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Reliability of structural members designed with the Eurocodes NDPs selected by EU and EFTA Member States

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Foreword

The construction sector is of strategic importance to the European Union (EU) as it delivers the buildings and infrastructure needed by the rest of the economy and society. It represents more than 10% of EU GDP and more than 50% of fixed capital formation. It is the largest single economic activity and it is the biggest industrial employer in Europe. The sector employs directly almost 20 million people. Construction is a key element not only for the implementation of the Single Market, but also for other relevant EU Strategies, e.g. Sustainability, Environment and Energy, since 40-45% of Europe's energy consumption stems from buildings with a further 5-10% being used in processing and transport of construction products and components.

The publication of the Eurocodes, by the European Committee for Standardization (CEN) in May 2007, marked a major milestone in the European standardization for construction, since the EN Eurocodes are a set of European standards (Européenne Normes), which provide common rules for the design of construction works to check their strength, stability and fire resistance. The on-going implementation of Eurocodes in the Member States of the European Union and of the European Free Trade Association (EFTA) does enhance the functioning of the Internal Market for construction products and services by removing the obstacles arising from different national practices.

The next goal of the European Union is to keep the Eurocodes as the most advanced state-of-the-art codes for structural design in the world. In December 2012, the Directorate General Internal Market, Industry, Entrepreneurship, and Small and Medium Enterprises (DG GROW) issued the Mandate M/515 EN for a detailed work programme to develop the second generation of structural Eurocodes, which includes amending the existing Eurocodes and extending their scope.

Since March 2005, the Joint Research Centre of the European Commission (JRC) provides scientific and technical support to DG GROW in the frame of Administrative Arrangements on the Eurocodes. The mission initially devoted to the JRC included support to the national implementation and harmonization of the Eurocodes, support to the training, international promotion and further development of the Eurocodes. Since 2015, the scope of the JRC contribution has been extended to support to policies and standards for sustainable construction.

One of the tasks allocated to the JRC is the development and maintenance of a Database with the Nationally Determined Parameters (NDPs Database) adopted in the countries of EU and EFTA applying the EN Eurocodes. The NDPs Database acts as a platform of notification to the European Commission by the Member States on the adopted values of the NDPs and constitutes the basis for the analysis of the NDPs, contributing to the definition of strategies tending to achieve further harmonization of the Eurocodes.

This JRC Technical Report aims at evaluating the reliability levels of design reached with the NDP values recommended by CEN and with the current NDP values selected by Member States. The obtained results for selected structural members serve as a basis to support further work on the calibration of the CEN recommended values in the second generation of the Eurocodes.

The editors and authors have sought to present useful and consistent information in this report. However, users of information contained in this report must satisfy themselves of its suitability for the purpose for which they intend to use it.

The report is available to download from the "Eurocodes: Building the future" website (http://eurocodes.jrc.ec.europa.eu).

Ispra, July 2018

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Abstract

Reliability is defined in the Eurocodes as the ***"ability of a structure or a structural member to fulfil the specified requirements, including the design working life, for which it has been designed"***. The reliability levels are expressed by reliability indices, which are defined by probabilistic analysis considering the uncertainties in the actions and material properties, and the uncertainties in the modelling of action effects and structural resistance. The **Eurocodes recommend reliability indices** for three reliability classes which are associated to the consequences of failure or malfunction of the structure.

The study is developed under Administrative Arrangements between DG GROW and the JRC. The analysis of the reliability levels achieved with the Nationally Determined Parameters (NDPs) chosen by the EU/EFTA Member States (MS) allows to **cluster the national choices related to the design of particular type of structures** and to compare **their joint impact on the level of safety achieved**.

The reliability analysis is performed for selected **basic structural members**, namely a beam, a column, a slab, a tie and a wall, **considering different materials**, *i.e.*, concrete, composite steel concrete, steel, timber and masonry. The imposed loads considered in the analysis correspond to commonly used categories of loaded areas A to D in buildings, as specified in EN 1991-1-1. Typical buildings whose prevailing type of area corresponds to these categories of loaded areas are: **residential buildings and houses** (category A); **office buildings** (category B); **schools** (category C1); **churches, theatres, cinemas** (category C2); **museums, exhibition centres** (category C3); **sports facilities** (category C4); **concert halls, sports halls** (category C5); **retails shops** (category D1); **department stores** (category D2).

The **reliability level of structural members** in buildings designed according to the **Eurocodes** was **assessed for 20 EU and EFTA MS** using the **NDPs uploaded** in the European Commission NDPs Database by the end of 2017 by 16 EU MS and consulting the National Annexes of four other EU and EFTA MS.

The main conclusions of the study are the following:

- the reliability of structural members which were designed according to the national choice of the NDPs varies in a rather broad range. The **reliability levels of the structural members for most common categories of imposed loads match the reliability indices recommended** in EN 1990.
- **in some cases** the **reliability levels** according to the **country choices** of the NDPs are below the CEN target values and therefore **should be further analysed and calibrated**. **Special attention should be given to country choices related to composite members**, for the categories of imposed loads C2 and C5, **to steel members** for the category C5, and **to timber structural members** for the categories C2, C4 and C5, especially for fundamental combination of actions defined with the twin expressions (6.10a, 6.10b) of EN 1990.
- the reliability levels achieved using CEN recommended values should also be studied further, in order to delineate eventual **needs for calibration of the recommended values**, especially when expressions 6.10a & 6.10b of EN 1990 are used for the fundamental combination of actions.
- the reliability levels of composite, steel and timber members designed according to the **lower bound of imposed loads recommended in EN 1991-1-1**, are commonly lower than the reliability levels recommended in EN 1990, when expressions 6.10 & 6.10b, and expressions $6.10a_{mod}$ & 6.10b of EN 1990 are used for the fundamental combination of actions. **The rather broad interval of values of imposed loads** for categories A to D presently recommended in the Eurocodes, should be further analysed by CEN and **narrowed down**.

The reliability indices calculated in the present study for the typical load ratio $\chi = 0.4$ vary from 2.9 to 6.8, the former value was obtained by Latvia for the composite steel concrete

slab for category of use C2 and for the *combination procedure b* and the latter value was obtained by the United Kingdom for the masonry wall for category of use C4 and for the *combination procedure a*. It should be noted, that the **reliability of whole structure is normally higher than the one of a structural member**. Thus, the presented results show that a **generally good level** of structural reliability has been **achieved with the country choices of the NDPs.**

1 Introduction

This report aims to present the reliability levels of structural members designed according to the partial factor method given in the Eurocodes, using the Nationally Determined Parameters (NDPs) uploaded in the European Commission Database by the Member States (MS) of the European Union (EU) and of the European Free Trade Association (EFTA). The Eurocodes Database for Nationally Determined Parameters, herein called the "NDPs Database", has restricted access to the interested Commission Services, CEN/TC 250 Coordination Group and its 10 Sub Committees, the interested National Authorities and the National Standardization Bodies of the EU and EFTA Member States, and is administrated by the Joint Research Centre (JRC). The report includes the description of the underlying methodology to evaluate the reliability levels, the presentation of the used data, the analysis of reliability levels for selected structural members, and the presentation of conclusions and recommendations.

It should be noted, that the recommended by CEN values for the reliability index are targeting primarily whole buildings, whose reliability is normally higher than the one of a structural member.

The report also incorporates results achieved since 2015 [1] and uses a software package previously developed in Mathcad 15.0 for the purpose of the reliability analyses [2]. The software package uses the values of partial factors for actions and material properties, and the values of reduction factors nationally adopted by the countries that were available in the NDPs Database in the last quarter of 2017. The alternative fundamental combinations of actions given in EN 1990 for the verification of the Ultimate Limit States (ULS) are taken into account.

The reliability analysis is made for selected basic structural members, namely a beam, a column, a slab, a tie, and a wall, considering different materials, *i.e.*, reinforced concrete, steel, composite steel concrete, timber and masonry.

The structural members were designed by the partial factor method, which is the basic method for structural design in the Eurocodes, using the NDPs values available in the JRC NDPs Database or given in the National Annexes of several CEN Member States. An economic design of a structural member is considered assuming that the design value of the effect of actions, E_d, is equal to the design value of the corresponding resistance, R_d. The reliability level of the structural members is then verified by probabilistic methods.

The current report is organized as follows:

— Chapter 2 gives a procedure which was applied for analyses of reliability levels of structural members.

— Chapter 3 provides information on the NDP values used in the reliability analysis, focusing on the Recommended Values (RVs) in the Eurocodes and on the national selection of the values of NDPs by the Member States.

— Chapter 4 presents the reliability indices β of selected structural members, addressing the following conditions:

  - for steel members, typical values of load ratios χ (the ratio of the variable actions to the total load) equal to 0.3 and 0.4 (see section 4.2) are considered;
  - for reinforced concrete members, the analysis of sensitivity of the variation of the concrete strength on the reliability indices is made (see section 4.3);
  - for nine different structural members and five basic materials, the minimum and maximum reliability indices for the NDPs Recommended Values and country selected values are evaluated along an interval of typical possible values of the load ratio χ (see section 4.4). The reliability levels for a typical value of load ratio χ = 0.4 is calculated.

— Chapter 5 presents the reliability indices β taking into consideration the national selection of the reduction factors ψ_0 needed for combinations of imposed loads.

— Chapter 6 provides diagrams illustrating reliability levels of selected structural members designed according to the NDPs Recommended Values (RV) by CEN/TC 250, for the complete range of the load ratio χ, considering the upper and lower bounds of the characteristic values of imposed values provided in EN 1991-1-1.

— Chapter 7 summarizes the results obtained, presents the concluding remarks of the report and addresses the way ahead.

— Finally, Annex A presents, in percentage terms, the reliability indices obtained for a typical load ratio value equal to 0.4 and Annex B shows the load ratios for which the reliability indices achieved the minimum and the maximum values.

2 Methodology for reliability analyses

2.1 Design of structural members according to the partial factor method

ULS (type STR) of internal failure or excessive deformation of the structure or structural members, where the strength of construction materials of the structure governs, are considered in the reliability analysis. For verifications of structural members, alternative procedures for the fundamental combination of actions in permanent and transient design situations are provided in Eurocode EN 1990 for basis of structural design, namely the expression (6.10), the twin expressions (6.10a and 6.10b) or the modified twin expressions where in the first expression (6.10a) only the permanent actions are applied, denoted here as (6.10a$_{mod}$).

Considering one permanent action G and two variable actions Q and F, the load combination given in EN 1990 by expression (6.10), denoted here as procedure a, for the specification of the design value of action effect E_d is given as:

$$\gamma_G G_k \text{ "+" } \gamma_Q Q_k \text{ "+" } \gamma_F \psi_{0,F} F_k \qquad \text{(EN 1990, } \textbf{exp. 6.10}\text{) (1)}$$

where:
"+" implies "to be combined with",
G_k, Q_k and F_k are the characteristic values of actions G, Q and F,
γ_G, γ_Q and γ_F denote the partial factors of actions G, Q and F,
$\psi_{0,F}$ is the combination factor for the action F.

An alternative procedure (denoted as *procedure b* for combination of actions is provided in EN 1990 by the twin expressions (6.10a) and (6.10b), given as:

$$\gamma_G G_k \text{ "+" } \gamma_Q \psi_{0,Q} Q_k \text{ "+" } \gamma_F \psi_{0,F} F_k \qquad \text{(EN 1990, } \textbf{exp. 6.10a}\text{) (2)}$$

$$\xi \gamma_G G_k \text{ "+" } \gamma_Q Q_k \text{ "+" } \gamma_F \psi_{0,F} F_k \qquad \text{(EN 1990, } \textbf{exp. 6.10b}\text{) (3)}$$

where:

the less favourable action effect from (2) and (3) should be considered,
$\psi_{0,Q}$ is the combination factor for the variable load Q,
ξ is the reduction factor for the permanent load G.

In addition, in EN 1990, the NDP in A1.3.1(1), Table A1.2(B), allows to further modify the alternative *procedure b*, twin expressions (6.10a, 6.10b), simplifying equation (2) by considering permanent loads only in the first expression (6.10a). This alternative is denoted here as *procedure c*, thus the load effect in the first expression (6.10a) is given as:

$$\gamma_G G_k \qquad (\textbf{6.10a}_{\textbf{mod}}) \text{ (4)}$$

and the less favourable action effect resulting from (3) and (4) is then considered.

If the leading action is a variable action F, then in equations (1) and (3) instead of reducing the action F by the factor $\psi_{0,F}$, the load Q should be reduced by appropriate factor $\psi_{0,Q}$. à

To study the resulting load effects under various intensities of variable actions, the characteristic values of actions G_k, Q_k and F_k are related using the quantity χ given as the ratio of the variable actions Q_k+F_k to the total load $G_k+Q_k+F_k$, and the ratio k of accompanying action F_k to the main action Q_k as:

$$\chi = (Q_k+F_k)/(G_k+Q_k+F_k),\ k = F_k/Q_k \qquad (5)$$

The values of χ may be commonly expected within a range from 0 to 0.6 for common buildings, however sometimes they are approaching to 1, e.g. in case of snow loads on light-weight steel roofs of industrial halls [3].

For a given design value of the load effect E_d, the characteristic values of the individual actions G_k, Q_k, F_k can be expressed using variables χ and k defined by equation (5). For example the expression for G_k becomes:

$$G_k = \frac{E_d}{(\xi)\gamma_G + \frac{((\psi_{0,Q})\gamma_Q + k(\psi_{0,F})\gamma_F)\chi}{(1+k)(1-\chi)}} \tag{6}$$

The reliability elements ξ, γ and ψ indicated in brackets in relationship (6) are applied in the same way (either used or not) as specified in equations (1), (2) and (3) for appropriate combination rules and the leading action.

The analyses presented in chapters 4 and 6 consider only the presence of permanent and imposed loads. In case that one imposed load is considered only then the load ratio $k = 0$ and expression (6) becomes:

$$G_k = \frac{E_d}{(\xi)\gamma_G + \frac{\psi_{0,Q}\,\gamma_Q\,\chi}{1-\chi}} \tag{7}$$

This assumption has been introduced to make the comparison of the reliability levels achieved by different EU and EFTA countries independent from their climatic conditions and from the chosen approaches for definition of the climatic actions.

Chapter 5 presents the reliability levels obtained with the combination of two different imposed loads in order to analyse the influence of the combination factor ψ_0 different from the CEN recommended value.

2.2 Structural members and categories of imposed loads selected in EN 1991-1-1

The reliability analysis is performed for selected basic structural members, namely a slab, a beam, a tie, a column and a wall, considering different materials, as follows:

— reinforced concrete beam, column and slab;

— composite steel concrete slab;

— steel tie and column;

— timber beam and column;

— masonry wall.

Several categories of imposed loads A to H are given in EN 1991-1-1 from which in the presented analysis are considered commonly used categories A to D described in Clause 6.3.1.1(1), Table 6.1.

Table 1 presents examples of buildings with prevailing areas of categories A to D. This association gives the possibility to interpret the results of the reliability analyses of structural members considering imposed loads corresponding to these areas, in the context of typical categories of buildings.

Table 1 - Examples of buildings with prevailing areas of categories A to D

Category of use of area	Example of buildings with prevailing areas of this category
A	residential buildings and houses
B	office buildings
C1	schools
C2	churches, theatres, cinemas
C3	museums, exhibition centres
C4	sports facilities
C5	concert halls, sports halls
D1	retails shops
D2	department stores

2.3 Probabilistic reliability analysis

EN 1990 allows a design or verification of structures based directly on the probabilistic methods. In accordance with the principles of these methods the basic variables are considered as random variables with appropriate probabilistic distributions. It is verified whether a limit state of a structural member is exceeded with a probability lower than the target value given as:

$$P_f = \mathrm{P}(g(\boldsymbol{X}) < 0) < p_t \tag{8}$$

where:

$g(\boldsymbol{X})$ is the limit state function, for which the inequality $g(\boldsymbol{X}) < 0$ indicates that the limit state is exceeded,
P_f is the probability of failure and
p_t is the target value of the probability of failure.

The condition (8) may be replaced by the inequality $\beta > \beta_t$, where β is the reliability index and β_t is the target reliability index.

EN 1990 recommends the target probability $p_t = 7.24 \times 10^{-5}$ for the ULS corresponding to the target reliability index $\beta_t = 3.8$ for a 50 years reference period and common types of structures in the consequence class CC2. Following the expression (C.1) of EN 1990, the reliability index β is related to the probability of failure P_f as

$$\beta = -\Phi^{-1}(P_f) \tag{9}$$

where:

Φ is the cumulative distribution function of the standardized Normal distribution.

The probabilistic reliability analysis is based on the limit state function $g(X)$ corresponding to the load effect given, for instance, by equation (1) and to the resistance R of a structural member:

$$g(\boldsymbol{X}) = \theta_R R - \theta_E (G + Q + F) \tag{10}$$

where:

X is the vector of basic variables (random variables entering the right hand side of this equation),
θ_R is the factor expressing the uncertainty of the resistance model,
θ_E is the factor expressing the uncertainty of the action effect model.

An important step in reliability analysis is the specification of probabilistic models for the basic variables. The limit state function, equation (10), has six basic variables that describe the actions *G*, *Q* and *F*, the resistance *R* and the model uncertainties θ_R and θ_E.

The selection of probabilistic models used in the reliability analysis in this report is based on the JCSS Probabilistic Model Code (PMC) [4], on other documents [5 to 14] and on previous research of the Klokner Institute CTU. An overview of probabilistic models for imposed loads for categories of areas A to D according to PMC [4] and other documents [5 to 14] is given in Table 2.

Table 3 provides the probabilistic models of basic variables which were used for time-invariant reliability analyses of structural members. This table includes three fundamental categories of basic variables (actions, material strengths and geometric data) supplemented by model uncertainties for action effects and structural resistance.

The permanent actions are here described by Normal distributions (N). It is not considered here that self-weight of structural members could have lower variability than other permanent actions. Imposed loads of categories A to D in buildings as given in EN 1991-1-1 (two reference periods are given for imposed loads of categories A and B) are described by Gumbel distribution (GUM) and the material strength by Lognormal distribution (LN). For the purpose of comparative studies, the mean values μ_X of all the variables *X* are related to the characteristic values X_k used in the design calculation by the expressions given in Table 3.

The models applied are intended as "conventional models" in time invariant reliability analysis of structural members using Turkstra's combination rule, as described in the PMC [4], Holicky [3], and Markova & Holicky [15].

Further information on probabilistic analyses including probabilistic models can be found in the PMC [4, 12, 13, 14, 16].

