	0.3																																												
XC2, XC3, XC4, XD1, XS1	0.3	0.1	0	0.2	0.3																																												
XD2, XD3, XS2, XS3	0.2	-	0.2	0.1	0.2																																												
Exposure class	RM (Quasi)	PRE (Freq)	PRE (Char)	POST-PL1 (Freq)	POST-PL2+3 (Freq)																																												
X0, XC1	No	No	No	No	No																																												
XC2, XC3, XC4, XD1, XS1	No	No	No	No	No																																												
XD2, XD3, XS2, XS3	No	Yes	No	No	No																																												

	<p><i>PRE ... member with pre-tension tendons</i></p> <p><i>POST ... member with post-tension tendons</i></p> <p><i>PL ... protection level</i></p> <p><i>Quasi ... under quasi-permanent load combination</i></p> <p><i>Char ... under characteristic load combination</i></p> <p><i>Freq ... under frequent load combination</i></p> <p><i>- in table means – Crack width is not checked in this case</i></p>
9.5.3 (101)	<p>When choosing the “<b>Czech ČSN-EN NA method</b>” the minimum diameter of the transverse reinforcement in the column is given in the National Annex:</p> <p><math>\phi_{cl,max} = \min(8 \text{ mm}; 0.25 \cdot \phi_l)</math></p> <p>where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>
113.3.2 (103)	Using the default EN

## Denmark

No National Annex currently available, using default EN.

## Netherlands

According to Dutch National annex NEN EN 1992-2+C1:2011/NB:2011

Article	Commentary
3.1.2 (102)P	Using the default EN
3.1.6 (101)P	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><math>\alpha_{cc} = 1.0</math></p>
3.1.6 (102)P	Using the default EN
3.2.4 (101)P	Using the default EN
5.2 (105)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the basic value of inclination is given in the National Annex:</p> <p><math>\theta_0 = 1/300</math></p>
5.5 (104)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of coefficients to calculate the distributed moment are given in the National Annex:</p> <p><math>k_1 = f / (500 + f)</math></p>

	$k_2 = 1.0$ $k_3 = 7 \cdot f / (\varepsilon_{cu} \cdot 10^6 + 7 \cdot f)$ $k_4 = 1.0$ $k_5 = 0.7$  $f = [(f_{pk} / \gamma_s - \sigma_{pm,\infty}) \cdot A_p + f_{yd} \cdot A_s] / (A_p + A_s)$																																
7.3.1 (105)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><i>Maximal crack width table [mm]</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.4</td> <td>0.3</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>0.3</td> <td>0.2</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>0.2</td> <td>0.1</td> </tr> </tbody> </table> <p><i>Decompression check</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>No</td> <td>Yes</td> </tr> </tbody> </table> <p>where:  RM ... reinforced member  PM ... prestressed member  Quasi ... under quasi-permanent load combination  Freq ... under frequent load combination</p> <p>Limit decompression stress is calculated by  <math>\Delta\sigma_p \leq k_{dec} \cdot \xi</math></p> <p><i>Coefficients for calculation of limit decompression stress</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th><math>k_{dec}</math> [-]</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>275</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>275</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>75</td> </tr> </tbody> </table>	Exposure class	RM (Quasi)	PM (Freq)	X0, XC1	0.4	0.3	XC2, XC3, XC4	0.3	0.2	XD1, XD2, XD3, XS1, XS2, XS3	0.2	0.1	Exposure class	RM (Quasi)	PM (Freq)	X0, XC1	No	Yes	XC2, XC3, XC4	No	Yes	XD1, XD2, XD3, XS1, XS2, XS3	No	Yes	Exposure class	$k_{dec}$ [-]	X0, XC1	275	XC2, XC3, XC4	275	XD1, XD2, XD3, XS1, XS2, XS3	75
Exposure class	RM (Quasi)	PM (Freq)																															
X0, XC1	0.4	0.3																															
XC2, XC3, XC4	0.3	0.2																															
XD1, XD2, XD3, XS1, XS2, XS3	0.2	0.1																															
Exposure class	RM (Quasi)	PM (Freq)																															
X0, XC1	No	Yes																															
XC2, XC3, XC4	No	Yes																															
XD1, XD2, XD3, XS1, XS2, XS3	No	Yes																															
Exposure class	$k_{dec}$ [-]																																
X0, XC1	275																																
XC2, XC3, XC4	275																																
XD1, XD2, XD3, XS1, XS2, XS3	75																																
9.5.3 (101)	<p>When choosing the “<b>Dutch NEN-EN NA method</b>” the minimum diameter of the transverse reinforcement in the column is given in the National Annex:</p> $\phi_{cl,max} = \min(6 \text{ mm}; 0.25 \cdot \phi_l)$ <p>where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>																																
113.3.2 (103)	Using the default EN																																

## Finland

According to Finnish National annex SFS EN 1992-2/NA:2010-06

Article	Commentary																																
3.1.2 (102)P	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of minimal and characteristics cylinder strength of concrete is given in the National Annex:</p> <p><b><math>f_{ck,min} = 25 \text{ MPa}</math></b></p>																																
3.1.6 (101)P	Using the default EN																																
3.1.6 (102)P	Using the default EN																																
3.2.4 (101)P	Using the default EN																																
5.2 (105)	Using the default EN																																
5.5 (104)	Using the default EN																																
7.3.1 (105)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><i>Maximal crack width table [mm]</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> <th>PM (Quasi)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.3</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XS1</td> <td>0.2</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>XD2, XD3, XS2, XS3</td> <td>0.1</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p><i>Decompression check</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> <th>PM (Quasi)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>No</td> <td>No</td> <td>No</td> </tr> <tr> <td>XC2, XC3, XC4, XD1, XS1</td> <td>No</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>XD2, XD3, XS2, XS3</td> <td>No</td> <td>Yes</td> <td>No</td> </tr> </tbody> </table> <p>where:  RM ... reinforced member  PM ... prestressed member  Quasi ... under quasi-permanent load combination  Freq ... under frequent load combination</p> <p>- in table means – Crack width is not checked in this case</p>	Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)	X0, XC1	0.3	0.2	-	XC2, XC3, XC4, XD1, XS1	0.2	0.2	-	XD2, XD3, XS2, XS3	0.1	-	-	Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)	X0, XC1	No	No	No	XC2, XC3, XC4, XD1, XS1	No	No	Yes	XD2, XD3, XS2, XS3	No	Yes	No
Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)																														
X0, XC1	0.3	0.2	-																														
XC2, XC3, XC4, XD1, XS1	0.2	0.2	-																														
XD2, XD3, XS2, XS3	0.1	-	-																														
Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)																														
X0, XC1	No	No	No																														
XC2, XC3, XC4, XD1, XS1	No	No	Yes																														
XD2, XD3, XS2, XS3	No	Yes	No																														
9.5.3 (101)	<p>When choosing the “<b>Finnish SFS-EN NA method</b>” the minimum diameter of the transverse reinforcement in the column is given in the National Annex:</p> <p><b><math>\phi_{cl,tmax} = \min(8 \text{ mm}; 0.25 \cdot \phi_l)</math></b></p> <p>where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>																																

113.3.2 (103)	Using the default EN
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## France

According to French National annex NF EN 1992-2/NA:2007

Article	Commentary
3.1.2 (102)P	<p>When choosing the “<b>French NF-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><b><math>f_{ck,min} = 20 \text{ MPa}</math></b>  <b><math>f_{ck,max} = 90 \text{ MPa}</math></b></p>
3.1.6 (101)P	<p>When choosing the “<b>French NF-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 1.0</math></b></p>
3.1.6 (102)P	Using the default EN
3.2.4 (101)P	Using the default EN
5.2 (105)	Using the default EN
5.5 (104)	Using the default EN
7.3.1 (105)	Using the default EN
9.5.3 (101)	<p>When choosing the “<b>French NF-EN NA method</b>” the minimum diameter of the transverse reinforcement in the column is given in the National Annex:</p> <p><b><math>\phi_{cl,tmax} = \min(6 \text{ mm}; 0.4 \cdot \phi_l)</math></b>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>
113.3.2 (103)	Using the default EN

## Germany

No National Annex currently available, using default EN.

## Greece

According to Greek National annex draft ELOT EN 1492-2:2009  
draft ELOT EN 1492-2/NA:2009-06