Table 2 - Survey of probabilistic models for imposed loads based on PMC [4] and selected documents [5, 6, 7, 8, 9]

Category (JCSS)	Sustained load q					Intermittent load p									Reference, note
	A_0	μ_q	σ_V	σ_U	$1/\kappa_{ren}$	μ_p	σ_U	$1/\kappa_{ren}$	durat.	A_{load}	X_k	μ_{50}/X_k	V_{50}	$P(X<X_k)$*	
	m^2	kN/m^2	kN/m^2	kN/m^2	year	kN/m^2	kN/m^2	year	days	m^2	kN/m^2	-	-	%	
Residence	20	0.3	0.15	0.3	7	0.3	0.4	1	1–3	30	1.75	0.52	0.57	99.0	PMC [4]
Office	20	0.5	0.3	0.6	5	0.2	0.4	0.3	1–3	100	2.5	0.57	0.41	99.4	PMC [4]
School classroom	100	0.6	0.15	0.4	10	0.5	1.4	0.3	1–5	100	2.5	0.54	0.52	98.6	PMC [4]
Churches, theatres, cinemas		1.4	σ_{tot} = 0.5					0.02			3.5	1.10	0.08	95.8	No data available, partly based on the models provided by Melchers [7]
Museums, exhibition centres		1.16	σ_{tot} = 0.84		7.5	–	–	–	–	100	4	0.61	0.37	99.1	Gulvanessian and Holicky [5] and *fib* bulletin [8]
Sports facilities		-	-	-	-	1)1.25 2)1.40	2.5 0.78	1**	0.5	100	4.75	1.51 0.79	0.33 0.19	95.8 99.8	1) PMC [4] 2) Choi [9]
Retail shops		-	-	-	-	1) 1.25 2) 1.40	2.5 0.78	0.02	0.5	100	6.25	2.31 0.93	0.17 0.11	39.9 99.5	1) PMC [4] 2) Choi [9]
Department stores	100	1) 0.9 2) 0.63 3) 0.75 4) 0.6	0.6 σ_{tot} = 0.95 σ_{tot} = 0.5 σ_{tot} = 0.75	1) 1.6 2) – 3) – 4) –	1–5	0.4	1.1	1.0	1–14	100	4.5	1.56 0.60 0.42 0.55	0.73 0.35 0.27 0.43	94.3 99.7 100 99.7	1) PMC [4] 2) [5] and [9] 3) Melchers [7] 4)Judgment based on [1-3]

* Estimated from a point-in-time distribution of the sustained component, i.e. 7-year maxima for category A.

** According to [7].

Table 3 - Models of basic variables for time-invariant reliability analyses

Category of variables	Name of basic variables	Symb. X	Dimension	Distribution	Mean μ_X	St. deviation σ_X
Permanent	Permanent*	G	kN/m^2	N	G_k	$0.1\mu_X$
Imposed-area						
Area A	Imposed–5 years	Q	kN/m^2	GUM	$0.2Q_k$	$1.1\mu_X$
	Imposed–50 years	Q	kN/m^2	GUM	$0.5Q_k$	$0.55\mu_X$
Area B	Imposed–5 years	Q	kN/m^2	GUM	$0.2Q_k$	$1.1\mu_X$
	Imposed–50 years	Q	kN/m^2	GUM	$0.6Q_k$	$0.35\mu_X$
Areas C1	Imposed–50 years	Q	kN/m^2	GUM	$0.55Q_k$	$0.5\mu_X$
Areas C2	Imposed–50 years	Q	kN/m^2	GUM	$1.1Q_k$	$0.1\mu_X$
Areas C3	Imposed–50 years	Q	kN/m^2	GUM	$0.6Q_k$	$0.4\mu_X$
Areas C4	Imposed–50 years	Q	kN/m^2	GUM	$0.8Q_k$	$0.2\mu_X$
Areas C5	Imposed–50 years	Q	kN/m^2	GUM	$0.95Q_k$	$0.15\mu_X$
Areas D1	Imposed–50 years	Q	kN/m^2	GUM	$0.55Q_k$	$0.35\mu_X$
Areas D2	Imposed–50 years	Q	kN/m^2	GUM	$0.7Q_k$	$0.25\mu_X$
Material strengths	Steel yield	f_y	MPa	LN	$f_{yk}+2\sigma$	$0.05\mu_X$ -0. $08\mu_X$
	Concrete	f_c	MPa	LN	$f_{ck}+2\sigma$	$0.05\mu_X$ -$0.15\mu_X$
	Reinforcement	f_y	MPa	LN	$f_{yk}+2\sigma$	$0.05\mu_X$ -$0.07\mu_X$
	Timber par. to gr.	f_c	MPa	LN	$f_{ck}+2\sigma$	$0.20\mu_X$ -$0.25\mu_X$
	Solid masonry	f_c	MPa	LN	$f_{ck}+2\sigma$	$0.17\mu_X$ -$0.30\mu_X$
Geometry steel sect.	IPE profiles	A,W,I	m^{2,3,4}	N	$0.99X_{nom}$	$0.01\mu_X$ -$0.04\ \mu_X$
	L-section, rods	A,W,I	m^{2,3,4}	N	$1.02X_{nom}$	$0.01\mu_X$ -$0.02\ \mu_X$
Geometry concrete cross-sect.	Cross-section	$b,\ h$	m	N	b_k,h_k	0.005-0.01
	Cover of reinforc.	a	m	BETA	a_k	0.005-0.015
	Additional ecc.	e	m	N	0	0.003-0.01
Model uncertainties**	Load effect factor	θ_E	–	N	1	0.05-0.10
	Resistance factor	θ_R	–	N	1-1.25	0.05-0.20

* For the self-weight the standard deviation is commonly in a range from 0.03 to 0.05. Permanent actions and and self-weight are not distinguished here.

** Depend on uncertainty of loading, its effects, material properties and models for resistance.

3 National selection of the NDPs used in the reliability analyses

The NDPs values used in the reliability analysis are the Recommended Values (RVs) provided in the Eurocodes, herein called CEN Recommended Values, and the parameters values adopted by the Member States. The alternative choices provided by CEN for the combination of actions and the recommended values for the reduction and partial factors are given in EN 1990, Annex 1, Clause A1.3.1 (1), Table A1.2(B).

As referred in section 2.1, the selection of the alternative expression (6.10) provided in EN 1990 for the fundamental combination of actions is called here *procedure a*; when only the twin expressions (6.10a) and (6.10b) are used, it is called *procedure b*; when in the first one of the twin expressions only permanent actions are applied (here denoted as twin expressions ($6.10a_{mod}$ and 6.10b) then it is called *procedure c*; finally when there is the national possibility of application of both *procedures*, *a* or *b*, i.e. when the national choice comprises expression (6.10), but also expressions (6.10a, 6.10b), it is called *procedure a + b*. Table 4 summarizes the possible procedures to be adopted by Member States for the fundamental combination of actions.

Table 4 - Possible procedures for the fundamental combination of actions

Procedure	EN 1990 expressions
a	6.10
b	6.10a & 6.10b
c	$6.10a_{mod}$ & 6.10b
possibility of application of both procedures a + b	6.10, or 6.10a & 6.10b

The national selection of the fundamental combination of actions for the verification of structural members with respect to the ULS of type STR including the reduction factor for permanent load, ξ**,** and the partial factors for permanent and variable actions, γ_G and γ_Q, is illustrated in Table 5. The NDPs values shown in Table 5 have been extracted from the JRC NDPs Database in 2017.

National Annexes were also examined to bridge information gaps related to NDP values not uploaded to the Database. The NDP values obtained from the available National Annexes are presented in Table 6.

In case where both alternatives are used (*a* + *b*), one **alternative** is **commonly preferred** in a Member State (MS), which is highlighted in **bold** in Table 5 and Table 6. The fundamental combination of actions favoured by the countries is identified in the second column of those tables. Supplementary conditions may be given for its application that are specified as notes in the table. For instance, *procedure b* can be used in Belgium and Luxembourg, when the low variability of permanent actions is assured. In Hungary, the *procedure b* can be used only when in addition of Ultimate Limit States also the Serviceability Limit States (SLS) of structures are to be verified by calculation, while in Slovakia the *procedure b* is only allowed for verification of existing structures. In some countries, the information on the selection of the combination is not available (e.g. in Poland). Countries that did not upload the NDPs for the combination of actions or imposed loads are not included in the present report.

Table 5 - Fundamental combination of actions for verification of ULS and partial factors of actions uploaded in the NDPs Database

Countries	Selected combination of actions[1]	EN 1990 expressions		Coefficient ξ	Partial factor γ_G	Partial factor γ_Q
		(6.10)	(6.10a) & (6.10b)			
CEN	**a, b**, c	x	x	**0.85**	**1.35**	**1.5**
BEL	**a** + b	**x**	x	RV	RV	RV
BGR	a	x		-	RV	RV
CYP	a	x		-	RV	RV
CZE	a + **b**	x	**x**	RV	RV	RV
DNK	c		x[2]	1	1.2/1	RV
FIN	c		x[2]	1	1.35/1.15 K_{FI}	1.5 K_{FI}
FRA	a	X		-	RV	RV
GBR	a + b	x	x	0.925	RV	RV
HRV	a	x		-	1.1/1.35	RV
HUN	**a** + b	**x**	x	RV	RV	RV
IRL	**a** + b	**x**	x	RV	RV	RV
LUX	**a** + b	**x**	x	RV	RV	RV
LVA	a + b	x	x	RV	RV	RV
PRT	a	x		-	RV	RV
SVN	a	x		-	RV	RV
SWE	b		x	0.89	RV	RV

[1] Preferred procedure of MS is highlighted in bold

[2] *Procedure c* is used, (6.10a$_{mod}$) & (6.10b)

BEL: *Procedure b* can be used only for permanent actions with low variability.

BGR: National Annex to EN 1990 was uploaded in the JRC NDPs Database.

CZE: *Procedure b* is recommended as favourable in the National Annex.

DNK: The material partial factor γ_m in Denmark is multiplied by K_{FI} and is equal to 1.2 for (6.10a) and to 1.0 for (6.10b).

FIN: NDPs are uploaded in the JRC Database, but information given in the National Annex was considered in the analysis.

HRV: Differentiation of partial factors is given in the National Annex (1.1 for self-weight and 1.35 for other permanent loads) while in the JRC database the partial factors are given as RV. The partial factor γ_G=1.1 was considered in the analysis.

HUN: *Procedure b* is allowed only when SLS are verified by calculation.

LUX: National Annex for EN 1990 was uploaded in the JRC NDPs Database. *Procedure b* can be used in case of assurance of low variability of *G*.

Table 6 - Fundamental combination of actions for verification of ULS and partial factors of actions given in available National Annexes which were not uploaded in 2017 to the JRC Database.

Countries	Selected combination of actions	EN 1990 expressions		Coefficient ξ	Partial factor γ_G	Partial factor γ_Q
		(6.10)	(6.10a) & (6.10b)			
CEN	**a, b**, c	x	x	**1.35**	**1.5**	**CEN**
LTU	a + b	x	x	RV	RV	1.3
NLD	b		x	0.89	RV	RV
NOR	b		x	0.89	RV	RV
SVK	a	x	x	-	RV	RV

SVK: *Procedure b* is allowed only for verification of existing structures.

The analysis of Table 5 and Table 6 shows that the *procedure a* was chosen by seven countries among the 20 countries considered in the analysis, *procedure b* was chosen by three, *procedure a + b* was chosen by eight and *procedure c* was chosen by two countries.

With regard to the reduction factor ξ for permanent load, 7 out of 13 countries accepted the Recommended Value (RV) proposed by CEN, whereas the partial factor γ_G for permanent actions was accepted by 17 countries, the partial factor γ_Q for variable actions by 18 countries among a total of 20 countries.

Table 7 presents the characteristic values of uniformly distributed imposed loads, q_k, selected by countries for the categories of loaded areas A to D in buildings. The NDP is given in EN 1991-1-1, clause 6.3.1.2 (1). The ranges of imposed loads provided by CEN are also shown in Table 7, where the values highlighted in bold are recommended to be used. CEN recommended values for category A were fully accepted by 12 countries; for category B, CEN recommended values were fully accepted by 10 countries; for categories C1, C2, C3, C4 and C5 by 13, 16, 15, 19 and 15 countries, respectively, and for categories D1 and D2 by 13 and 18 countries, respectively. For each of the categories of loaded areas C1, C3 and C4, one country selected a characteristic value out of the range of values provided by CEN. In cases where a country has not selected a characteristic value of imposed loads q_k, since it has identified a range of permissible values or more than one value (e.g. several subcategories could be applied), the CEN recommended value was applied in the reliability calculations made in the current report.

Table 8 illustrates the values of partial factors selected by the countries for concrete, reinforcement, steel, timber and for the type of masonry considered in the analysis. The CEN recommended values of partial factors given in Eurocodes EN 1992 to EN 1996 are also presented in Table 8.

When the information on the partial factors for materials is not available (represented by NU in Table 8), the CEN recommended values (RVs) are used in the analysis. Slovakia has no available information on partial factors for steel, Belgium, Lithuania, Luxembourg, and Portugal have no information for timber, and Belgium, Luxembourg, Norway, Slovakia and Slovenia has no information for masonry.

Table 7 - Uniformly distributed imposed loads q_k (in kN/m^2) selected by countries, for categories of use A to D, and the range proposed by CEN with recommended value in bold

Country	Category of use[1]								
	A	**B**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**	**D2**
CEN	1.5 – **2**	2 – **3**	2 – **3**	3 – **4**	3 – **5**	4.5 – **5**	**5** – 7.5	**4** – 5	4 – **5**
BEL	RV	RV	RV	RV	RV	RV	RV	5	RV
BGR	RV	RV	RV	RV	RV	RV	7.5	RV	RV
CYP	RV	RV	RV	RV	RV	RV	RV	5	RV
CZE	1.5	2.5	RV	RV	RV	RV	RV	5	RV
DNK	1.5	2.5	2.5	RV	RV	RV	RV	RV	RV
FIN	RV	2.5	2.5	3	4	RV	6	RV	RV
FRA	1.5	2.5	2.5	RV	4	RV	RV	5	RV
GBR	1.5-2.5	2.5/RV	2-RV	3/RV	3-7.5	RV	RV/7.5	RV	4
HRV	1.5/RV	2/RV	RV	RV	RV	RV	RV	2	RV
HUN	RV	RV	RV	RV	RV	RV	RV	RV	RV
IRL	1.5/RV	RV	RV	RV	RV	RV	RV	RV	RV
LTU	1.5	2	RV	RV	RV	RV	RV	RV	RV
LUX	RV	RV	RV	RV	RV	RV	RV	5	RV
LVA	RV	2.5	2.5	3	4	RV	6.0	RV	RV
NLD	1.75	2.5	4	RV	RV	RV	RV	RV	4
NOR	RV	RV	RV	RV	RV	RV	RV	5	RV
PRT	RV	RV	RV	RV	RV	RV	6.0	RV	RV
SVK	RV	RV	RV	RV	RV	RV	RV	RV	RV
SVN	RV	RV	RV	RV	RV	RV	RV	RV	RV
SWE	RV	2.5	2.5	2.5	3	4.0	RV	RV	RV

[1] Stairs and balconies are not considered.

BGR: The RV was adopted in the calculations for the category of use D1, although the uploaded value in JRC Database by Bulgaria was the following: "the value for q_k should be not less than 4.0".

GBR: National subcategories of use are not illustrated in the table; boundary values are shown, as for example, 1.5-2.5 for category A, or possible values are shown, as for example 2.5/RV for category B.

HRV: For the category of use A, the subcategory A1 is valid for floors with satisfactory lateral distribution where 1.5 kN/m^2 is applied, and A2 for floors without lateral distribution where the imposed load 2 kN/m^2 is given.

HUN: Other values within the ranges given in Table 6.2 of EN 1991-1-1 may be used subject to approval from the client and the regulatory authorities.

IRL: National subcategories of use are not illustrated in the table, but possible values are shown. Other values within the ranges given in Table 6.2 of EN 1991-1-1 may be used subject to approval from the client and the regulatory authorities.

FIN: Information was obtained from available NAs, since Finland did not upload the JRC NDPs Database.

LUX: National Annexes were uploaded in the JRC NDPs Database.

Table 8 - Partial factors for concrete, reinforcement, steel, timber and masonry selected by countries and recommended values proposed by CEN

Countries	NDPs				
	EN 1992 1-1 2.4.2.4 (1)	**EN 1992-1-1 2.4.2.4 (1)**	**EN1993-1-1 6.1 (1) NOTE 2B**	**EN 1995 1-1 2.4.1 (1) NOTE 2**	**EN 1996 1-1 2.4.3 (1) Class 2**
	γ_C	γ_S	γ_{M0}, γ_{M1}[1]	γ_M **solid timber**	γ_M **units of Category II, any mortar**[a,b,e]
CEN	**1.5**	**1.15**	**1.0**	**1.3**	**2.2**
BEL	RV	RV	RV	NU[2]	NU
BGR	RV	RV	1.05	RV	RV
CYP	RV	RV	RV	RV	RV
CZE	RV	RV	RV	RV	NU for class 2 uploaded 2.5 for a middle class
DNK	1.45	1.2	1.1; 1.2	1.35	1.7
FIN	RV	RV	RV	RV	RV
FRA	RV	RV	RV	RV	2.8 Class = IL2
GBR	RV	RV	RV	RV	2.5 or 2.7 or 3.0 for class of execution control 2A)
HRV	RV	RV	RV	RV	2.5
HUN	RV	RV	RV	RV	RV
IRL	RV	RV	RV	RV	RV
LTU	RV	RV	RV	NU	3.0 Class of execution B
LUX	RV	RV	RV	NU	NU
LVA	RV	RV	RV	RV	2.7 Class of execution II
NLD	RV	RV	RV	RV	1.7
NOR	RV	RV	1.05	1.25	NU
PRT	RV	RV	RV	NU	2.5 (no class)
SVK	RV	RV	NU	RV	NU
SVN	RV	RV	RV	RV	NU
SWE	RV	RV	RV	RV	3.0 Class of execution II

[1] The partial factor γ_{M0} is used for common resistance verifications of cross-sections (in the analysis of the steel beam), γ_{M1} is used for cases of instability verifications (in the analysis of the steel column); the partial factors for fatigue and joints verifications are not given in Table 3.5, as they are not applied in the calculations.

[2] NU – Not uploaded yet

DNK: Values selected for assumed conditions (e.g. normal inspection level, masonry units of category II)

FIN: Information was obtained from available NAs, since Finland did not upload the JRC NDPs Database

GRB: The used value for γ_M = 3.0

LUX: National Annexes were uploaded in the JRC NDPs Database

Table 9 illustrates the values of the combination factor ψ_0 recommended by CEN for imposed loads on floors in buildings of categories A to D and the values selected by the countries that have not accepted the recommended values, *i.e.*, Denmark and the Netherlands.

Table 9 - Combination factor ψ_0 for the categories of areas A to D of imposed loads recommended by CEN and selected by Denmark and the Netherlands

Factor ψ_0 for categories of imposed loads	**CEN and most MS**	**DNK**	**NLD**
A	**0.7**	0.5	0.4
B	**0.7**	0.6	0.5
C1 to C5	**0.7**	0.6	0.25
D1 and D2	**0.7**	0.6	0.4

The reliability analysis of a structural member considering the combination of two different imposed loads, CEN recommended value for the combination factor ψ_0 and the national selection of this factor by Denmark and the Netherlands, as presented in Table 9, is illustrated in chapter 5.

4 Reliability of structural members using the NDPs selected by Member States

4.1 Introduction

This chapter presents the reliability levels of selected structural members designed according to the nationally selected NDPs, considering uniformly distributed imposed loads of categories A to D and specific load ratios.

Section 4.2 gives the reliability levels for a steel tie and a steel column for two common load ratio (χ) values between the characteristic value of the imposed load and the characteristic value of the total load, namely, χ = 0.3 and χ = 0.4. The difference, in relative terms (expressed in percentages), to the recommended value for the reliability index β_t is also shown.

In section 4.3, the reliability analysis is made for a reinforced concrete beam and column with the objective of studying the influence (sensitivity) of the variability of concrete compressive strength to the reliability levels. For that purpose, three different values of the coefficient of variation, *i.e.*, $V_{\theta R}$ equal to 0.05, 0.1 and 0.15, are considered to model the uncertainty of concrete resistance, aiming to take into account a higher or a lower quality of concrete production and execution on site. The analysis is made for the load ratio χ = 0.4. The relative ratio, in percentage terms, to the recommended value for the reliability index β_t is also shown.