Article	Commentary
3.1.2 (102)P	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><math>f_{ck,min} = 25 \text{ MPa}</math> for non-prestressed concrete  <math>f_{ck,min} = 30 \text{ MPa}</math> for prestressed concrete</p> <p><math>f_{ck,max} = 50 \text{ MPa}</math></p>
3.1.6 (101)P	Using the default EN
3.1.6 (102)P	Using the default EN
3.2.4 (101)P	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the reinforcement classes to be used for bridges are given in the National Annex:</p> <p><b>C class</b></p>
5.2 (105)	Using the default EN
5.5 (104)	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the values of coefficients to calculate the distributed moment are given in the National Annex:</p> <p><math>k_1 = 0.64</math>  <math>k_2 = 0.80</math>  <math>k_3 = 0.64</math>  <math>k_4 = 0.80</math>  <math>k_5 = 0.85</math></p>
7.3.1 (105)	Using the default EN
9.5.3 (101)	<p>When choosing the “<b>Greek ELOT-EN NA method</b>” the minimum diameter of the transverse reinforcement in the column is given in the National Annex:</p> <p><math>\phi_{cl,tmax} = \min(10 \text{ mm}; 0.25 \cdot \phi_l)</math> for <math>\phi_l \leq 28 \text{ mm}</math>  <math>\phi_{cl,tmax} = \min(12 \text{ mm}; 0.25 \cdot \phi_l)</math> for <math>\phi_l &gt; 28 \text{ mm}</math>  where: <math>\phi_l</math> is minimum diameter of the longitudinal bars</p>
113.3.2 (103)	Using the default EN

## Ireland

According to Irish National annex I.S. EN 1992-2:2005  
I.S. EN 1992-2/NA:2010-01

Article	Commentary
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3.1.2 (102)P	<p>When choosing the “<b>Irish IS-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><b><math>f_{ck,min} = 25 \text{ MPa}</math></b></p>																								
3.1.6 (101)P	<p>When choosing the “<b>Irish IS-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b></p>																								
3.1.6 (102)P	Using the default EN																								
3.2.4 (101)P	Using the default EN																								
5.2 (105)	Using the default EN																								
5.5 (104)	Using the default EN																								
7.3.1 (105)	<p>When choosing the “<b>Irish IS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><i>Maximal crack width table [mm]</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.25</td> <td>-</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>0.25</td> <td>-</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>0.1</td> <td>-</td> </tr> </tbody> </table> <p><i>Decompression check</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>No</td> <td>Yes</td> </tr> </tbody> </table> <p>where:</p> <p>RM ... reinforced member  PM ... prestressed member  Quasi ... under quasi-permanent load combination  Freq ... under frequent load combination</p> <p>- in table means – Crack width is not checked in this case</p>	Exposure class	RM (Quasi)	PM (Freq)	X0, XC1	0.25	-	XC2, XC3, XC4	0.25	-	XD1, XD2, XD3, XS1, XS2, XS3	0.1	-	Exposure class	RM (Quasi)	PM (Freq)	X0, XC1	No	Yes	XC2, XC3, XC4	No	Yes	XD1, XD2, XD3, XS1, XS2, XS3	No	Yes
Exposure class	RM (Quasi)	PM (Freq)																							
X0, XC1	0.25	-																							
XC2, XC3, XC4	0.25	-																							
XD1, XD2, XD3, XS1, XS2, XS3	0.1	-																							
Exposure class	RM (Quasi)	PM (Freq)																							
X0, XC1	No	Yes																							
XC2, XC3, XC4	No	Yes																							
XD1, XD2, XD3, XS1, XS2, XS3	No	Yes																							
9.5.3 (101)	Using the default EN																								
113.3.2 (103)	Using the default EN																								

## Italy

No National Annex currently available, using default EN.

## Luxembourg

According to Luxembourgian National annex LU EN 1992-2:2005/AN-LU:2011-09

Article	Commentary																																				
3.1.2 (102)P	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><b><math>f_{ck,max} = 90 \text{ MPa}</math></b></p>																																				
3.1.6 (101)P	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 0.85</math></b> for simple and composed bending  <b><math>\alpha_{cc} = 1.0</math></b> for other phenomena</p>																																				
3.1.6 (102)P	Using the default EN																																				
3.2.4 (101)P	Using the default EN																																				
5.2 (105)	Using the default EN																																				
5.5 (104)	Using the default EN																																				
7.3.1 (105)	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><b>Maximal crack width table [mm]</b></p> <table border="1"> <thead> <tr> <th>Structure</th> <th>RM</th> <th>PM</th> </tr> </thead> <tbody> <tr> <td>Road superstructure</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>Railway superstructure</td> <td>0.3</td> <td>-</td> </tr> <tr> <td>Other superstructure</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>Piles and columns</td> <td>0.3</td> <td>0.2</td> </tr> <tr> <td>Earth retaining structure</td> <td>0.2</td> <td>0.2</td> </tr> <tr> <td>Anchorage reactions</td> <td>0.3</td> <td>-</td> </tr> </tbody> </table> <p><b>Decompression check</b></p> <table border="1"> <thead> <tr> <th>Structure</th> <th>RM</th> <th>PM</th> </tr> </thead> <tbody> <tr> <td>Road superstructure</td> <td>No</td> <td>No</td> </tr> <tr> <td>Railway superstructure</td> <td>No</td> <td>No</td> </tr> <tr> <td>Other superstructure</td> <td>No</td> <td>No</td> </tr> <tr> <td>Piles and columns</td> <td>No</td> <td>Yes</td> </tr> </tbody> </table>	Structure	RM	PM	Road superstructure	0.2	-	Railway superstructure	0.3	-	Other superstructure	0.2	-	Piles and columns	0.3	0.2	Earth retaining structure	0.2	0.2	Anchorage reactions	0.3	-	Structure	RM	PM	Road superstructure	No	No	Railway superstructure	No	No	Other superstructure	No	No	Piles and columns	No	Yes
Structure	RM	PM																																			
Road superstructure	0.2	-																																			
Railway superstructure	0.3	-																																			
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	<table border="1"> <tr> <td><i>Earth retaining structure</i></td> <td>No</td> <td>Yes</td> </tr> <tr> <td><i>Anchorage reactions</i></td> <td>No</td> <td>No</td> </tr> </table> <p>where:  <i>RM ... reinforced member</i>  <i>PM ... prestressed member</i></p> <p>- in table means – Crack width is not checked in this case</p>	<i>Earth retaining structure</i>	No	Yes	<i>Anchorage reactions</i>	No	No
<i>Earth retaining structure</i>	No	Yes					
<i>Anchorage reactions</i>	No	No					
9.5.3 (101)	<i>Using the default EN</i>						
113.3.2 (103)	<p>When choosing the “<b>Luxembourgian LU-EN NA method</b>” the factor for maximum tensile stress during execution for quasi-permanent combination is given in the National Annex:</p> <p><b><math>k = 0.7</math></b></p>						

## Malaysia

No National Annex currently available, using default EN.

## Norway

No National Annex currently available, using default EN.

## Poland

According to Polish National annex PN EN 1992-2/NA:2010-03

Article	Commentary
3.1.2 (102)P	<i>Using the default EN</i>
3.1.6 (101)P	<i>Using the default EN</i>
3.1.6 (102)P	<i>Using the default EN</i>
3.2.4 (101)P	<i>Using the default EN</i>
5.2 (105)	<i>Using the default EN</i>
5.5 (104)	<i>Using the default EN</i>
7.3.1 (105)	<i>Using the default EN</i>
9.5.3 (101)	<i>Using the default EN</i>
113.3.2 (103)	<i>Using the default EN</i>

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## Romania

No National Annex currently available, using default EN.

## Singapore

No National Annex currently available, using default EN.

## Slovakia

According to Slovakian National annex STN EN 1992-2/NA:2008-07

Article	Commentary																																
3.1.2 (102)P	<i>Using the default EN</i>																																
3.1.6 (101)P	<i>Using the default EN</i>																																
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7.3.1 (105)	<p>When choosing the “<b>Slovakian STN-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><i>Maximal crack width table [mm]</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> <th>PM (Quasi)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.3</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>0.3</td> <td>0.2</td> <td>-</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>0.3</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p><i>Decompression check</i></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM (Quasi)</th> <th>PM (Freq)</th> <th>PM (Quasi)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>No</td> <td>No</td> <td>No</td> </tr> <tr> <td>XC2, XC3, XC4</td> <td>No</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>XD1, XD2, XD3, XS1, XS2, XS3</td> <td>No</td> <td>Yes</td> <td>No</td> </tr> </tbody> </table> <p>where:  RM ... reinforced member  PM ... prestressed member  Quasi ... under quasi-permanent load combination  Freq ... under frequent load combination</p>	Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)	X0, XC1	0.3	0.2	-	XC2, XC3, XC4	0.3	0.2	-	XD1, XD2, XD3, XS1, XS2, XS3	0.3	-	-	Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)	X0, XC1	No	No	No	XC2, XC3, XC4	No	No	Yes	XD1, XD2, XD3, XS1, XS2, XS3	No	Yes	No
Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)																														
X0, XC1	0.3	0.2	-																														
XC2, XC3, XC4	0.3	0.2	-																														
XD1, XD2, XD3, XS1, XS2, XS3	0.3	-	-																														
Exposure class	RM (Quasi)	PM (Freq)	PM (Quasi)																														
X0, XC1	No	No	No																														
XC2, XC3, XC4	No	No	Yes																														
XD1, XD2, XD3, XS1, XS2, XS3	No	Yes	No																														

	- in table means – Crack width is not checked in this case
9.5.3 (101)	Using the default EN
113.3.2 (103)	Using the default EN

## Slovenia

No National Annex currently available, using default EN.

## Spain

No National Annex currently available, using default EN.