Finally, section 4.4 presents the minimum and maximum values of reliability indices for values of the load ratio ranging from a lower bound equal to 0, for which permanent loads prevail, to an upper bound equal to 0.7, with significant contribution of imposed load. The reliability indices for a typical load ratio value equal to 0.4 are also shown. Annex A presents the same information as in tables in section 4.4, but in percentage terms measuring the relative ratio to the recommended value for the reliability index β_t (Table 28 to Table 36). Annex B shows the load ratios for which the reliability indices achieve the minimum and the maximum values (Table 37 to Table 45).

The reliability analysis was made for the following structural members: a *concrete beam*, *column* and *slab*, a *steel tie* and *column*, a *composite steel concrete slab*, a *timber beam* and *column*, and a *masonry wall*.

All the tables presented in chapter 4 contain the following common features and results:

— the reliability indices β_t for structural members designed according to **CEN recommended values** are highlighted in ***italic*** and ***bold***.

— the alternative procedure adopted by the MS for the fundamental combination of actions is shown in the last column of the tables. There are eight MS, which have the possibility of application of both procedures, *i.e.*, a + b. The procedure adopted in the calculations is identified in *italic underlined* as follows: *a* + b or a + *b*. To begin with, the results are presented for structural member designed according to CEN recommended values and for the complete set of 20 countries using the respective choice of load combinations. For CEN, and for the eight countries where the application of *procedures a* or *procedure b* is allowed, the calculation is firstly made adopting *procedure a*, identified as *a* + *b*. Below, in the same table, the reliability levels are calculated adopting *procedure b,* identified as a + *b,* for CEN and for the eight countries where there is the possibility of application of the two procedures.

— reliability levels are shaded in red in case they are lower than the indicative level, β_t, of the Reliability Classes RC2 and RC3 given in EN 1990 and shaded in blue otherwise. In both cases, the greater the difference to the target reliability levels, the stronger is the colour of the shade covering the reliability levels. A common colour scale is used in the complete set of tables of chapter 4. As previously stated in section 2.3, for a 50 years reference period, the recommended value for the reliability index β_t of the Reliability Class RC2 is **3.8**, *i.e.*, for the categories of loaded areas A, B, C1, C2, C3, D1 and D2. The recommended value for the reliability index β_t of Reliability Class RC3 is **4.3**, *i.e.*,

for the categories of loaded areas C4 and C5. The latter categories, C4 and C5, are representative of buildings with prevailing areas used for sport activities or for public gathering spaces, like for instance concert halls (see Table 1). In some cases, reliability levels equal to 3.8 are shaded red since the results are below 3.8, but rounded do one decimal place. Note that **Denmark** set up in its National Annex of EN 1990 a target reliability index β_t = 4.3 for the class RC2 of structural members, and β_t = 4.7 for the class RC3 for the reference period of 1 year, which was considered to correspond to β_t **= 3.3** for the class RC2, and β_t **= 3.8** for the class RC3 for a reference period of 50 years.

4.2 Reliability levels of steel members for two typical load ratios

Table 10 to Table 13 present the results of the analysis of reliability levels of two steel structural members, respectively, a steel tie and a steel column, considering uniformly distributed imposed loads for building areas of categories A to D, designed according to the nationally selected NDPs and for two load ratios, $\chi = 0.3$ and $\chi = 0.4$, between the characteristic values of the imposed loads and the characteristic value of the total load. These values correspond to typical load ratios for steel structures and the study aims to analyse the influence of the variation of load ratios on the reliability levels of steel members designed according to CEN Recommended Values and to the NDPs selected by MS.

In most cases, the reliability levels of a **steel tie** (Table 10 and Table 11), designed according to the NDPs selected by MS, satisfy the reliability levels indicated in EN 1990. Bulgaria, Cyprus, Denmark, France, Norway, Portugal, Slovakia and Slovenia achieved reliability levels higher than the recommended for all categories of imposed loads. However, the great majority of Member States that have the possibility to adopt the *procedure b* for the combination of actions*, i.e.,* expressions (6.10a and 6.10b), achieved a reliability level lower than the recommended level of 4.3 for buildings of category C5 (concert halls, sports halls). For the same category C5, the reliability levels of a steel tie designed according to CEN recommended values, are below the target β_t with a maximum relative difference up to 12% (see Table 11). The category A (residential buildings and houses) also show a number of MS with reliability levels lower than the recommended, mainly when *procedure b* is adopted. In this case, Lithuania achieved reliability levels lower than the recommended for most categories of imposed loads, exception made for C4 and D2. The lowest reliability level for a steel tie is also achieved by Lithuania for *procedure b*, being 23% lower than the target reliability level. Note that Lithuania has chosen a partial factor γ_Q for the imposed load *Q* equal to 1.3 whereas nearly all countries have adopted the RV, *i.e.*, γ_Q = 1.5. The reliability levels obtained for the load ratio $\chi = 0.3$ are slightly higher than the reliability levels obtained for the load ratio $\chi = 0.4$, for almost all building categories, except for C2 (churches, theatres, cinemas).

In the majority of cases, the reliability levels of a **steel column** (see Table 12 and Table 13), designed according to the selected NDPs by the MS, satisfy the reliability level indicated in EN 1990. However, for buildings of category C5 (concert halls, sports halls), when *procedure b* is chosen, reliability levels are always lower than the recommended. In those conditions, a steel column designed according to CEN recommended values achieved a reliability level lower than the recommended target level, showing a relative difference of 12%, for the load ratio $\chi = 0.4$ (see Table 13). For the load ratio $\chi = 0.3$, the category C2 (churches, theatres, cinemas) also has a large number of MS with reliability levels lower than the recommended, when *procedure b* is chosen. Nevertheless, the global picture of the results obtained for a steel column is slightly better than for a steel tie, with a large number of MS achieving reliability levels higher than the recommended.

It should be noted that the dynamic character of the imposed loads C4, C5 is not considered here.

Table 10 - Reliability levels for the load ratios χ = 0.3 and χ = 0.4, considering uniform imposed loads for categories of use A to D - **steel tie**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	
CEN	***4.5***	***4.1***	***5.2***	***4.9***	***4.7***	***4.3***	***4.8***	***4.8***	***4.9***	***4.5***	***5.8***	***5.5***	***4.9***	***4.6***	***4.8***	***4.5***	***5.2***	***5.0***	**a+b**
BEL	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	5.3	5.0	5.2	5.0	a+b
BGR	4.8	4.4	5.6	5.2	5.0	4.5	5.3	5.3	5.3	4.8	6.2	5.9	6.5	6.4	5.1	4.8	5.6	5.3	a
CYP	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	5.3	5.0	5.2	5.0	a
CZE	4.1	3.7	4.8	4.4	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	5.3	5.0	5.2	5.0	a+b
DNK	4.0	3.8	4.7	4.6	4.2	4.0	4.7	5.1	4.9	4.7	5.7	5.7	4.7	4.6	5.2	5.2	5.1	5.2	c
FIN	3.9	3.7	4.0	3.9	3.6	3.4	3.1	3.2	3.8	3.6	4.9	4.9	4.5	4.6	3.9	3.9	4.3	4.4	c
FRA	4.1	3.7	4.8	4.4	4.3	3.9	4.8	4.8	4.5	4.1	5.8	5.5	5.2	5.0	5.3	5.0	5.2	5.0	a
GBR	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	4.8	4.5	4.6	4.4	a+b
HRV	3.7	3.6	4.3	4.3	3.9	3.8	3.5	3.8	4.1	4.0	4.6	4.7	3.6	3.6	3.1	3.1	4.1	4.2	a
HUN	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	4.8	4.5	5.2	5.0	a+b
IRL	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	4.8	4.5	5.2	5.0	a+b
LTU	3.9	3.5	4.0	3.6	4.4	3.9	4.3	4.3	4.6	4.2	5.4	5.1	4.5	4.2	4.4	4.1	4.8	4.5	a+b
LUX	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	5.3	5.0	5.2	5.0	a+b
LVA	4.5	4.1	4.8	4.4	4.3	3.9	4.2	4.1	4.5	4.1	5.8	5.5	5.2	5.0	4.8	4.5	5.2	5.0	a+b
NLD	3.9	3.6	4.2	4.0	4.3	4.1	4.1	4.3	4.4	4.2	5.1	5.1	4.1	4.0	4.1	4.0	4.0	3.9	b
NOR	4.4	4.1	5.1	4.8	4.5	4.2	4.5	4.7	4.8	4.5	5.5	5.4	4.6	4.4	5.1	4.9	4.9	4.9	b
PRT	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	5.2	5.0	4.8	4.5	5.2	5.0	a
SVK	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	4.8	4.5	5.2	5.0	a
SVN	4.5	4.1	5.2	4.9	4.7	4.3	4.8	4.8	4.9	4.5	5.8	5.5	4.9	4.6	4.8	4.5	5.2	5.0	a
SWE	4.1	3.8	4.2	4.0	3.8	3.6	3.7	3.8	4.0	3.8	5.0	4.9	4.1	4.0	4.1	4.0	4.5	4.5	b
CEN	***3.9***	***3.7***	***4.5***	***4.4***	***4.0***	***3.9***	***3.8***	***4.0***	***4.2***	***4.1***	***4.9***	***4.9***	***4.1***	***3.8***	***4.0***	***3.9***	***4.3***	***4.4***	**a+b**
BEL	3.9	3.7	4.5	4.4	4.0	3.9	3.8	4.0	4.2	4.1	4.9	4.9	4.1	3.8	4.5	4.5	4.3	4.4	a+b
CZE	3.6	3.3	4.0	3.9	4.0	3.9	3.8	4.0	4.2	4.1	4.9	4.9	4.1	3.8	4.5	4.5	4.3	4.4	a+b
GBR	4.2	3.9	4.9	4.7	4.4	4.1	4.3	4.5	4.6	4.3	5.3	5.2	4.4	4.2	4.3	4.2	4.2	4.1	a+b
HUN	3.9	3.7	4.5	4.4	4.0	3.9	3.8	4.0	4.2	4.1	4.9	4.9	4.1	3.8	4.0	3.9	4.3	4.4	a+b
IRL	3.9	3.7	4.5	4.4	4.0	3.9	3.8	4.0	4.2	4.1	4.9	4.9	4.1	3.8	4.0	3.9	4.3	4.4	a+b
LTU	3.4	3.0	3.4	3.0	3.7	3.5	3.4	3.4	3.9	3.7	4.6	4.4	3.9	3.3	3.8	3.5	4.0	3.9	a+b
LUX	3.9	3.7	4.5	4.4	4.0	3.9	3.8	4.0	4.2	4.1	4.9	4.9	4.1	3.8	4.5	4.5	4.3	4.4	a+b
LVA	3.9	3.7	4.0	3.9	3.6	3.4	3.3	3.2	3.8	3.6	4.9	4.9	4.3	4.2	4.0	3.9	4.3	4.4	a+b

Table 11 - Reliability levels (**%**) relative to CEN target for the load ratios χ = 0.3 and χ = 0.4, considering uniform imposed loads for categories of use A to D - **steel tie**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	
CEN	***19.5***	***8.7***	***37.6***	***29.1***	***22.9***	***12.1***	***25.7***	***27.5***	***29.7***	***19.6***	***34.5***	***28.5***	***13.7***	***6.5***	***25.3***	***17.4***	***35.7***	***30.6***	**a+b**
BEL	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	38.4	31.1	35.7	30.6	a+b
BGR	27.4	14.7	47.2	36.5	30.8	18.2	38.2	39.5	38.5	26.4	44.3	36.8	51.5	48.0	35.2	25.3	46.3	39.4	a
CYP	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	38.4	31.1	35.7	30.6	a
CZE	9.0	-2.0	25.4	16.5	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	38.4	31.1	35.7	30.6	a+b
DNK	22.2	14.8	42.0	37.9	27.6	20.3	43.5	54.8	49.8	43.3	50.4	50.2	22.5	21.5	58.4	56.2	55.2	56.2	c
FIN	2.8	-2.0	4.7	2.7	-4.9	-9.6	-18.1	-16.2	-0.8	-4.5	13.6	13.6	5.5	6.5	3.1	2.1	13.6	15.3	c
FRA	9.0	-2.0	25.4	16.5	12.6	1.8	25.7	27.5	18.4	8.2	34.5	28.5	20.9	15.1	38.4	31.1	35.7	30.6	a
GBR	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	25.3	17.4	21.8	15.3	a+b
HRV	-1.6	-4.8	13.1	13.2	2.2	-0.9	-7.0	1.1	7.0	5.1	8.0	9.6	-16.5	-17.1	-18.9	-19.5	7.7	11.2	a
HUN	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	25.3	17.4	35.7	30.6	a+b
IRL	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	25.3	17.4	35.7	30.6	a+b
LTU	2.3	-8.9	5.0	-5.3	14.7	3.9	13.8	12.4	20.7	10.5	25.3	18.2	5.8	-3.2	17.0	8.4	25.6	19.6	a+b
LUX	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	38.4	31.1	35.7	30.6	a+b
LVA	19.5	8.7	25.4	16.5	12.6	1.8	9.4	6.6	18.4	8.2	34.5	28.5	20.9	15.1	25.3	17.4	35.7	30.6	a+b
NLD	1.7	-4.8	10.2	6.4	13.6	7.1	6.8	12.2	16.6	11.2	19.1	17.5	-3.8	-7.2	9.1	6.2	4.5	2.9	b
NOR	15.3	7.0	33.0	27.4	19.0	10.7	19.1	24.1	25.4	18.0	28.9	25.9	6.5	2.2	33.1	28.9	30.1	28.2	b
PRT	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	20.9	15.1	25.3	17.4	35.7	30.6	a
SVK	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	25.3	17.4	35.7	30.6	a
SVN	19.5	8.7	37.6	29.1	22.9	12.1	25.7	27.5	29.7	19.6	34.5	28.5	13.7	6.5	25.3	17.4	35.7	30.6	a
SWE	7.3	0.8	10.2	6.4	-0.2	-6.6	-1.9	1.3	4.3	-1.1	15.7	13.7	-3.8	-7.2	9.1	6.2	19.5	19.4	b
CEN	***2.6***	***-2.1***	***18.0***	***16.4***	***6.4***	***1.7***	***-0.5***	***6.3***	***11.5***	***8.0***	***13.3***	***13.4***	***-4.5***	***-12.4***	***6.2***	***1.9***	***13.3***	***15.1***	**a+b**
BEL	2.6	-2.1	18.0	16.4	6.4	1.7	-0.5	6.3	11.5	8.0	13.3	13.4	-4.5	-12.4	17.4	17.2	13.3	15.1	a+b
CZE	-6.5	-14.0	5.5	2.5	6.4	1.7	-0.5	6.3	11.5	8.0	13.3	13.4	-4.5	-12.4	17.4	17.2	13.3	15.1	a+b
GBR	11.3	3.4	28.1	22.9	14.8	7.0	12.9	17.1	20.8	14.0	24.1	21.1	1.9	-2.7	14.4	9.8	10.1	7.0	a+b
HUN	2.6	-2.1	18.0	16.4	6.4	1.7	-0.5	6.3	11.5	8.0	13.3	13.4	-4.5	-12.4	6.2	1.9	13.3	15.1	a+b
IRL	2.6	-2.1	18.0	16.4	6.4	1.7	-0.5	6.3	11.5	8.0	13.3	13.4	-4.5	-12.4	6.2	1.9	13.3	15.1	a+b
LTU	-11.6	-21.8	-10.1	-22.0	-2.6	-7.4	-10.9	-10.2	1.7	-2.0	6.2	2.0	-10.4	-23.2	-0.1	-8.1	4.3	2.9	a+b
LUX	2.6	-2.1	18.0	16.4	6.4	1.7	-0.5	6.3	11.5	8.0	13.3	13.4	-4.5	-12.4	17.4	17.2	13.3	15.1	a+b
LVA	2.6	-2.1	5.5	2.5	-4.2	-9.8	-14.3	-16.5	-0.1	-4.7	13.3	13.4	1.0	-2.8	6.2	1.9	13.3	15.1	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 12 - Reliability levels for the load ratios χ = 0.3 and χ = 0.4, considering uniform imposed loads for categories of use A to D - **steel column**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	
CEN	***4.6***	***4.4***	***5.0***	***4.9***	***4.7***	***4.5***	***4.4***	***4.4***	***4.8***	***4.7***	***5.2***	***5.2***	***4.5***	***4.4***	***4.6***	***4.5***	***4.8***	***4.9***	**a+b**
BEL	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	5.0	5.0	4.8	4.9	a+b
BGR	4.8	4.6	5.3	5.2	4.9	4.7	4.7	4.8	5.1	4.9	5.5	5.5	5.6	5.7	4.9	4.8	5.1	5.1	a
CYP	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	5.0	5.0	4.8	4.9	a
CZE	4.3	4.0	4.6	4.5	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	5.0	5.0	4.8	4.9	a+b
DNK	4.2	4.1	4.6	4.6	4.3	4.2	4.3	4.6	4.8	4.8	5.2	5.3	4.4	4.4	4.9	5.1	4.8	5.0	c
FIN	4.1	4.0	4.0	4.1	3.8	3.7	3.3	3.3	3.9	3.9	4.6	4.7	4.3	4.4	4.0	4.0	4.2	4.4	c
FRA	4.3	4.0	4.6	4.5	4.4	4.1	4.4	4.4	4.5	4.3	5.2	5.2	4.7	4.7	5.0	5.0	4.8	4.9	a
GBR	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	4.6	4.5	4.4	4.4	a+b
HRV	3.9	3.9	4.3	4.4	4.0	4.0	3.5	3.8	4.1	4.2	4.4	4.6	3.6	3.6	3.3	3.4	4.0	4.3	a
HUN	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	4.6	4.5	4.8	4.9	a+b
IRL	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	4.6	4.5	4.8	4.9	a+b
LTU	4.1	3.8	4.0	3.8	4.4	4.2	4.1	4.0	4.6	4.4	4.9	4.9	4.3	4.1	4.4	4.2	4.5	4.5	a+b
LUX	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	5.0	5.0	4.8	4.9	a+b
LVA	4.6	4.4	4.6	4.5	4.4	4.1	4.0	3.9	4.5	4.3	5.2	5.2	4.7	4.7	4.6	4.5	4.8	4.9	a+b
NLD	4.0	3.9	4.2	4.2	4.4	4.3	3.9	4.0	4.4	4.4	4.7	4.8	4.0	4.0	4.1	4.2	4.0	4.0	b
NOR	4.5	4.3	4.8	4.9	4.6	4.4	4.2	4.4	4.7	4.6	5.0	5.1	4.3	4.3	4.8	4.9	4.7	4.8	b
PRT	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.7	4.7	4.6	4.5	4.8	4.9	a
SVK	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	4.6	4.5	4.8	4.9	a
SVN	4.6	4.4	5.0	4.9	4.7	4.5	4.4	4.4	4.8	4.7	5.2	5.2	4.5	4.4	4.6	4.5	4.8	4.9	a
SWE	4.2	4.1	4.2	4.2	4.0	3.8	3.7	3.8	4.1	4.0	4.6	4.7	4.0	4.0	4.1	4.2	4.4	4.5	b
CEN	***4.1***	***4.0***	***4.4***	***4.5***	***4.2***	***4.1***	***3.7***	***3.9***	***4.3***	***4.3***	***4.6***	***4.7***	***4.0***	***3.8***	***4.1***	***4.0***	***4.2***	***4.4***	**a+b**
BEL	4.1	4.0	4.4	4.5	4.2	4.1	3.7	3.9	4.3	4.3	4.6	4.7	4.0	3.8	4.4	4.5	4.2	4.4	a+b
CZE	3.8	3.6	4.1	4.1	4.2	4.1	3.7	3.9	4.3	4.3	4.6	4.7	4.0	3.8	4.4	4.5	4.2	4.4	a+b
GBR	4.3	4.2	4.7	4.7	4.4	4.3	4.0	4.2	4.6	4.5	4.9	5.0	4.2	4.1	4.3	4.3	4.1	4.1	a+b
HUN	4.1	4.0	4.4	4.5	4.2	4.1	3.7	3.9	4.3	4.3	4.6	4.7	4.0	3.8	4.1	4.0	4.2	4.4	a+b
IRL	4.1	4.0	4.4	4.5	4.2	4.1	3.7	3.9	4.3	4.3	4.6	4.7	4.0	3.8	4.1	4.0	4.2	4.4	a+b
LTU	3.6	3.3	3.6	3.3	3.9	3.8	3.4	3.5	4.0	4.0	4.3	4.3	3.8	3.5	3.9	3.7	4.0	4.0	a+b
LUX	4.1	4.0	4.4	4.5	4.2	4.1	3.7	3.9	4.3	4.3	4.6	4.7	4.0	3.8	4.4	4.5	4.2	4.4	a+b
LVA	4.1	4.0	4.1	4.1	3.8	3.7	3.3	3.3	3.9	3.9	4.6	4.7	4.1	4.1	4.1	4.0	4.2	4.4	a+b

Table 13 - Reliability levels (**%**) relative to CEN target for the load ratios χ = 0.3 and χ = 0.4, considering uniform imposed loads for categories of use A to D - **steel column**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	$\beta_{\|\chi=0.3}$	$\beta_{\|\chi=0.4}$	
CEN	***20.9***	***14.7***	***31.1***	***29.7***	***23.5***	***17.7***	***14.9***	***16.9***	***26.9***	***23.1***	***21.0***	***21.1***	***5.0***	***2.1***	***20.9***	***19.0***	***26.8***	***27.7***	**a+b**
BEL	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	30.7	30.4	26.8	27.7	a+b
BGR	27.4	20.1	38.4	36.0	30.0	23.1	23.1	25.1	33.9	29.0	28.0	27.6	30.9	32.7	28.3	25.6	34.5	34.7	a
CYP	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	30.7	30.4	26.8	27.7	a
CZE	12.2	5.3	21.8	19.1	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	30.7	30.4	26.8	27.7	a+b
DNK	26.5	22.9	38.4	40.3	30.8	27.7	31.5	40.0	46.5	46.6	35.8	40.7	14.6	16.2	49.8	54.5	45.2	51.7	c
FIN	7.2	5.3	6.0	7.5	0.8	-1.5	-14.4	-13.0	2.9	2.3	6.3	9.6	-0.7	2.1	4.3	6.4	10.7	15.5	c
FRA	12.2	5.3	21.8	19.1	15.1	8.6	14.9	16.9	18.0	13.2	21.0	21.1	9.9	8.4	30.7	30.4	26.8	27.7	a
GBR	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	20.9	19.0	16.7	15.5	a+b
HRV	3.5	2.8	12.4	16.3	6.6	6.1	-7.0	-1.2	9.0	10.6	2.3	6.5	-15.9	-15.2	-12.2	-11.2	6.5	12.2	a
HUN	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	20.9	19.0	26.8	27.7	a+b
IRL	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	20.9	19.0	26.8	27.7	a+b
LTU	6.8	-0.8	6.3	0.8	16.8	10.5	7.0	6.5	19.8	15.3	14.6	13.1	-0.4	-5.1	14.7	11.6	19.4	18.8	a+b
LUX	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	30.7	30.4	26.8	27.7	a+b
LVA	20.9	14.7	21.8	19.1	15.1	8.6	4.0	2.6	18.0	13.2	21.0	21.1	9.9	8.4	20.9	19.0	26.8	27.7	a+b
NLD	6.2	2.9	10.3	10.6	15.9	13.3	2.2	6.4	16.6	15.8	10.2	12.6	-7.0	-7.9	8.7	9.8	4.1	5.6	b
NOR	17.4	13.2	27.6	28.2	20.3	16.4	10.5	14.6	23.5	21.8	17.1	19.1	0.0	-1.1	26.7	28.6	22.7	25.7	b
PRT	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	9.9	8.4	20.9	19.0	26.8	27.7	a
SVK	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	20.9	19.0	26.8	27.7	a
SVN	20.9	14.7	31.1	29.7	23.5	17.7	14.9	16.9	26.9	23.1	21.0	21.1	5.0	2.1	20.9	19.0	26.8	27.7	a
SWE	10.8	7.8	10.3	10.6	4.6	1.2	-3.5	-1.0	6.9	5.2	7.8	9.7	-7.0	-7.9	8.7	9.8	15.0	18.7	b
CEN	***7.0***	***5.2***	***16.2***	***18.9***	***10.0***	***8.4***	***-2.6***	***2.4***	***12.6***	***13.1***	***6.1***	***9.4***	***-7.5***	***-11.8***	***6.6***	***6.3***	***10.5***	***15.3***	**a+b**
BEL	7.0	5.2	16.2	18.9	10.0	8.4	-2.6	2.4	12.6	13.1	6.1	9.4	-7.5	-11.8	15.0	18.9	10.5	15.3	a+b
CZE	-0.4	-5.3	6.6	7.3	10.0	8.4	-2.6	2.4	12.6	13.1	6.1	9.4	-7.5	-11.8	15.0	18.9	10.5	15.3	a+b
GBR	14.1	10.1	23.8	24.4	16.9	13.2	6.4	9.8	20.0	18.2	13.7	15.4	-3.1	-4.7	12.7	12.8	8.2	8.8	a+b
HUN	7.0	5.2	16.2	18.9	10.0	8.4	-2.6	2.4	12.6	13.1	6.1	9.4	-7.5	-11.8	6.6	6.3	10.5	15.3	a+b
IRL	7.0	5.2	16.2	18.9	10.0	8.4	-2.6	2.4	12.6	13.1	6.1	9.4	-7.5	-11.8	6.6	6.3	10.5	15.3	a+b
LTU	-4.6	-12.1	-5.3	-13.0	2.6	0.5	-9.6	-8.9	4.9	4.4	1.1	0.7	-11.7	-19.7	1.9	-1.9	4.0	5.6	a+b
LUX	7.0	5.2	16.2	18.9	10.0	8.4	-2.6	2.4	12.6	13.1	6.1	9.4	-7.5	-11.8	15.0	18.9	10.5	15.3	a+b
LVA	7.0	5.2	6.6	7.3	1.3	-1.6	-11.9	-13.2	3.4	2.2	6.1	9.4	-3.8	-4.8	6.6	6.3	10.5	15.3	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

4.3 Influence of concrete strength on resistance

The influence of the selection of the probabilistic model of concrete compressive strength on resulting reliability indices is analysed using the developed programs [2]. For the reliability analyses of selected reinforced concrete members, the probabilistic model for concrete compressive strength is based on the Eurocode EN 1992-1-1 and the Probabilistic Model Code [4].

The selected concrete used in the reliability analyses is of Class C20/25 having the characteristic value of compressive concrete strength f_{ck} = 20 MPa and the mean value f_{cm} = 28 MPa, based on EN 1992-1-1.

A two parameter lognormal distribution is considered to model the compressive strength of concrete and a common coefficient of variation of 0.10 is applied in reliability analyses. It should be noted that the hypothesis of using a greater or a lower coefficient of variation for the concrete compressive strength, has no significant impact on the resulting reliability of the considered concrete members.

More significant influence on resulting reliability levels of concrete members has the model uncertainty of resistance, which is expressed by the coefficient θ_R, with its mean and coefficient of variation. In the reliability analyses made for concrete members, the coefficient θ_R is considered to have a mean value $\mu_{\theta R}$ equal to 1.1 and a coefficient of variation $V_{\theta R}$ equal 0.10, which are values within the ranges presented in Table 3.

In case of a higher or a lower coefficient of variation is assumed, $V_{\theta R}$ = 0.15 or $V_{\theta R}$ = 0.05, respectively, considering for example a higher or a lower quality of concrete production and execution on site (see EN 1992-1-1, Annex A), the resulting reliability indices for a reinforced concrete beam and column are exemplified in Table 14 to Table 17.

In the vast majority of cases, the reliability level of the reinforced concrete members satisfy the recommended reliability levels indicated in EN 1990. The model uncertainty of resistance has influence on the results of the analysis, since the higher is the coefficient of variation $V_{\theta R}$, the lower is the resulting reliability level for the reinforced concrete members.

For the **reinforced concrete beam** and higher value of the coefficient of variation $V_{\theta R}$ (0.15), the recommended reliability level is not achieved only for the category of use C5 (Reliability Class RC3), where 13 out of 20 countries do not fulfil the recommended reliability level indicated in EN 1990, mainly when *procedure b* is chosen (Table 14 and Table 15).

For the **reinforced concrete column**, only one case out of the 810 calculated reliability levels shown in Table 16 has not met the criterion indicated in EN 1990. It is the reliability level obtained by Lithuania when using *procedure b*, for $V_{\theta R}$ = 0.15 and for the category of use C5.

Table 14 - Reliability levels for three different values of the coefficient of variation $V_{\theta R}$, considering uniformly distributed imposed loads for categories A to D2 – **reinforced concrete beam**

MS/cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
$V_{\theta R}$	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	
CEN	***5.2***	***4.9***	***4.5***	***5.9***	***5.5***	***4.9***	***5.3***	***5.0***	***4.6***	***5.9***	***5.1***	***4.3***	***5.6***	***5.3***	***4.8***	***6.5***	***5.8***	***5.0***	***5.7***	***5.0***	***4.3***	***5.6***	***5.1***	***4.5***	***6.0***	***5.4***	***4.8***	***a+b***
BEL	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	6.0	5.5	4.9	6.0	5.4	4.8	a+b
BGR	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	6.8	6.0	5.1	5.6	5.1	4.5	6.0	5.4	4.8	a
CYP	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	6.0	5.5	4.9	6.0	5.4	4.8	a
CZE	4.8	4.6	4.2	5.5	5.1	4.6	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	6.0	5.5	4.9	6.0	5.4	4.8	a+b
DNK	4.2	4.0	3.6	4.9	4.5	4.0	4.4	4.1	3.8	5.0	4.3	3.7	5.0	4.7	4.3	5.7	5.1	4.4	4.7	4.2	3.6	5.4	4.9	4.4	5.3	4.8	4.2	c
FIN	4.8	4.6	4.2	5.1	4.7	4.2	4.6	4.3	4.0	4.7	4.0	3.4	4.8	4.5	4.1	5.9	5.3	4.6	5.7	5.0	4.3	5.1	4.7	4.1	5.5	5.0	4.4	c
FRA	4.8	4.6	4.2	5.5	5.1	4.6	4.9	4.7	4.3	5.9	5.1	4.3	5.2	4.9	4.4	6.5	5.8	5.0	6.0	5.3	4.5	6.0	5.5	4.9	6.0	5.4	4.8	a
GBR	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	5.6	5.1	4.5	5.5	5.0	4.4	a+b
HRV	4.7	4.5	4.1	5.4	5.0	4.5	4.9	4.6	4.2	5.1	4.4	3.8	5.1	4.8	4.3	5.8	5.2	4.5	4.9	4.3	3.7	4.4	4.0	3.6	5.4	4.9	4.3	a
HUN	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	5.6	5.1	4.5	6.0	5.4	4.8	a+b
IRL	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	5.6	5.1	4.5	6.0	5.4	4.8	a+b
LTU	4.6	4.3	4.0	4.8	4.4	4.0	5.0	4.8	4.4	5.4	4.7	4.0	5.3	5.0	4.5	6.1	5.5	4.7	5.4	4.7	4.1	5.3	4.8	4.3	5.7	5.1	4.5	a+b
LUX	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	6.0	5.5	4.9	6.0	5.4	4.8	a+b
LVA	5.2	4.9	4.5	5.5	5.1	4.6	4.9	4.7	4.3	5.3	4.6	3.9	5.2	4.9	4.4	6.5	5.8	5.0	6.0	5.3	4.5	5.6	5.1	4.5	6.0	5.4	4.8	a+b
NLD	4.7	4.5	4.1	5.2	4.8	4.3	5.1	4.9	4.5	5.4	4.7	4.0	5.3	5.0	4.5	6.1	5.4	4.7	5.2	4.6	4.0	5.2	4.8	4.2	5.1	4.6	4.1	b
NOR	4.9	4.7	4.3	5.6	5.2	4.7	5.0	4.8	4.4	5.4	4.7	4.0	5.3	5.0	4.5	6.1	5.4	4.7	5.2	4.6	4.0	5.7	5.2	4.6	5.7	5.1	4.5	b
PRT	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	6.0	5.3	4.5	5.6	5.1	4.5	6.0	5.4	4.8	a
SVK	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	5.6	5.1	4.5	6.0	5.4	4.8	a
SVN	5.2	4.9	4.5	5.9	5.5	4.9	5.3	5.0	4.6	5.9	5.1	4.3	5.6	5.3	4.8	6.5	5.8	5.0	5.7	5.0	4.3	5.6	5.1	4.5	6.0	5.4	4.8	a
SWE	4.9	4.7	4.3	5.2	4.8	4.3	4.7	4.4	4.1	5.1	4.5	3.8	4.9	4.6	4.1	5.9	5.3	4.6	5.2	4.6	4.0	5.2	4.8	4.2	5.7	5.1	4.5	b
CEN	***4.8***	***4.6***	***4.2***	***5.5***	***5.1***	***4.6***	***4.9***	***4.7***	***4.3***	***5.3***	***4.6***	***3.9***	***5.2***	***4.9***	***4.4***	***5.9***	***5.3***	***4.6***	***5.1***	***4.5***	***3.8***	***5.1***	***4.7***	***4.1***	***5.5***	***5.0***	***4.4***	***a+b***
BEL	4.8	4.6	4.2	5.5	5.1	4.6	4.9	4.7	4.3	5.3	4.6	3.9	5.2	4.9	4.4	5.9	5.3	4.6	5.1	4.5	3.8	5.6	5.1	4.5	5.5	5.0	4.4	a+b
CZE	4.4	4.2	3.8	5.1	4.7	4.2	4.9	4.7	4.3	5.3	4.6	3.9	5.2	4.9	4.4	5.9	5.3	4.6	5.1	4.5	3.8	5.6	5.1	4.5	5.5	5.0	4.4	a+b
GBR	5.0	4.7	4.4	5.7	5.3	4.7	5.1	4.9	4.5	5.6	4.8	4.1	5.4	5.1	4.6	6.2	5.6	4.8	5.4	4.8	4.1	5.3	4.9	4.3	5.3	4.8	4.2	a+b
HUN	4.8	4.6	4.2	5.5	5.1	4.6	4.9	4.7	4.3	5.3	4.6	3.9	5.2	4.9	4.4	5.9	5.3	4.6	5.1	4.5	3.8	5.1	4.7	4.1	5.5	5.0	4.4	a+b
IRL	4.8	4.6	4.2	5.5	5.1	4.6	4.9	4.7	4.3	5.3	4.6	3.9	5.2	4.9	4.4	5.9	5.3	4.6	5.1	4.5	3.8	5.1	4.7	4.1	5.5	5.0	4.4	a+b
LTU	4.2	3.9	3.6	4.3	3.9	3.5	4.6	4.4	4.0	4.8	4.2	3.5	4.9	4.6	4.1	5.5	5.0	4.3	4.7	4.1	3.6	4.8	4.4	3.9	5.1	4.6	4.1	a+b
LUX	4.8	4.6	4.2	5.5	5.1	4.6	4.9	4.7	4.3	5.3	4.6	3.9	5.2	4.9	4.4	5.9	5.3	4.6	5.1	4.5	3.8	5.6	5.1	4.5	5.5	5.0	4.4	a+b
LVA	4.8	4.6	4.2	5.1	4.7	4.2	4.6	4.3	4.0	4.6	4.0	3.4	4.8	4.5	4.0	5.9	5.3	4.6	5.4	4.7	4.1	5.1	4.7	4.1	5.5	5.0	4.4	a+b

Table 15 - Reliability levels (**%**) relative to CEN target values for three different values of the coefficient of variation $V_{\theta R}$, considering uniformly distributed imposed loads for categories A to D2 – **reinforced concrete beam**