## Sweden

According to Swedish National annex SS EN 1992-2:2005/NA:2008-12

Article	Commentary																														
3.1.2 (102)P	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the values of minimal and maximal characteristics cylinder strengths of concrete are given in the National Annex:</p> <p><b><math>f_{ck,min} = 25 \text{ MPa}</math></b>  <b><math>f_{ck,max} = 100 \text{ MPa}</math></b></p>																														
3.1.6 (101)P	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the coefficient taking account of long term effects on the compressive strength and of unfavourable effects resulting from the way the load is applied is given in the National Annex:</p> <p><b><math>\alpha_{cc} = 1.0</math></b></p>																														
3.1.6 (102)P	Using the default EN																														
3.2.4 (101)P	Using the default EN																														
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7.3.1 (105)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the values of maximal calculated crack width are given in the National Annex:</p> <p><b>Maximal crack width table [mm]</b></p> <table border="1"> <thead> <tr> <th>Exposure class</th> <th>RM – L100 (Quasi)</th> <th>RM – L50 (Quasi)</th> <th>RM – L20 (Quasi)</th> <th>PM – L100 (Freq)</th> <th>PM – L50 (Freq)</th> <th>PM – L20 (Freq)</th> <th>PM – L100 (Quasi)</th> <th>PM – L50 (Quasi)</th> <th>PM – L20 (Quasi)</th> </tr> </thead> <tbody> <tr> <td>X0, XC1</td> <td>0.45</td> <td>0.45</td> <td>0.45</td> <td>0.4</td> <td>0.45</td> <td>0</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>XC2,</td> <td>0.4</td> <td>0.45</td> <td>-</td> <td>0.3</td> <td>0.4</td> <td>0.45</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Exposure class	RM – L100 (Quasi)	RM – L50 (Quasi)	RM – L20 (Quasi)	PM – L100 (Freq)	PM – L50 (Freq)	PM – L20 (Freq)	PM – L100 (Quasi)	PM – L50 (Quasi)	PM – L20 (Quasi)	X0, XC1	0.45	0.45	0.45	0.4	0.45	0	-	-	-	XC2,	0.4	0.45	-	0.3	0.4	0.45	-	-	-
Exposure class	RM – L100 (Quasi)	RM – L50 (Quasi)	RM – L20 (Quasi)	PM – L100 (Freq)	PM – L50 (Freq)	PM – L20 (Freq)	PM – L100 (Quasi)	PM – L50 (Quasi)	PM – L20 (Quasi)																						
X0, XC1	0.45	0.45	0.45	0.4	0.45	0	-	-	-																						
XC2,	0.4	0.45	-	0.3	0.4	0.45	-	-	-																						

	XC3, XC4	0.3	0.4	-	0.2	0.3	0.4	-	-	-
	XS1, XS2, XD1, XD2	0.2	0.3	0.4	-	-	-	-	-	-
	XS3, XD3	0.15	0.2	0.3	-	-	-	-	-	-
<i>Decompression check</i>										
	<i>Exposure class</i>	<i>RM – L100 (Quasi)</i>	<i>RM – L50 (Quasi)</i>	<i>RM – L20 (Quasi)</i>	<i>PM – L100 (Freq)</i>	<i>PM – L50 (Freq)</i>	<i>PM – L20 (Freq)</i>	<i>PM – L100 (Quasi)</i>	<i>PM – L50 (Quasi)</i>	<i>PM – L20 (Quasi)</i>
	X0, XC1	No	No	No	No	No	No	No	No	No
	XC2,	No	No	No	No	No	No	Yes	Yes	Yes
	XC3, XC4	No	No	No	No	No	No	Yes	Yes	Yes
	XS1, XS2, XD1, XD2	No	No	No	Yes	Yes	Yes	No	No	No
	XS3, XD3	No	No	No	Yes	Yes	Yes	No	No	No
<p>where:</p> <p>RM ... reinforced member</p> <p>PM ... prestressed member</p> <p>Quasi ... under quasi-permanent load combination</p> <p>Char ... under characteristic load combination</p> <p>Freq ... under frequent load combination</p> <p>L100 ... service life at least 100 years</p> <p>L50 ... service life at least 50 years</p> <p>L20 ... service life at least 20 years</p> <p>- in table means – Crack width is not checked in this case</p>										
9.5.3 (101)	Using the default EN									
113.3.2 (103)	<p>When choosing the “<b>Swedish SS-EN NA method</b>” the factor for maximum tensile stress during execution for quasi-permanent combination is given in the National Annex:</p> <p><b><math>k = 0.5</math></b></p>									