MS/cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
$V_{\theta R}$	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	
CEN	***36.2***	***29.4***	***19.1***	***56.4***	***44.9***	***29.5***	***39.4***	***32.4***	***21.7***	***54.3***	***33.7***	***12.9***	***47.3***	***38.2***	***25.2***	***50.2***	***34.7***	***16.5***	***32.5***	***16.8***	***-0.1***	***46.7***	***34.7***	***19.5***	***58.2***	***43.3***	***25.3***	***a+b***
BEL	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	58.4	45.6	29.3	58.2	43.3	25.3	a+b
BGR	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	57.5	39.1	19.0	46.7	34.7	19.5	58.2	43.3	25.3	a
CYP	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	58.4	45.6	29.3	58.2	43.3	25.3	a
CZE	26.7	20.1	10.4	45.6	34.7	20.2	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	58.4	45.6	29.3	58.2	43.3	25.3	a+b
DNK	27.6	20.6	10.6	47.2	35.8	21.0	32.6	25.2	14.7	51.8	31.5	11.1	52.8	42.9	29.2	49.8	33.9	15.9	24.9	10.1	-5.8	62.5	49.1	32.2	60.7	45.2	26.9	c
FIN	26.7	20.1	10.4	33.8	23.5	10.1	20.1	13.6	4.1	22.4	6.1	-10.3	26.3	18.0	6.6	38.2	23.7	7.0	32.5	16.8	-0.1	33.8	22.7	8.7	45.6	31.7	15.1	c
FRA	26.7	20.1	10.4	45.6	34.7	20.2	30.2	23.4	13.3	54.3	33.7	12.9	37.3	28.6	16.3	50.2	34.7	16.5	39.1	22.8	5.0	58.4	45.6	29.3	58.2	43.3	25.3	a
GBR	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	46.7	34.7	19.5	45.6	31.7	15.1	a+b
HRV	24.2	17.7	8.1	42.7	32.0	17.8	27.8	21.1	11.1	35.1	17.0	-1.2	34.7	26.0	13.9	35.0	20.8	4.5	14.2	0.6	-13.9	15.7	5.8	-6.3	42.2	28.6	12.4	a
HUN	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	46.7	34.7	19.5	58.2	43.3	25.3	a+b
IRL	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	46.7	34.7	19.5	58.2	43.3	25.3	a+b
LTU	20.5	14.1	4.8	26.9	17.1	4.3	32.1	25.3	15.1	43.3	24.2	4.8	39.4	30.6	18.1	41.9	27.0	10.0	25.0	10.2	-5.7	39.2	27.6	13.1	49.1	34.9	17.9	a+b
LUX	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	58.4	45.6	29.3	58.2	43.3	25.3	a+b
LVA	36.2	29.4	19.1	45.6	34.7	20.2	30.2	23.4	13.3	39.1	20.5	1.8	37.3	28.6	16.3	50.2	34.7	16.5	39.1	22.8	5.0	46.7	34.7	19.5	58.2	43.3	25.3	a+b
NLD	24.2	17.7	8.2	36.9	26.5	12.8	35.0	28.1	17.7	43.1	24.0	4.7	40.0	31.2	18.6	41.4	26.6	9.6	21.9	7.5	-8.1	37.3	25.9	11.6	35.4	22.3	6.9	b
NOR	29.2	22.6	12.7	48.4	37.4	22.7	32.7	25.8	15.5	43.1	24.0	4.7	40.0	31.2	18.6	41.4	26.6	9.6	21.9	7.5	-8.1	49.8	37.6	22.1	49.0	34.8	17.8	b
PRT	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	39.1	22.8	5.0	46.7	34.7	19.5	58.2	43.3	25.3	a
SVK	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	46.7	34.7	19.5	58.2	43.3	25.3	a
SVN	36.2	29.4	19.1	56.4	44.9	29.5	39.4	32.4	21.7	54.3	33.7	12.9	47.3	38.2	25.2	50.2	34.7	16.5	32.5	16.8	-0.1	46.7	34.7	19.5	58.2	43.3	25.3	a
SWE	29.2	22.6	12.7	36.9	26.5	12.8	22.8	16.2	6.6	35.2	17.1	-1.1	29.3	20.8	9.2	38.3	23.8	7.1	21.9	7.5	-8.1	37.3	25.9	11.6	49.0	34.8	17.8	b
CEN	***26.5***	***20.0***	***10.3***	***45.4***	***34.5***	***20.1***	***30.1***	***23.3***	***13.2***	***38.9***	***20.3***	***1.6***	***37.2***	***28.5***	***16.2***	***38.1***	***23.5***	***6.9***	***17.9***	***3.9***	***-11.1***	***33.7***	***22.5***	***8.6***	***45.4***	***31.5***	***15.0***	***a+b***
BEL	26.5	20.0	10.3	45.4	34.5	20.1	30.1	23.3	13.2	38.9	20.3	1.6	37.2	28.5	16.2	38.1	23.5	6.9	17.9	3.9	-11.1	46.6	34.5	19.3	45.4	31.5	15.0	a+b
CZE	16.1	9.8	0.8	33.6	23.3	10.0	30.1	23.3	13.2	38.9	20.3	1.6	37.2	28.5	16.2	38.1	23.5	6.9	17.9	3.9	-11.1	46.6	34.5	19.3	45.4	31.5	15.0	a+b
GBR	31.5	24.8	14.8	51.0	39.8	24.9	34.8	27.9	17.5	46.8	27.2	7.4	42.4	33.5	20.8	44.3	29.2	11.8	25.3	10.5	-5.4	40.4	28.7	14.1	38.7	25.4	9.6	a+b
HUN	26.5	20.0	10.3	45.4	34.5	20.1	30.1	23.3	13.2	38.9	20.3	1.6	37.2	28.5	16.2	38.1	23.5	6.9	17.9	3.9	-11.1	33.7	22.5	8.6	45.4	31.5	15.0	a+b
IRL	26.5	20.0	10.3	45.4	34.5	20.1	30.1	23.3	13.2	38.9	20.3	1.6	37.2	28.5	16.2	38.1	23.5	6.9	17.9	3.9	-11.1	33.7	22.5	8.6	45.4	31.5	15.0	a+b
LTU	9.2	3.2	-5.4	12.9	3.8	-7.6	22.1	15.5	5.9	26.8	9.9	-7.2	28.5	20.1	8.5	29.0	15.3	-0.2	9.5	-3.5	-17.4	25.3	14.7	1.6	35.4	22.3	6.9	a+b
LUX	26.5	20.0	10.3	45.4	34.5	20.1	30.1	23.3	13.2	38.9	20.3	1.6	37.2	28.5	16.2	38.1	23.5	6.9	17.9	3.9	-11.1	46.6	34.5	19.3	45.4	31.5	15.0	a+b
LVA	26.5	20.0	10.3	33.6	23.3	10.0	20.0	13.5	4.0	22.2	5.9	-10.5	26.2	17.9	6.4	38.1	23.5	6.9	25.3	10.4	-5.5	33.7	22.5	8.6	45.4	31.5	15.0	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 16 - Reliability levels for three different values of the coefficient of variation $V_{\theta R}$, considering uniformly distributed imposed loads for categories A to D2 – **reinforced concrete column**

MS/cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
$V_{\theta R}$	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	
CEN	***5.4***	***5.3***	***5.0***	***6.0***	***5.8***	***5.5***	***5.5***	***5.4***	***5.1***	***5.7***	***5.3***	***4.9***	***5.8***	***5.6***	***5.3***	***6.3***	***5.9***	***5.6***	***5.6***	***5.3***	***4.9***	***5.7***	***5.4***	***5.1***	***6.0***	***5.7***	***5.3***	***a+b***
BEL	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	6.1	5.8	5.4	6.0	5.7	5.3	a+b
BGR	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	6.4	6.1	5.7	5.7	5.4	5.1	6.0	5.7	5.3	a
CYP	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	6.1	5.8	5.4	6.0	5.7	5.3	a
CZE	5.1	4.9	4.7	5.7	5.4	5.1	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	6.1	5.8	5.4	6.0	5.7	5.3	a+b
DNK	4.4	4.2	4.0	4.9	4.7	4.4	4.6	4.4	4.2	4.8	4.5	4.1	5.1	4.9	4.6	5.5	5.2	4.8	4.7	4.4	4.0	5.3	5.1	4.7	5.2	4.9	4.6	c
FIN	5.1	4.9	4.7	5.3	5.0	4.7	4.9	4.7	4.5	4.7	4.4	4.0	5.1	4.9	4.6	5.9	5.5	5.2	5.6	5.3	4.9	5.3	5.0	4.7	5.6	5.3	4.9	c
FRA	5.1	4.9	4.7	5.7	5.4	5.1	5.2	5.1	4.8	5.7	5.3	4.9	5.4	5.2	5.0	6.3	5.9	5.6	5.8	5.5	5.1	6.1	5.8	5.4	6.0	5.7	5.3	a
GBR	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	5.7	5.4	5.1	5.6	5.3	4.9	a+b
HRV	5.0	4.9	4.6	5.6	5.3	5.0	5.1	5.0	4.8	5.1	4.8	4.4	5.3	5.1	4.9	5.8	5.4	5.1	5.0	4.7	4.3	4.7	4.4	4.1	5.5	5.2	4.8	a
HUN	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	5.7	5.4	5.1	6.0	5.7	5.3	a+b
IRL	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	5.7	5.4	5.1	6.0	5.7	5.3	a+b
LTU	4.9	4.7	4.5	5.1	4.8	4.5	5.3	5.1	4.9	5.3	5.0	4.6	5.5	5.3	5.0	6.0	5.7	5.3	5.4	5.0	4.6	5.4	5.2	4.9	5.7	5.4	5.0	a+b
LUX	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	6.1	5.8	5.4	6.0	5.7	5.3	a+b
LVA	5.4	5.3	5.0	5.7	5.4	5.1	5.2	5.1	4.8	5.2	4.9	4.5	5.4	5.2	5.0	6.3	5.9	5.6	5.8	5.5	5.1	5.7	5.4	5.1	6.0	5.7	5.3	a+b
NLD	5.0	4.9	4.6	5.4	5.1	4.8	5.4	5.2	5.0	5.3	5.0	4.6	5.5	5.3	5.0	6.0	5.6	5.3	5.3	4.9	4.6	5.4	5.1	4.8	5.3	5.0	4.6	b
NOR	5.2	5.0	4.8	5.8	5.5	5.2	5.3	5.1	4.9	5.3	5.0	4.6	5.5	5.3	5.0	6.0	5.6	5.3	5.3	4.9	4.6	5.8	5.5	5.2	5.7	5.4	5.0	b
PRT	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.8	5.5	5.1	5.7	5.4	5.1	6.0	5.7	5.3	a
SVK	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	5.7	5.4	5.1	6.0	5.7	5.3	a
SVN	5.4	5.3	5.0	6.0	5.8	5.5	5.5	5.4	5.1	5.7	5.3	4.9	5.8	5.6	5.3	6.3	5.9	5.6	5.6	5.3	4.9	5.7	5.4	5.1	6.0	5.7	5.3	a
SWE	5.2	5.0	4.8	5.4	5.1	4.8	5.0	4.8	4.6	5.1	4.8	4.4	5.2	5.0	4.7	5.9	5.5	5.2	5.3	4.9	4.6	5.4	5.1	4.8	5.7	5.4	5.0	b
CEN	***5.1***	***4.9***	***4.7***	***5.7***	***5.4***	***5.1***	***5.2***	***5.1***	***4.8***	***5.2***	***4.9***	***4.5***	***5.4***	***5.2***	***5.0***	***5.9***	***5.5***	***5.2***	***5.1***	***4.8***	***4.4***	***5.3***	***5.0***	***4.7***	***5.6***	***5.3***	***4.9***	**a+b**
BEL	5.1	4.9	4.7	5.7	5.4	5.1	5.2	5.1	4.8	5.2	4.9	4.5	5.4	5.2	5.0	5.9	5.5	5.2	5.1	4.8	4.4	5.7	5.4	5.1	5.6	5.3	4.9	a+b
CZE	4.8	4.6	4.4	5.3	5.0	4.7	5.2	5.1	4.8	5.2	4.9	4.5	5.4	5.2	5.0	5.9	5.5	5.2	5.1	4.8	4.4	5.7	5.4	5.1	5.6	5.3	4.9	a+b
GBR	5.3	5.1	4.9	5.8	5.6	5.3	5.4	5.2	5.0	5.4	5.1	4.7	5.6	5.4	5.1	6.1	5.7	5.4	5.4	5.0	4.7	5.5	5.2	4.9	5.4	5.1	4.7	a+b
HUN	5.1	4.9	4.7	5.7	5.4	5.1	5.2	5.1	4.8	5.2	4.9	4.5	5.4	5.2	5.0	5.9	5.5	5.2	5.1	4.8	4.4	5.3	5.0	4.7	5.6	5.3	4.9	a+b
IRL	5.1	4.9	4.7	5.7	5.4	5.1	5.2	5.1	4.8	5.2	4.9	4.5	5.4	5.2	5.0	5.9	5.5	5.2	5.1	4.8	4.4	5.3	5.0	4.7	5.6	5.3	4.9	a+b
LTU	4.5	4.4	4.1	4.6	4.4	4.1	5.0	4.8	4.6	4.9	4.5	4.2	5.1	4.9	4.7	5.5	5.2	4.9	4.8	4.5	4.2	5.0	4.7	4.4	5.3	5.0	4.6	a+b
LUX	5.1	4.9	4.7	5.7	5.4	5.1	5.2	5.1	4.8	5.2	4.9	4.5	5.4	5.2	5.0	5.9	5.5	5.2	5.1	4.8	4.4	5.7	5.4	5.1	5.6	5.3	4.9	a+b
LVA	5.1	4.9	4.7	5.3	5.0	4.7	4.9	4.7	4.5	4.7	4.4	4.0	5.1	4.9	4.6	5.9	5.5	5.2	5.4	5.0	4.7	5.3	5.0	4.7	5.6	5.3	4.9	a+b

Table 17 - Reliability levels (**%**) relative to CEN target values for three different values of the coefficient of variation $V_{\theta R}$, considering uniformly distributed imposed loads for categories A to D2 – **reinforced concrete column**

MS/cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
$V_{\theta R}$	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	0.05	0.10	0.15	
CEN	***43.0***	***38.5***	***32.7***	***58.3***	***51.7***	***43.6***	***45.8***	***41.3***	***35.4***	***48.9***	***39.1***	***28.2***	***51.8***	***46.3***	***39.2***	***46.0***	***38.1***	***29.1***	***30.5***	***22.4***	***13.4***	***49.4***	***42.3***	***33.9***	***57.3***	***49.2***	***39.8***	***a+b***
BEL	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	59.2	52.0	43.4	57.3	49.2	39.8	a+b
BGR	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	49.7	41.2	31.5	49.4	42.3	33.9	57.3	49.2	39.8	a
CYP	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	59.2	52.0	43.4	57.3	49.2	39.8	a
CZE	34.5	30.0	24.2	49.1	42.6	34.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	59.2	52.0	43.4	57.3	49.2	39.8	a+b
DNK	33.7	28.8	22.3	48.8	41.7	33.0	38.1	33.0	26.4	45.6	35.4	24.0	55.0	48.7	40.8	44.0	35.7	26.1	22.8	14.7	5.5	61.1	53.2	43.8	57.8	49.1	38.9	c
FIN	34.5	30.0	24.2	39.0	32.6	24.9	28.6	24.1	18.3	24.9	16.1	6.2	33.4	28.0	21.2	36.4	28.8	20.1	30.5	22.4	13.4	38.5	31.7	23.6	46.9	39.1	30.0	c
FRA	34.5	30.0	24.2	49.1	42.6	34.6	37.6	33.1	27.2	48.9	39.1	28.2	43.1	37.6	30.6	46.0	38.1	29.1	35.6	27.5	18.3	59.2	52.0	43.4	57.3	49.2	39.8	a
GBR	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	49.4	42.3	33.9	46.9	39.1	30.0	a+b
HRV	32.3	27.8	22.0	46.7	40.2	32.3	35.4	30.9	25.0	34.5	25.2	14.9	40.7	35.3	28.3	33.9	26.3	17.7	16.2	8.7	0.3	23.2	16.8	9.1	44.2	36.5	27.4	a
HUN	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	49.4	42.3	33.9	57.3	49.2	39.8	a+b
IRL	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	49.4	42.3	33.9	57.3	49.2	39.8	a+b
LTU	29.0	24.6	18.8	33.2	26.9	19.3	39.3	34.8	28.9	40.7	31.1	20.6	44.9	39.4	32.4	39.4	31.7	22.9	24.6	16.8	8.0	43.0	36.1	27.8	49.8	41.9	32.7	a+b
LUX	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	59.2	52.0	43.4	57.3	49.2	39.8	a+b
LVA	43.0	38.5	32.7	49.1	42.6	34.6	37.6	33.1	27.2	37.5	28.1	17.7	43.1	37.6	30.6	46.0	38.1	29.1	35.6	27.5	18.3	49.4	42.3	33.9	57.3	49.2	39.8	a+b
NLD	32.3	27.9	22.1	41.7	35.3	27.5	41.9	37.3	31.4	40.6	31.0	20.5	45.4	39.9	32.9	39.0	31.3	22.5	22.3	14.5	5.8	41.4	34.5	26.3	38.6	31.0	22.2	b
NOR	36.8	32.3	26.5	51.5	45.0	37.0	39.8	35.3	29.4	40.6	31.0	20.5	45.4	39.9	32.9	39.0	31.3	22.5	22.3	14.5	5.8	52.0	44.9	36.5	49.7	41.8	32.6	b
PRT	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	35.6	27.5	18.3	49.4	42.3	33.9	57.3	49.2	39.8	a
SVK	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	49.4	42.3	33.9	57.3	49.2	39.8	a
SVN	43.0	38.5	32.7	58.3	51.7	43.6	45.8	41.3	35.4	48.9	39.1	28.2	51.8	46.3	39.2	46.0	38.1	29.1	30.5	22.4	13.4	49.4	42.3	33.9	57.3	49.2	39.8	a
SWE	36.8	32.3	26.5	41.7	35.3	27.5	31.0	26.5	20.6	34.6	25.3	15.0	36.0	30.6	23.7	36.5	28.9	20.2	22.3	14.5	5.8	41.4	34.5	26.3	49.7	41.8	32.6	b
CEN	***34.4***	***29.9***	***24.1***	***49.0***	***42.5***	***34.5***	***37.5***	***33.0***	***27.1***	***37.4***	***28.0***	***17.6***	***42.9***	***37.4***	***30.5***	***36.3***	***28.7***	***20.0***	***19.1***	***11.5***	***2.9***	***38.4***	***31.6***	***23.4***	***46.8***	***39.0***	***29.9***	***a+b***
BEL	34.4	29.9	24.1	49.0	42.5	34.5	37.5	33.0	27.1	37.4	28.0	17.6	42.9	37.4	30.5	36.3	28.7	20.0	19.1	11.5	2.9	49.2	42.2	33.8	46.8	39.0	29.9	a+b
CZE	25.0	20.6	14.9	38.8	32.5	24.7	37.5	33.0	27.1	37.4	28.0	17.6	42.9	37.4	30.5	36.3	28.7	20.0	19.1	11.5	2.9	49.2	42.2	33.8	46.8	39.0	29.9	a+b
GBR	38.8	34.3	28.5	53.7	47.2	39.1	41.8	37.2	31.3	43.3	33.7	23.0	47.5	42.0	34.9	41.3	33.5	24.7	24.9	17.1	8.3	44.0	37.1	28.8	41.3	33.7	24.7	a+b
HUN	34.4	29.9	24.1	49.0	42.5	34.5	37.5	33.0	27.1	37.4	28.0	17.6	42.9	37.4	30.5	36.3	28.7	20.0	19.1	11.5	2.9	38.4	31.6	23.4	46.8	39.0	29.9	a+b
IRL	34.4	29.9	24.1	49.0	42.5	34.5	37.5	33.0	27.1	37.4	28.0	17.6	42.9	37.4	30.5	36.3	28.7	20.0	19.1	11.5	2.9	38.4	31.6	23.4	46.8	39.0	29.9	a+b
LTU	18.9	14.5	8.9	21.1	15.1	7.8	30.4	25.9	20.0	28.2	19.2	9.3	35.3	29.9	23.0	29.0	21.6	13.1	12.6	5.2	-3.1	31.3	24.6	16.7	38.6	31.0	22.1	a+b
LUX	34.4	29.9	24.1	49.0	42.5	34.5	37.5	33.0	27.1	37.4	28.0	17.6	42.9	37.4	30.5	36.3	28.7	20.0	19.1	11.5	2.9	49.2	42.2	33.8	46.8	39.0	29.9	a+b
LVA	34.4	29.9	24.1	38.8	32.5	24.7	28.5	24.0	18.1	24.7	15.9	6.1	33.3	27.9	21.0	36.3	28.7	20.0	24.9	17.0	8.2	38.4	31.6	23.4	46.8	39.0	29.9	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

4.4 Reliability levels for common load ranges

The minimum and maximum values of reliability indices are analysed for selected structural members made of different materials and for the selected categories of imposed loads. The values of reliability index β for the typical load ratio χ= 0.4, indicated as $\beta_{/\chi=0.4}$, are also given for all structural members and materials.

In general, the minimum values of reliability indices could be found for a load ratio χ approaching 1 (prevailing variable loads), that is in practice rather non-realistic. Therefore, the lower bound of the load ratio is considered here as χ = 0 (prevailing permanent loads) and the upper bound of the parameter as χ = 0.7. In case the *procedure c* is adopted for the combination of actions*, i.e.,* when the expressions (6.10a$_{mod.}$, 6.10b) are chosen, the minimum value is often found in the intersection of these twin expressions (see figures in chapter 6).

The reliability indices obtained for a **reinforced concrete beam** are given in Table 18 considering the categories of imposed loads A to D2. The results show that for the load ratio χ = 0.4 almost all countries and categories of loaded areas obtained reliability levels equal or above the CEN recommended value. An exception is found for Lithuania, for the category of use C5, when using *procedure b* for the combination of actions. The most frequent exceptions found for β_{min} are in the category of use C5, when *procedure b* is chosen, since most MS and CEN do not meet the target reliability level β_t = 4.3 (reliability category RC3). In this case, the largest relative difference, in percentage terms, to the target reliability level is achieved by Lithuania, *i.e.,* -15%, whereas the CEN value is 5% below the recommended reliability level (see Table 28). Notice that β_{min} is mainly achieved at the threshold values of the load ratios analysed, mostly for χ = 0.7, but also for χ = 0.0 (see Table 37). The minimum reliability level, β_{min}, obtained by Croatia is lower than the CEN recommended value β_t for all categories of imposed loads. The main particularity in the national choices of NDPs made by Croatia is in the value of the partial factor for permanent actions, *i.e.*, Croatia adopted a value for γ_G = 1.1, whereas most Member States have chosen the value recommended by CEN, *i.e.*, γ_G = 1.35.

For a **reinforced concrete column** (Table 19) results show that, for the load ratio χ = 0.4, almost all countries and categories of loaded areas obtained reliability levels equal or above the CEN recommended levels for the reliability categories RC2 and RC3. For β_{min}, one exception was found for Lithuania in the category of use C5 that did not meet the target reliability level β_t = 4.3 for the combination *procedure b,* showing a maximum relative difference to the target value of -4% (see Table 29).

Table 18 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio χ **= 0.4**, considering the categories of imposed loads A to D2 – **reinforced concrete beam**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***4.2***	***4.9***	***5.3***	***4.6***	***5.5***	***5.6***	***4.3***	***5.0***	***5.3***	***4.6***	***5.1***	***5.1***	***4.6***	***5.3***	***5.4***	***5.1***	***5.8***	***5.8***	***4.3***	***5.0***	***5.2***	***4.4***	***5.1***	***5.2***	***4.6***	***5.4***	***5.5***	**a+b**
BEL	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.6	5.5	5.6	4.6	5.4	5.5	a+b
BGR	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	5.1	6.0	6.0	4.4	5.1	5.2	4.6	5.4	5.5	a
CYP	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.6	5.5	5.6	4.6	5.4	5.5	a
CZE	3.8	4.6	5.0	4.4	5.1	5.2	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.6	5.5	5.6	4.6	5.4	5.5	a+b
DNK	3.6	4.0	4.1	3.7	4.5	4.5	3.7	4.1	4.2	3.4	4.3	4.8	3.7	4.7	4.7	4.1	5.1	5.2	3.8	4.2	4.6	3.7	4.9	5.0	3.6	4.8	4.9	c
FIN	4.1	4.6	4.7	4.2	4.7	4.7	3.8	4.3	4.6	3.8	4.0	4.6	4.0	4.5	4.6	4.7	5.3	5.3	4.5	5.0	5.1	4.1	4.7	4.7	4.2	5.0	5.0	c
FRA	3.8	4.6	5.0	4.4	5.1	5.2	3.9	4.7	5.1	4.6	5.1	5.1	4.1	4.9	5.1	5.1	5.8	5.8	4.7	5.3	5.3	4.6	5.5	5.6	4.6	5.4	5.5	a
GBR	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.4	5.1	5.2	4.4	5.0	5.1	a+b
HRV	3.4	4.5	4.5	3.4	5.0	5.0	3.4	4.6	4.7	3.4	4.4	4.7	3.4	4.8	4.8	4.0	5.2	5.2	4.0	4.3	4.3	3.4	4.0	4.0	3.4	4.9	4.9	a
HUN	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.4	5.1	5.2	4.6	5.4	5.5	a+b
IRL	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.4	5.1	5.2	4.6	5.4	5.5	a+b
LTU	3.5	4.3	4.9	3.6	4.4	4.8	4.0	4.8	5.1	4.4	4.7	4.7	4.2	5.0	5.2	4.8	5.5	5.5	3.9	4.7	5.1	4.1	4.8	5.0	4.5	5.1	5.2	a+b
LUX	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.6	5.5	5.6	4.6	5.4	5.5	a+b
LVA	4.2	4.9	5.3	4.4	5.1	5.2	3.9	4.7	5.1	4.2	4.6	4.6	4.1	4.9	5.1	5.1	5.8	5.8	4.7	5.3	5.3	4.4	5.1	5.2	4.6	5.4	5.5	a+b
NLD	3.9	4.5	4.7	4.3	4.8	4.8	4.3	4.9	5.0	4.2	4.7	4.8	4.5	5.0	5.0	4.9	5.4	5.4	4.2	4.6	5.1	4.3	4.8	4.8	4.3	4.6	4.7	b
NOR	4.1	4.7	4.8	4.6	5.2	5.2	4.3	4.8	4.9	4.4	4.7	4.8	4.5	5.0	5.0	5.1	5.4	5.4	4.2	4.6	5.1	4.6	5.2	5.2	4.6	5.1	5.1	b
PRT	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.7	5.3	5.3	4.4	5.1	5.2	4.6	5.4	5.5	a
SVK	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.4	5.1	5.2	4.6	5.4	5.5	a
SVN	4.2	4.9	5.3	4.6	5.5	5.6	4.3	5.0	5.3	4.6	5.1	5.1	4.6	5.3	5.4	5.1	5.8	5.8	4.3	5.0	5.2	4.4	5.1	5.2	4.6	5.4	5.5	a
SWE	4.1	4.7	4.8	4.3	4.8	4.8	3.9	4.4	4.7	4.3	4.5	4.6	4.0	4.6	4.7	4.9	5.3	5.3	4.2	4.6	5.1	4.3	4.8	4.8	4.6	5.1	5.1	b
CEN	***4.1***	***4.6***	***4.8***	***4.6***	***5.1***	***5.1***	***4.2***	***4.7***	***4.9***	***4.4***	***4.6***	***4.8***	***4.4***	***4.9***	***4.9***	***5.0***	***5.3***	***5.3***	***4.1***	***4.5***	***5.1***	***4.3***	***4.7***	***4.8***	***4.6***	***5.0***	***5.0***	**a+b**
BEL	4.1	4.6	4.8	4.6	5.1	5.1	4.2	4.7	4.9	4.4	4.6	4.8	4.4	4.9	4.9	5.0	5.3	5.3	4.1	4.5	5.1	4.6	5.1	5.1	4.6	5.0	5.0	a+b
CZE	3.6	4.2	4.7	4.3	4.7	4.8	4.2	4.7	4.9	4.4	4.6	4.8	4.4	4.9	4.9	5.0	5.3	5.3	4.1	4.5	5.1	4.6	5.1	5.1	4.6	5.0	5.0	a+b
GBR	4.1	4.7	5.0	4.6	5.3	5.3	4.3	4.9	5.1	4.5	4.8	4.9	4.5	5.1	5.2	5.1	5.6	5.6	4.2	4.8	5.1	4.3	4.9	4.9	4.3	4.8	4.8	a+b
HUN	4.1	4.6	4.8	4.6	5.1	5.1	4.2	4.7	4.9	4.4	4.6	4.8	4.4	4.9	4.9	5.0	5.3	5.3	4.1	4.5	5.1	4.3	4.7	4.8	4.6	5.0	5.0	a+b
IRL	4.1	4.6	4.8	4.6	5.1	5.1	4.2	4.7	4.9	4.4	4.6	4.8	4.4	4.9	4.9	5.0	5.3	5.3	4.1	4.5	5.1	4.3	4.7	4.8	4.6	5.0	5.0	a+b
LTU	3.4	3.9	4.6	3.4	3.9	4.6	3.9	4.4	4.8	4.1	4.2	4.6	4.1	4.6	4.8	4.6	5.0	5.1	3.6	4.1	5.1	3.9	4.4	4.7	4.4	4.6	4.7	a+b
LUX	4.1	4.6	4.8	4.6	5.1	5.1	4.2	4.7	4.9	4.4	4.6	4.8	4.4	4.9	4.9	5.0	5.3	5.3	4.1	4.5	5.1	4.6	5.1	5.1	4.6	5.0	5.0	a+b
LVA	4.1	4.6	4.8	4.3	4.7	4.8	3.8	4.3	4.7	4.0	4.0	4.6	4.0	4.5	4.7	5.0	5.3	5.3	4.5	4.7	5.1	4.3	4.7	4.8	4.6	5.0	5.0	a+b

Table 19 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio **χ = 0.4,** considering the categories of imposed loads A to D2 – **reinforced concrete column**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***4.6***	***5.3***	***5.5***	***4.9***	***5.8***	***5.8***	***4.7***	***5.4***	***5.6***	***4.9***	***5.3***	***5.3***	***4.9***	***5.6***	***5.6***	***5.3***	***5.9***	***5.9***	***4.7***	***5.3***	***5.4***	***4.8***	***5.4***	***5.4***	***4.9***	***5.7***	***5.7***	**a+b**
BEL	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.9	5.8	5.8	4.9	5.7	5.7	a+b
BGR	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	5.3	6.1	6.1	4.8	5.4	5.4	4.9	5.7	5.7	a
CYP	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.9	5.8	5.8	4.9	5.7	5.7	a
CZE	4.2	4.9	5.2	4.8	5.4	5.5	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.9	5.8	5.8	4.9	5.7	5.7	a+b
DNK	3.9	4.2	4.3	3.9	4.7	4.7	3.9	4.4	4.4	3.7	4.5	4.9	3.9	4.9	4.9	4.3	5.2	5.3	4.0	4.4	4.7	4.0	5.1	5.1	3.9	4.9	5.1	c
FIN	4.4	4.9	5.0	4.5	5.0	5.0	4.2	4.7	4.9	4.2	4.4	4.9	4.4	4.9	4.9	4.9	5.5	5.6	4.8	5.3	5.3	4.5	5.0	5.0	4.5	5.3	5.3	c
FRA	4.2	4.9	5.2	4.8	5.4	5.5	4.3	5.1	5.3	4.9	5.3	5.3	4.5	5.2	5.4	5.3	5.9	5.9	5.1	5.5	5.5	4.9	5.8	5.8	4.9	5.7	5.7	a
GBR	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.8	5.4	5.4	4.8	5.3	5.3	a+b
HRV	3.9	4.9	4.9	3.9	5.3	5.3	3.9	5.0	5.0	3.9	4.8	5.1	3.9	5.1	5.1	4.3	5.4	5.5	4.3	4.7	4.7	3.9	4.4	4.4	3.9	5.2	5.3	a
HUN	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.8	5.4	5.4	4.9	5.7	5.7	a+b
IRL	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.8	5.4	5.4	4.9	5.7	5.7	a+b
LTU	3.9	4.7	5.1	4.0	4.8	5.0	4.4	5.1	5.4	4.8	5.0	5.0	4.6	5.3	5.4	5.2	5.7	5.7	4.3	5.0	5.3	4.5	5.2	5.2	4.9	5.4	5.4	a+b
LUX	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.9	5.8	5.8	4.9	5.7	5.7	a+b
LVA	4.6	5.3	5.5	4.8	5.4	5.5	4.3	5.1	5.3	4.6	4.9	4.9	4.5	5.2	5.4	5.3	5.9	5.9	5.1	5.5	5.5	4.8	5.4	5.4	4.9	5.7	5.7	a+b
NLD	4.3	4.9	5.0	4.7	5.1	5.1	4.7	5.2	5.3	4.5	5.0	5.1	4.8	5.3	5.3	5.1	5.6	5.7	4.6	4.9	5.3	4.7	5.1	5.1	4.7	5.0	5.0	b
NOR	4.5	5.0	5.1	4.9	5.5	5.5	4.6	5.1	5.2	4.7	5.0	5.1	4.8	5.3	5.3	5.3	5.6	5.7	4.6	4.9	5.3	4.9	5.5	5.5	4.9	5.4	5.4	b
PRT	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	5.1	5.5	5.5	4.8	5.4	5.4	4.9	5.7	5.7	a
SVK	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.8	5.4	5.4	4.9	5.7	5.7	a
SVN	4.6	5.3	5.5	4.9	5.8	5.8	4.7	5.4	5.6	4.9	5.3	5.3	4.9	5.6	5.6	5.3	5.9	5.9	4.7	5.3	5.4	4.8	5.4	5.4	4.9	5.7	5.7	a
SWE	4.5	5.0	5.1	4.7	5.1	5.1	4.2	4.8	5.0	4.6	4.8	4.9	4.4	5.0	5.0	5.3	5.5	5.6	4.6	4.9	5.3	4.7	5.1	5.1	4.9	5.4	5.4	b
CEN	***4.4***	***4.9***	***5.1***	***4.9***	***5.4***	***5.4***	***4.6***	***5.1***	***5.1***	***4.7***	***4.9***	***5.1***	***4.8***	***5.2***	***5.2***	***5.3***	***5.5***	***5.6***	***4.5***	***4.8***	***5.3***	***4.6***	***5.0***	***5.0***	***4.9***	***5.3***	***5.3***	**a+b**
BEL	4.4	4.9	5.1	4.9	5.4	5.4	4.6	5.1	5.1	4.7	4.9	5.1	4.8	5.2	5.2	5.3	5.5	5.6	4.5	4.8	5.3	4.9	5.4	5.4	4.9	5.3	5.3	a+b
CZE	4.0	4.6	5.0	4.7	5.0	5.0	4.6	5.1	5.1	4.7	4.9	5.1	4.8	5.2	5.2	5.3	5.5	5.6	4.5	4.8	5.3	4.9	5.4	5.4	4.9	5.3	5.3	a+b
GBR	4.5	5.1	5.2	4.9	5.6	5.6	4.6	5.2	5.3	4.8	5.1	5.2	4.9	5.4	5.4	5.3	5.7	5.8	4.6	5.0	5.3	4.7	5.2	5.2	4.7	5.1	5.1	a+b
HUN	4.4	4.9	5.1	4.9	5.4	5.4	4.6	5.1	5.1	4.7	4.9	5.1	4.8	5.2	5.2	5.3	5.5	5.6	4.5	4.8	5.3	4.6	5.0	5.0	4.9	5.3	5.3	a+b
IRL	4.4	4.9	5.1	4.9	5.4	5.4	4.6	5.1	5.1	4.7	4.9	5.1	4.8	5.2	5.2	5.3	5.5	5.6	4.5	4.8	5.3	4.6	5.0	5.0	4.9	5.3	5.3	a+b
LTU	3.8	4.4	4.9	3.8	4.4	4.9	4.3	4.8	5.0	4.5	4.5	4.9	4.5	4.9	5.0	5.0	5.2	5.3	4.1	4.5	5.3	4.3	4.7	4.9	4.8	5.0	5.0	a+b
LUX	4.4	4.9	5.1	4.9	5.4	5.4	4.6	5.1	5.1	4.7	4.9	5.1	4.8	5.2	5.2	5.3	5.5	5.6	4.5	4.8	5.3	4.9	5.4	5.4	4.9	5.3	5.3	a+b
LVA	4.4	4.9	5.1	4.7	5.0	5.0	4.2	4.7	5.0	4.4	4.4	4.9	4.4	4.9	5.0	5.3	5.5	5.6	4.9	5.0	5.3	4.6	5.0	5.0	4.9	5.3	5.3	a+b

For a **reinforced concrete slab** (see Table 20), results show that for the load ratio χ = 0.4 the reliability levels are equal or above the CEN recommended value of β_t = 3.8 for most countries and categories of loaded areas. For the category of loaded areas C5, which are characteristic for construction works used for sport activities or congregation areas (reliability category RC3), the reliability level β_t = 4.3 is also achieved, except for β_{min} mainly when *procedure b* is adopted. The results are similar to the ones obtained for the reinforced concrete beam. In fact, Croatia did not meet the target reliability level for β_{min} for all categories of imposed loads and Lithuania did not achieve the recommended level for β_{min} for the categories of imposed loads A, B and C5, showing the lowest value of β_t, (-16%) for the category C5 and *procedure* b (see Table 30). A reinforced concrete slab, designed with CEN recommended values using *procedure b,* achieved a minimum reliability level 6% lower than the target (β_t = 4.3) for the category C5.

For a **composite steel concrete slab** (see Table 21), the results show that for many countries, the reliability level is below the CEN target value for the load ratio χ = 0.4, mainly for the categories of imposed loads A, C2 and C5 and when *procedure b* is chosen. For the category of imposed loads A, the reliability levels for most countries are less than 5% below the CEN target values. The only exceptions are Lithuania and the Check Republic, which achieved reliability levels that are 28% and 20% below the target, respectively. A composite steel concrete slab designed with *procedure b* according to CEN recommended values shows, at most, a reliability level 22% below the target (see Table 31). A large majority of countries and categories obtained a minimum reliability level β_{min} below the CEN recommended reliability level. For β_{min}, the lowest reliability value is achieved by Croatia (- 41%) for all categories with reliability RC2.

For a **steel tie** (see Table 22), the results show that that for many countries, the reliability level is below the CEN target value for the load ratio χ = 0.4, mainly for the categories of imposed loads A and C5, mainly when *procedure b* is chosen. The lowest value for the load ratio χ = 0.4 is achieved by Lithuania (- 23%) for category C5 and *procedure b*, whereas CEN shows a maximum relative difference of -12% for the same situation (see Table 32). On the contrary, Bulgaria, which applied the upper bound of the imposed load interval for category C5, and adopted a higher value than the RV in EN 1993-1-1 for the material partial factor, commonly achieved the CEN recommended reliability level. For most considered countries and categories of loaded areas the minimum reliability level β_{min} is below the CEN recommended reliability level. The situation is more frequent for the categories of imposed loads A, C1, C5 and D1. When interpreting the results for category A of imposed loads, it should be noted that the use of steel ties is not very common in residential buildings, so the estimated relatively low reliability of this structural member for category A is more a theoretical, than a practical case.

For a **steel column** (see Table 23), the results show that for the load ratio χ = 0.4, for the category of loaded area C5 and when *procedure b* is chosen, all countries and CEN do not achieve a reliability level below the CEN recommended. The maximum relative difference to the recommended target and load ratio χ = 0.4 is achieved by Lithuania for the category C5 and *procedure b*, with a value equal to -20%. CEN shows a maximum relative difference of -20% for category C5 and *procedure b* (see Table 33). With respect to $\beta_{min,}$ all MS and CEN do not meet the target reliability level β_t = 4.3 for the category of imposed loads C5. Exception is made for Bulgaria and Denmark that achieved the CEN recommended reliability for all categories of imposed loads. Croatia's level for β_{min} is lower than the CEN recommended value for all categories of imposed loads.

Table 20 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio **χ = 0.4,** considering the categories of imposed loads A to D2 – **reinforced concrete slab**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***4.2***	***4.9***	***5.2***	***4.5***	***5.4***	***5.5***	***4.3***	***5.0***	***5.3***	***4.5***	***5.0***	***5.0***	***4.5***	***5.2***	***5.3***	***5.1***	***5.7***	***5.7***	***4.3***	***4.9***	***5.1***	***4.4***	***5.1***	***5.1***	***4.5***	***5.4***	***5.4***	**<u>a</u>+b**
BEL	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.5	5.5	5.5	4.5	5.4	5.4	<u>a</u>+b
BGR	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	5.1	5.9	5.9	4.4	5.1	5.1	4.5	5.4	5.4	a
CYP	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.5	5.5	5.5	4.5	5.4	5.4	a
CZE	3.8	4.5	4.9	4.4	5.1	5.2	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.5	5.5	5.5	4.5	5.4	5.4	<u>a</u>+b
DNK	3.6	3.9	4.0	3.6	4.4	4.4	3.6	4.1	4.1	3.4	4.3	4.7	3.6	4.7	4.7	4.1	5.0	5.1	3.8	4.1	4.5	3.7	4.9	4.9	3.6	4.7	4.8	c
FIN	4.1	4.5	4.6	4.1	4.6	4.6	3.8	4.3	4.5	3.8	4.0	4.5	4.0	4.4	4.5	4.6	5.2	5.3	4.5	4.9	5.1	4.1	4.6	4.6	4.1	4.9	5.0	c
FRA	3.8	4.5	4.9	4.4	5.1	5.2	3.9	4.7	5.0	4.5	5.0	5.0	4.1	4.8	5.1	5.1	5.7	5.7	4.7	5.2	5.3	4.5	5.5	5.5	4.5	5.4	5.4	a
GBR	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.4	5.1	5.1	4.3	4.9	5.0	<u>a</u>+b
HRV	3.4	4.4	4.5	3.4	5.0	5.0	3.4	4.6	4.6	3.4	4.4	4.7	3.4	4.7	4.8	3.9	5.1	5.2	3.9	4.3	4.3	3.4	4.0	4.0	3.4	4.8	4.9	a
HUN	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.4	5.1	5.1	4.5	5.4	5.4	<u>a</u>+b
IRL	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.4	5.1	5.1	4.5	5.4	5.4	<u>a</u>+b
LTU	3.5	4.3	4.8	3.6	4.4	4.7	4.0	4.7	5.1	4.4	4.6	4.7	4.2	4.9	5.1	4.8	5.4	5.4	3.9	4.7	5.1	4.1	4.8	4.9	4.5	5.1	5.1	<u>a</u>+b
LUX	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.5	5.5	5.5	4.5	5.4	5.4	<u>a</u>+b
LVA	4.2	4.9	5.2	4.4	5.1	5.2	3.9	4.7	5.0	4.2	4.5	4.6	4.1	4.8	5.1	5.1	5.7	5.7	4.7	5.2	5.3	4.4	5.1	5.1	4.5	5.4	5.4	<u>a</u>+b
NLD	3.9	4.4	4.6	4.3	4.8	4.8	4.3	4.8	4.9	4.1	4.6	4.8	4.4	4.9	5.0	4.8	5.4	5.4	4.1	4.6	5.1	4.3	4.7	4.7	4.2	4.6	4.6	b
NOR	4.1	4.6	4.8	4.5	5.2	5.2	4.2	4.7	4.9	4.4	4.6	4.8	4.5	4.9	5.0	5.1	5.4	5.4	4.1	4.6	5.1	4.5	5.2	5.2	4.5	5.1	5.1	b
PRT	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.7	5.2	5.3	4.4	5.1	5.1	4.5	5.4	5.4	a
SVK	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.4	5.1	5.1	4.5	5.4	5.4	a
SVN	4.2	4.9	5.2	4.5	5.4	5.5	4.3	5.0	5.3	4.5	5.0	5.0	4.5	5.2	5.3	5.1	5.7	5.7	4.3	4.9	5.1	4.4	5.1	5.1	4.5	5.4	5.4	a
SWE	4.1	4.6	4.8	4.3	4.8	4.8	3.8	4.4	4.7	4.2	4.4	4.5	4.0	4.5	4.7	4.9	5.2	5.2	4.1	4.6	5.1	4.3	4.7	4.7	4.5	5.1	5.1	b
CEN	***4.1***	***4.5***	***4.8***	***4.5***	***5.1***	***5.1***	***4.2***	***4.6***	***4.8***	***4.3***	***4.5***	***4.7***	***4.4***	***4.8***	***4.9***	***5.0***	***5.2***	***5.3***	***4.1***	***4.4***	***5.1***	***4.2***	***4.6***	***4.7***	***4.5***	***4.9***	***5.0***	**a+<u>b</u>**
BEL	4.1	4.5	4.8	4.5	5.1	5.1	4.2	4.6	4.8	4.3	4.5	4.7	4.4	4.8	4.9	5.0	5.2	5.3	4.1	4.4	5.1	4.5	5.1	5.1	4.5	4.9	5.0	a+<u>b</u>
CZE	3.6	4.1	4.6	4.2	4.6	4.7	4.2	4.6	4.8	4.3	4.5	4.7	4.4	4.8	4.9	5.0	5.2	5.3	4.1	4.4	5.1	4.5	5.1	5.1	4.5	4.9	5.0	a+<u>b</u>
GBR	4.1	4.7	4.9	4.5	5.3	5.3	4.3	4.8	5.0	4.4	4.8	4.8	4.5	5.0	5.1	5.1	5.5	5.5	4.2	4.7	5.1	4.3	4.8	4.9	4.3	4.7	4.7	a+<u>b</u>
HUN	4.1	4.5	4.8	4.5	5.1	5.1	4.2	4.6	4.8	4.3	4.5	4.7	4.4	4.8	4.9	5.0	5.2	5.3	4.1	4.4	5.1	4.2	4.6	4.7	4.5	4.9	5.0	a+<u>b</u>
IRL	4.1	4.5	4.8	4.5	5.1	5.1	4.2	4.6	4.8	4.3	4.5	4.7	4.4	4.8	4.9	5.0	5.2	5.3	4.1	4.4	5.1	4.2	4.6	4.7	4.5	4.9	5.0	a+<u>b</u>
LTU	3.3	3.9	4.6	3.4	3.9	4.5	3.9	4.4	4.7	4.0	4.1	4.5	4.1	4.5	4.7	4.6	4.9	5.1	3.6	4.1	5.1	3.9	4.3	4.6	4.3	4.6	4.6	a+<u>b</u>
LUX	4.1	4.5	4.8	4.5	5.1	5.1	4.2	4.6	4.8	4.3	4.5	4.7	4.4	4.8	4.9	5.0	5.2	5.3	4.1	4.4	5.1	4.5	5.1	5.1	4.5	4.9	5.0	a+<u>b</u>
LVA	4.1	4.5	4.8	4.2	4.6	4.7	3.8	4.3	4.7	3.9	4.0	4.5	4.0	4.4	4.7	5.0	5.2	5.3	4.5	4.7	5.1	4.2	4.6	4.7	4.5	4.9	5.0	a+<u>b</u>

Table 21 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio χ **= 0.4,** considering the categories of imposed loads A to D2 – **composite steel concrete slab**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***3.5***	***4.1***	***4.3***	***3.5***	***4.6***	***4.6***	***3.5***	***4.2***	***4.3***	***3.5***	***4.0***	***4.0***	***3.5***	***4.4***	***4.4***	***4.1***	***4.8***	***4.8***	***3.4***	***4.0***	***4.1***	***3.5***	***4.2***	***4.2***	***3.5***	***4.5***	***4.5***	a+b
BEL	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.6	4.6	3.5	4.5	4.5	a+b
BGR	3.7	4.3	4.5	3.8	4.8	4.9	3.8	4.4	4.6	3.8	4.3	4.3	3.8	4.6	4.7	4.3	5.1	5.1	4.3	5.3	5.3	3.8	4.4	4.5	3.8	4.7	4.7	a
CYP	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.6	4.6	3.5	4.5	4.5	a
CZE	3.2	3.7	4.0	3.5	4.2	4.2	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.6	4.6	3.5	4.5	4.5	a+b
DNK	3.4	3.8	3.9	3.4	4.3	4.3	3.4	3.9	4.0	3.2	4.2	4.6	3.5	4.5	4.5	3.9	4.9	5.0	3.6	4.0	4.4	3.5	4.7	4.8	3.4	4.6	4.7	c
FIN	3.1	3.7	3.7	3.1	3.7	3.7	3.1	3.5	3.5	2.7	2.9	3.5	3.0	3.6	3.6	3.5	4.3	4.3	3.4	4.0	4.1	3.0	3.7	3.7	3.0	4.0	4.1	c
FRA	3.2	3.7	4.0	3.5	4.2	4.2	3.3	3.8	4.1	3.5	4.0	4.0	3.5	4.0	4.1	4.1	4.8	4.8	3.8	4.2	4.3	3.5	4.6	4.6	3.5	4.5	4.5	a
GBR	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.2	4.2	3.5	4.0	4.0	a+b
HRV	2.3	3.6	3.6	2.3	4.1	4.1	2.3	3.7	3.7	2.3	3.3	3.7	2.3	3.9	3.9	2.8	4.2	4.2	2.8	3.2	3.2	2.3	3.0	3.0	2.3	3.9	4.0	a
HUN	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.2	4.2	3.5	4.5	4.5	a+b
IRL	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.2	4.2	3.5	4.5	4.5	a+b
LTU	2.9	3.5	3.8	2.9	3.5	3.7	3.4	3.9	4.1	3.4	3.6	3.6	3.5	4.1	4.2	3.9	4.5	4.5	2.9	3.7	4.1	3.4	3.9	3.9	3.5	4.1	4.1	a+b
LUX	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.6	4.6	3.5	4.5	4.5	a+b
LVA	3.5	4.1	4.3	3.5	4.2	4.2	3.3	3.8	4.1	3.1	3.4	3.5	3.5	4.0	4.1	4.1	4.8	4.8	3.8	4.2	4.3	3.5	4.2	4.2	3.5	4.5	4.5	a+b
NLD	3.3	3.6	3.7	3.4	3.9	3.9	3.4	4.0	4.1	3.0	3.6	3.8	3.3	4.1	4.1	3.8	4.4	4.4	3.2	3.5	4.1	3.4	3.8	3.8	3.2	3.6	3.6	b
NOR	3.6	4.0	4.1	3.8	4.5	4.5	3.8	4.1	4.2	3.6	3.9	4.1	3.8	4.3	4.3	4.3	4.7	4.7	3.4	3.8	4.3	3.8	4.5	4.5	3.8	4.4	4.4	b
PRT	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.8	4.2	4.3	3.5	4.2	4.2	3.5	4.5	4.5	a
SVK	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.2	4.2	3.5	4.5	4.5	a
SVN	3.5	4.1	4.3	3.5	4.6	4.6	3.5	4.2	4.3	3.5	4.0	4.0	3.5	4.4	4.4	4.1	4.8	4.8	3.4	4.0	4.1	3.5	4.2	4.2	3.5	4.5	4.5	a
SWE	3.5	3.8	3.9	3.5	3.9	3.9	3.2	3.6	3.7	3.2	3.3	3.5	3.4	3.7	3.7	4.1	4.3	4.3	3.2	3.5	4.1	3.5	3.8	3.8	3.5	4.1	4.2	b
CEN	***3.5***	***3.7***	***3.8***	***3.5***	***4.2***	***4.2***	***3.5***	***3.8***	***3.8***	***3.2***	***3.4***	***3.7***	***3.5***	***4.0***	***4.0***	***4.1***	***4.3***	***4.3***	***3.1***	***3.4***	***4.1***	***3.5***	***3.7***	***3.7***	***3.5***	***4.0***	***4.1***	a+b
BEL	3.5	3.7	3.8	3.5	4.2	4.2	3.5	3.8	3.8	3.2	3.4	3.7	3.5	4.0	4.0	4.1	4.3	4.3	3.1	3.4	4.1	3.5	4.2	4.2	3.5	4.0	4.1	a+b
CZE	3.0	3.3	3.6	3.5	3.7	3.7	3.5	3.8	3.8	3.2	3.4	3.7	3.5	4.0	4.0	4.1	4.3	4.3	3.1	3.4	4.1	3.5	4.2	4.2	3.5	4.0	4.1	a+b
GBR	3.5	3.9	4.0	3.5	4.4	4.4	3.5	4.0	4.1	3.4	3.7	3.8	3.5	4.2	4.2	4.1	4.5	4.6	3.3	3.7	4.1	3.5	3.9	3.9	3.5	3.8	3.8	a+b
HUN	3.5	3.7	3.8	3.5	4.2	4.2	3.5	3.8	3.8	3.2	3.4	3.7	3.5	4.0	4.0	4.1	4.3	4.3	3.1	3.4	4.1	3.5	3.7	3.7	3.5	4.0	4.1	a+b
IRL	3.5	3.7	3.8	3.5	4.2	4.2	3.5	3.8	3.8	3.2	3.4	3.7	3.5	4.0	4.0	4.1	4.3	4.3	3.1	3.4	4.1	3.5	3.7	3.7	3.5	4.0	4.1	a+b
LTU	2.7	3.0	3.5	2.7	3.0	3.5	3.3	3.5	3.7	2.9	3.0	3.5	3.4	3.6	3.7	3.7	3.9	4.1	2.7	3.0	4.1	3.2	3.4	3.6	3.5	3.6	3.7	a+b
LUX	3.5	3.7	3.8	3.5	4.2	4.2	3.5	3.8	3.8	3.2	3.4	3.7	3.5	4.0	4.0	4.1	4.3	4.3	3.1	3.4	4.1	3.5	4.2	4.2	3.5	4.0	4.1	a+b
LVA	3.5	3.7	3.8	3.5	3.7	3.7	3.2	3.4	3.7	2.8	2.9	3.5	3.3	3.6	3.7	4.1	4.3	4.3	3.5	3.7	4.1	3.5	3.7	3.7	3.5	4.0	4.1	a+b

Table 22 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio **χ = 0.4,** considering the categories of imposed loads A to D2 – **steel tie**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***3.5***	***4.1***	***4.9***	***4.0***	***4.9***	***5.3***	***3.6***	***4.3***	***5.0***	***4.0***	***4.8***	***4.8***	***3.8***	***4.5***	***5.1***	***4.4***	***5.5***	***5.8***	***3.4***	***4.6***	***5.0***	***3.6***	***4.5***	***4.8***	***4.0***	***5.0***	***5.2***	**a+b**
BEL	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	4.0	5.0	5.3	4.0	5.0	5.2	a+b
BGR	3.6	4.4	5.3	4.3	5.2	5.7	3.7	4.5	5.4	4.4	5.3	5.3	4.0	4.8	5.5	4.6	5.9	6.2	5.1	6.4	6.5	3.8	4.8	5.2	4.3	5.3	5.6	a
CYP	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	4.0	5.0	5.3	4.0	5.0	5.2	a
CZE	3.0	3.7	4.5	3.6	4.4	4.9	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	4.0	5.0	5.3	4.0	5.0	5.2	a+b
DNK	3.3	3.8	4.6	3.9	4.6	4.7	3.5	4.0	4.6	3.6	5.1	5.3	4.0	4.7	5.0	4.7	5.7	5.8	3.9	4.6	5.4	4.0	5.2	5.2	3.9	5.2	5.2	c
FIN	3.3	3.7	4.0	3.4	3.9	4.0	3.0	3.4	4.0	2.8	3.2	4.0	3.2	3.6	4.0	4.1	4.9	4.9	4.0	4.6	4.9	3.3	3.9	4.0	3.3	4.4	4.4	c
FRA	3.0	3.7	4.5	3.6	4.4	4.9	3.2	3.9	4.6	4.0	4.8	4.8	3.4	4.1	4.7	4.4	5.5	5.8	3.9	5.0	5.2	4.0	5.0	5.3	4.0	5.0	5.2	a
GBR	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	3.6	4.5	4.8	3.5	4.4	4.7	a+b
HRV	2.2	3.6	3.7	2.2	4.3	4.3	2.2	3.8	3.9	2.2	3.8	4.0	2.2	4.0	4.1	3.0	4.7	4.7	3.0	3.6	3.6	2.2	3.1	3.1	2.2	4.2	4.2	a
HUN	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	3.6	4.5	4.8	4.0	5.0	5.2	a+b
IRL	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	3.6	4.5	4.8	4.0	5.0	5.2	a+b
LTU	2.7	3.5	4.4	2.7	3.6	4.3	3.3	3.9	4.7	3.6	4.3	4.3	3.5	4.2	4.8	4.0	5.1	5.4	2.9	4.2	4.9	3.2	4.1	4.5	3.7	4.5	4.8	a+b
LUX	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	4.0	5.0	5.3	4.0	5.0	5.2	a+b
LVA	3.5	4.1	4.9	3.6	4.4	4.9	3.2	3.9	4.6	3.3	4.1	4.2	3.4	4.1	4.7	4.4	5.5	5.8	3.9	5.0	5.2	3.6	4.5	4.8	4.0	5.0	5.2	a+b
NLD	3.2	3.6	4.0	3.5	4.0	4.2	3.6	4.1	4.4	3.4	4.3	4.3	3.7	4.2	4.4	4.3	5.1	5.1	3.2	4.0	4.9	3.5	4.0	4.1	3.4	3.9	4.0	b
NOR	3.5	4.1	4.8	4.2	4.8	5.1	3.7	4.2	4.8	4.3	4.7	4.8	3.9	4.5	4.9	4.5	5.4	5.5	3.5	4.4	5.3	4.2	4.9	5.1	4.2	4.9	5.0	b
PRT	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.9	5.0	5.2	3.6	4.5	4.8	4.0	5.0	5.2	a
SVK	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	3.6	4.5	4.8	4.0	5.0	5.2	a
SVN	3.5	4.1	4.9	4.0	4.9	5.3	3.6	4.3	5.0	4.0	4.8	4.8	3.8	4.5	5.1	4.4	5.5	5.8	3.4	4.6	5.0	3.6	4.5	4.8	4.0	5.0	5.2	a
SWE	3.4	3.8	4.3	3.5	4.0	4.3	3.1	3.6	4.2	3.6	3.8	4.0	3.3	3.8	4.2	4.1	4.9	5.0	3.2	4.0	4.9	3.5	4.0	4.2	4.0	4.5	4.6	b
CEN	***3.3***	***3.7***	***4.3***	***4.0***	***4.4***	***4.5***	***3.5***	***3.9***	***4.4***	***3.8***	***4.0***	***4.2***	***3.7***	***4.1***	***4.4***	***4.2***	***4.9***	***5.1***	***3.1***	***3.8***	***4.9***	***3.4***	***3.9***	***4.2***	***3.9***	***4.4***	***4.4***	**a+b**
BEL	3.3	3.7	4.3	4.0	4.4	4.5	3.5	3.9	4.4	3.8	4.0	4.2	3.7	4.1	4.4	4.2	4.9	5.1	3.1	3.8	4.9	4.0	4.5	4.5	3.9	4.4	4.4	a+b
CZE	2.9	3.3	4.2	3.5	3.9	4.3	3.5	3.9	4.4	3.8	4.0	4.2	3.7	4.1	4.4	4.2	4.9	5.1	3.1	3.8	4.9	4.0	4.5	4.5	3.9	4.4	4.4	a+b
GBR	3.4	3.9	4.4	4.0	4.7	4.9	3.5	4.1	4.5	3.9	4.5	4.5	3.7	4.3	4.6	4.3	5.2	5.3	3.3	4.2	4.9	3.5	4.2	4.4	3.4	4.1	4.2	a+b
HUN	3.3	3.7	4.3	4.0	4.4	4.5	3.5	3.9	4.4	3.8	4.0	4.2	3.7	4.1	4.4	4.2	4.9	5.1	3.1	3.8	4.9	3.4	3.9	4.2	3.9	4.4	4.4	a+b
IRL	3.3	3.7	4.3	4.0	4.4	4.5	3.5	3.9	4.4	3.8	4.0	4.2	3.7	4.1	4.4	4.2	4.9	5.1	3.1	3.8	4.9	3.4	3.9	4.2	3.9	4.4	4.4	a+b
LTU	2.6	3.0	4.1	2.5	3.0	4.0	3.1	3.5	4.2	3.3	3.4	4.0	3.3	3.7	4.3	3.7	4.4	4.9	2.6	3.3	4.9	3.1	3.5	4.1	3.5	3.9	4.2	a+b
LUX	3.3	3.7	4.3	4.0	4.4	4.5	3.5	3.9	4.4	3.8	4.0	4.2	3.7	4.1	4.4	4.2	4.9	5.1	3.1	3.8	4.9	4.0	4.5	4.5	3.9	4.4	4.4	a+b
LVA	3.3	3.7	4.3	3.5	3.9	4.3	3.0	3.4	4.2	3.0	3.2	4.0	3.2	3.6	4.2	4.2	4.9	5.1	3.6	4.2	4.9	3.4	3.9	4.2	3.9	4.4	4.4	a+b

Table 23 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio **χ = 0.4,** considering the categories of imposed loads A to D2 – **steel column**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***3.8***	***4.4***	***4.6***	***3.9***	***4.9***	***5.0***	***3.9***	***4.5***	***4.7***	***3.9***	***4.4***	***4.5***	***3.9***	***4.7***	***4.8***	***4.5***	***5.2***	***5.2***	***3.7***	***4.4***	***4.6***	***3.9***	***4.5***	***4.6***	***3.9***	***4.9***	***4.9***	**a+b**
BEL	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	5.0	5.0	3.9	4.9	4.9	a+b
BGR	3.9	4.6	4.9	4.2	5.2	5.3	4.0	4.7	5.0	4.2	4.8	4.8	4.2	4.9	5.1	4.8	5.5	5.5	4.8	5.7	5.7	4.1	4.8	4.9	4.2	5.1	5.1	a
CYP	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	5.0	5.0	3.9	4.9	4.9	a
CZE	3.4	4.0	4.4	3.9	4.5	4.6	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	5.0	5.0	3.9	4.9	4.9	a+b
DNK	3.6	4.1	4.3	3.9	4.6	4.6	3.8	4.2	4.3	3.6	4.6	5.0	3.9	4.8	4.9	4.4	5.3	5.4	4.1	4.4	4.9	3.9	5.1	5.1	3.9	5.0	5.0	c
FIN	3.5	4.0	4.1	3.5	4.1	4.1	3.4	3.7	3.9	3.1	3.3	3.9	3.5	3.9	3.9	4.0	4.7	4.7	3.9	4.4	4.5	3.4	4.0	4.0	3.5	4.4	4.4	c
FRA	3.4	4.0	4.4	3.9	4.5	4.6	3.5	4.1	4.5	3.9	4.4	4.5	3.7	4.3	4.5	4.5	5.2	5.2	4.1	4.7	4.7	3.9	5.0	5.0	3.9	4.9	4.9	a
GBR	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	4.5	4.6	3.8	4.4	4.4	a+b
HRV	2.7	3.9	3.9	2.7	4.4	4.4	2.7	4.0	4.1	2.7	3.8	4.1	2.7	4.2	4.2	3.2	4.6	4.6	3.2	3.6	3.6	2.7	3.4	3.4	2.7	4.3	4.3	a
HUN	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	4.5	4.6	3.9	4.9	4.9	a+b
IRL	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	4.5	4.6	3.9	4.9	4.9	a+b
LTU	3.1	3.8	4.2	3.1	3.8	4.1	3.6	4.2	4.5	3.8	4.0	4.1	3.8	4.4	4.6	4.2	4.9	4.9	3.3	4.1	4.5	3.6	4.2	4.4	3.9	4.5	4.5	a+b
LUX	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	5.0	5.0	3.9	4.9	4.9	a+b
LVA	3.8	4.4	4.6	3.9	4.5	4.6	3.5	4.1	4.5	3.5	3.9	4.0	3.7	4.3	4.5	4.5	5.2	5.2	4.1	4.7	4.7	3.9	4.5	4.6	3.9	4.9	4.9	a+b
NLD	3.5	3.9	4.0	3.8	4.2	4.2	3.8	4.3	4.4	3.5	4.0	4.2	3.8	4.4	4.4	4.2	4.8	4.8	3.5	4.0	4.5	3.8	4.2	4.2	3.7	4.0	4.0	b
NOR	3.8	4.3	4.5	4.2	4.9	4.9	4.0	4.4	4.6	4.1	4.4	4.5	4.2	4.6	4.7	4.7	5.1	5.1	3.8	4.3	4.8	4.2	4.9	4.9	4.2	4.8	4.8	b
PRT	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	4.1	4.7	4.7	3.9	4.5	4.6	3.9	4.9	4.9	a
SVK	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	4.5	4.6	3.9	4.9	4.9	a
SVN	3.8	4.4	4.6	3.9	4.9	5.0	3.9	4.5	4.7	3.9	4.4	4.5	3.9	4.7	4.8	4.5	5.2	5.2	3.7	4.4	4.6	3.9	4.5	4.6	3.9	4.9	4.9	a
SWE	3.7	4.1	4.2	3.8	4.2	4.2	3.4	3.8	4.1	3.6	3.8	3.9	3.6	4.0	4.1	4.4	4.7	4.7	3.5	4.0	4.5	3.8	4.2	4.2	3.9	4.5	4.5	b
CEN	***3.7***	***4.0***	***4.2***	***3.9***	***4.5***	***4.5***	***3.8***	***4.1***	***4.2***	***3.7***	***3.9***	***4.1***	***3.9***	***4.3***	***4.3***	***4.5***	***4.7***	***4.7***	***3.5***	***3.8***	***4.5***	***3.8***	***4.0***	***4.1***	***3.9***	***4.4***	***4.4***	**a+b**
BEL	3.7	4.0	4.2	3.9	4.5	4.5	3.8	4.1	4.2	3.7	3.9	4.1	3.9	4.3	4.3	4.5	4.7	4.7	3.5	3.8	4.5	3.9	4.5	4.5	3.9	4.4	4.4	a+b
CZE	3.2	3.6	4.1	3.8	4.1	4.1	3.8	4.1	4.2	3.7	3.9	4.1	3.9	4.3	4.3	4.5	4.7	4.7	3.5	3.8	4.5	3.9	4.5	4.5	3.9	4.4	4.4	a+b
GBR	3.7	4.2	4.4	3.9	4.7	4.7	3.8	4.3	4.4	3.8	4.2	4.3	3.9	4.5	4.6	4.5	5.0	5.0	3.6	4.1	4.5	3.8	4.3	4.3	3.7	4.1	4.1	a+b
HUN	3.7	4.0	4.2	3.9	4.5	4.5	3.8	4.1	4.2	3.7	3.9	4.1	3.9	4.3	4.3	4.5	4.7	4.7	3.5	3.8	4.5	3.8	4.0	4.1	3.9	4.4	4.4	a+b
IRL	3.7	4.0	4.2	3.9	4.5	4.5	3.8	4.1	4.2	3.7	3.9	4.1	3.9	4.3	4.3	4.5	4.7	4.7	3.5	3.8	4.5	3.8	4.0	4.1	3.9	4.4	4.4	a+b
LTU	2.9	3.3	4.0	2.9	3.3	3.9	3.5	3.8	4.1	3.4	3.5	3.9	3.6	4.0	4.1	4.0	4.3	4.5	3.0	3.5	4.5	3.4	3.7	4.0	3.8	4.0	4.0	a+b
LUX	3.7	4.0	4.2	3.9	4.5	4.5	3.8	4.1	4.2	3.7	3.9	4.1	3.9	4.3	4.3	4.5	4.7	4.7	3.5	3.8	4.5	3.9	4.5	4.5	3.9	4.4	4.4	a+b
LVA	3.7	4.0	4.2	3.8	4.1	4.1	3.4	3.7	4.1	3.3	3.3	3.9	3.6	3.9	4.1	4.5	4.7	4.7	3.9	4.1	4.5	3.8	4.0	4.1	3.9	4.4	4.4	a+b

For a **timber beam** (see Table 24) and for the load ratio χ = 0.4, the results show that for the category of imposed loads C5 the reliability level is below the recommended reliability level for CEN and for all countries, except Bulgaria. The same happens for most countries and CEN for the categories of imposed load C2 and C4 when *procedure b* is chosen. The maximum relative difference to the recommended target is achieved by Lithuania for the load ratio χ = 0.4, for the category of imposed load C5 and *procedure b*, with a value equal to -22%, whereas CEN shows a relative difference of -17% (see Table 34). For all countries, CEN and categories of imposed loads, the minimum reliability level β_{min} is below the CEN recommended reliability level.

For a **timber column** (see Table 25), and for the load ratio χ = 0.4, the results show that for the category of imposed loads C2, C4 and C5 the reliability level is below recommended reliability level for CEN for all countries, except for Denmark. The maximum relative difference to the recommended target is achieved by Lithuania for the load ratio χ = 0.4, for the category of imposed load C5 and *procedure b*, with a value equal to -22%. CEN shows a maximum relative difference of -18% for the same situation (Table 35). For all countries, CEN and all categories of imposed loads, the minimum reliability level β_{min} is below the CEN recommended reliability. The maximum reliability level β_{max} is also below the CEN recommended level for the category of imposed load C5 for all countries except Bulgaria.

For a **masonry wall** (see Table 26 and Table 36), the results show that for the vast majority of countries and categories of loaded areas the reliability levels are equal or above the CEN recommended level for the reliability categories RC2 and RC3. An exception occurs for the Netherlands for the category of imposed loads C5 for the load ratio χ = 0.4, and for Denmark and the Netherlands for the minimum reliability level β_{min}, where the reliability levels are below the CEN recommended reliability level. France, the United Kingdom and Sweden achieved differences to the CEN target level higher than +50%, for all categories of imposed loads, except for C5. The reliability levels obtained for CEN show differences from the target level ranging from +16% (imposed load C5, *procedure b)* to +51% (imposed load B, *procedure a*).

Table 24 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio **χ = 0.4,** considering the categories of imposed loads A to D2 – **timber beam**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***3.6***	***4.3***	***4.3***	***3.6***	***4.5***	***4.6***	***3.6***	***4.4***	***4.4***	***3.6***	***3.9***	***4.0***	***3.6***	***4.4***	***4.4***	***4.0***	***4.5***	***4.6***	***3.7***	***4.0***	***4.0***	***3.6***	***4.2***	***4.2***	***3.6***	***4.4***	***4.4***	a+b
BEL	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.5	4.6	3.6	4.4	4.4	a+b
BGR	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	4.0	4.6	4.7	3.6	4.2	4.2	3.6	4.4	4.4	a
CYP	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.5	4.6	3.6	4.4	4.4	a
CZE	3.6	4.0	4.1	3.6	4.3	4.3	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.5	4.6	3.6	4.4	4.4	a+b
DNK	3.1	3.6	3.6	3.1	3.8	4.0	3.1	3.7	3.8	2.9	3.5	3.9	3.1	4.1	4.2	3.4	4.1	4.4	3.2	3.4	3.7	3.1	4.1	4.4	3.1	3.9	4.3	c
FIN	3.4	4.0	4.0	3.4	3.9	4.0	3.4	3.8	3.8	3.1	3.2	3.6	3.4	3.9	3.9	3.7	4.2	4.4	3.6	4.0	4.1	3.3	3.9	4.0	3.4	4.1	4.3	c
FRA	3.6	4.0	4.1	3.6	4.3	4.3	3.6	4.1	4.1	3.6	3.9	4.0	3.6	4.2	4.2	4.0	4.5	4.6	4.0	4.1	4.1	3.6	4.5	4.6	3.6	4.4	4.4	a
GBR	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.2	4.2	3.6	4.1	4.1	a+b
HRV	2.9	3.9	4.0	2.9	4.2	4.4	2.9	4.0	4.1	2.9	3.5	3.8	2.9	4.1	4.2	3.2	4.1	4.4	3.2	3.5	3.5	2.9	3.4	3.5	2.9	4.0	4.2	a
HUN	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.2	4.2	3.6	4.4	4.4	a+b
IRL	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.2	4.2	3.6	4.4	4.4	a+b
LTU	3.4	3.8	3.9	3.4	3.8	3.8	3.6	4.2	4.2	3.6	3.7	3.7	3.6	4.2	4.2	4.0	4.3	4.3	3.4	3.8	4.0	3.6	4.0	4.0	3.6	4.1	4.2	a+b
LUX	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.5	4.6	3.6	4.4	4.4	a+b
LVA	3.6	4.3	4.3	3.6	4.3	4.3	3.6	4.1	4.1	3.4	3.6	3.7	3.6	4.2	4.2	4.0	4.5	4.6	4.0	4.1	4.1	3.6	4.2	4.2	3.6	4.4	4.4	a+b
NLD	3.6	3.9	3.9	3.6	4.0	4.1	3.6	4.2	4.3	3.4	3.7	3.9	3.6	4.2	4.3	3.8	4.3	4.4	3.6	3.7	4.0	3.6	4.0	4.0	3.5	3.8	3.9	b
NOR	3.5	4.0	4.0	3.5	4.2	4.3	3.5	4.0	4.1	3.4	3.5	3.7	3.5	4.1	4.2	3.9	4.2	4.3	3.4	3.5	3.9	3.5	4.2	4.3	3.5	4.0	4.2	b
PRT	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	4.0	4.1	4.1	3.6	4.2	4.2	3.6	4.4	4.4	a
SVK	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.2	4.2	3.6	4.4	4.4	a
SVN	3.6	4.3	4.3	3.6	4.5	4.6	3.6	4.4	4.4	3.6	3.9	4.0	3.6	4.4	4.4	4.0	4.5	4.6	3.7	4.0	4.0	3.6	4.2	4.2	3.6	4.4	4.4	a
SWE	3.6	4.1	4.1	3.6	4.0	4.1	3.6	3.9	3.9	3.4	3.5	3.6	3.6	3.9	4.0	4.0	4.2	4.3	3.6	3.7	4.0	3.6	4.0	4.0	3.6	4.1	4.3	b
CEN	***3.6***	***4.0***	***4.0***	***3.6***	***4.2***	***4.4***	***3.6***	***4.1***	***4.1***	***3.5***	***3.6***	***3.8***	***3.6***	***4.2***	***4.2***	***4.0***	***4.2***	***4.4***	***3.5***	***3.6***	***4.0***	***3.6***	***3.9***	***4.0***	***3.6***	***4.0***	***4.3***	a+b
BEL	3.6	4.0	4.0	3.6	4.2	4.4	3.6	4.1	4.1	3.5	3.6	3.8	3.6	4.2	4.2	4.0	4.2	4.4	3.5	3.6	4.0	3.6	4.2	4.4	3.6	4.0	4.3	a+b
CZE	3.6	3.7	3.8	3.6	3.9	4.0	3.6	4.1	4.1	3.5	3.6	3.8	3.6	4.2	4.2	4.0	4.2	4.4	3.5	3.6	4.0	3.6	4.2	4.4	3.6	4.0	4.3	a+b
GBR	3.6	4.2	4.2	3.6	4.4	4.5	3.6	4.2	4.2	3.6	3.8	3.9	3.6	4.3	4.3	4.0	4.4	4.5	3.6	3.8	4.0	3.6	4.1	4.1	3.6	3.9	3.9	a+b
HUN	3.6	4.0	4.0	3.6	4.2	4.4	3.6	4.1	4.1	3.5	3.6	3.8	3.6	4.2	4.2	4.0	4.2	4.4	3.5	3.6	4.0	3.6	3.9	4.0	3.6	4.0	4.3	a+b
IRL	3.6	4.0	4.0	3.6	4.2	4.4	3.6	4.1	4.1	3.5	3.6	3.8	3.6	4.2	4.2	4.0	4.2	4.4	3.5	3.6	4.0	3.6	3.9	4.0	3.6	4.0	4.3	a+b
LTU	3.3	3.5	3.7	3.3	3.4	3.6	3.6	3.9	3.9	3.3	3.3	3.6	3.6	3.9	4.0	3.9	4.0	4.1	3.2	3.4	4.0	3.6	3.7	3.7	3.6	3.8	4.0	a+b
LUX	3.6	4.0	4.0	3.6	4.2	4.4	3.6	4.1	4.1	3.5	3.6	3.8	3.6	4.2	4.2	4.0	4.2	4.4	3.5	3.6	4.0	3.6	4.2	4.4	3.6	4.0	4.3	a+b
LVA	3.6	4.0	4.0	3.6	3.9	4.0	3.6	3.8	3.8	3.2	3.2	3.6	3.6	3.9	3.9	4.0	4.2	4.4	3.7	3.8	4.0	3.6	3.9	4.0	3.6	4.0	4.3	a+b

Table 25 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio **χ = 0.4,** considering the categories of imposed loads A to D2 – **timber column**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***3.6***	***4.2***	***4.2***	***3.6***	***4.3***	***4.4***	***3.6***	***4.2***	***4.3***	***3.6***	***3.8***	***3.8***	***3.6***	***4.2***	***4.3***	***3.8***	***4.2***	***4.4***	***3.7***	***3.8***	***3.8***	***3.6***	***4.0***	***4.1***	***3.6***	***4.1***	***4.3***	a+b
BEL	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.3	4.4	3.6	4.1	4.3	a+b
BGR	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.8	4.3	4.4	3.6	4.0	4.1	3.6	4.1	4.3	a
CYP	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.3	4.4	3.6	4.1	4.3	a
CZE	3.6	4.0	4.0	3.6	4.1	4.1	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.3	4.4	3.6	4.1	4.3	a+b
DNK	3.1	3.6	3.7	3.1	3.7	4.0	3.2	3.7	3.8	3.0	3.4	3.7	3.2	4.0	4.2	3.4	3.9	4.3	3.2	3.4	3.6	3.2	4.0	4.4	3.1	3.8	4.2	c
FIN	3.4	4.0	4.0	3.4	3.8	4.0	3.4	3.8	3.8	3.2	3.3	3.6	3.4	3.8	3.9	3.6	4.0	4.3	3.5	3.8	4.0	3.3	3.8	4.0	3.4	3.9	4.2	c
FRA	3.6	4.0	4.0	3.6	4.1	4.1	3.6	4.0	4.0	3.6	3.8	3.8	3.6	4.0	4.1	3.8	4.2	4.4	3.8	3.9	3.9	3.6	4.3	4.4	3.6	4.1	4.3	a
GBR	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.0	4.1	3.6	3.9	3.9	a+b
HRV	3.0	3.9	4.0	3.0	4.0	4.3	3.0	4.0	4.1	3.0	3.5	3.7	3.0	4.0	4.2	3.3	3.9	4.2	3.3	3.4	3.5	3.0	3.4	3.5	3.0	3.8	4.2	a
HUN	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.0	4.1	3.6	4.1	4.3	a+b
IRL	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.0	4.1	3.6	4.1	4.3	a+b
LTU	3.6	3.8	3.8	3.5	3.7	3.7	3.6	4.1	4.1	3.5	3.6	3.6	3.6	4.1	4.1	3.8	4.1	4.1	3.4	3.7	3.8	3.6	3.9	3.9	3.6	4.0	4.0	a+b
LUX	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.3	4.4	3.6	4.1	4.3	a+b
LVA	3.6	4.2	4.2	3.6	4.1	4.1	3.6	4.0	4.0	3.4	3.5	3.6	3.6	4.0	4.1	3.8	4.2	4.4	3.8	3.9	3.9	3.6	4.0	4.1	3.6	4.1	4.3	a+b
NLD	3.5	3.9	3.9	3.6	3.9	4.1	3.5	4.1	4.2	3.4	3.6	3.7	3.5	4.1	4.2	3.7	4.1	4.3	3.6	3.6	3.8	3.5	3.9	4.0	3.5	3.7	3.9	b
NOR	3.5	3.9	4.0	3.5	4.0	4.3	3.5	4.0	4.1	3.3	3.5	3.6	3.5	4.0	4.2	3.7	4.0	4.2	3.5	3.5	3.7	3.5	4.0	4.3	3.5	3.9	4.1	b
PRT	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.8	3.9	3.9	3.6	4.0	4.1	3.6	4.1	4.3	a
SVK	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.0	4.1	3.6	4.1	4.3	a
SVN	3.6	4.2	4.2	3.6	4.3	4.4	3.6	4.2	4.3	3.6	3.8	3.8	3.6	4.2	4.3	3.8	4.2	4.4	3.7	3.8	3.8	3.6	4.0	4.1	3.6	4.1	4.3	a
SWE	3.6	4.0	4.1	3.6	3.9	4.1	3.6	3.8	3.9	3.4	3.5	3.6	3.6	3.9	3.9	3.8	4.0	4.2	3.6	3.6	3.8	3.6	3.9	4.0	3.6	4.0	4.2	b
CEN	***3.6***	***4.0***	***4.0***	***3.6***	***4.1***	***4.4***	***3.6***	***4.0***	***4.1***	***3.4***	***3.5***	***3.7***	***3.6***	***4.0***	***4.2***	***3.8***	***4.0***	***4.3***	***3.5***	***3.5***	***3.8***	***3.6***	***3.8***	***4.0***	***3.6***	***3.9***	***4.2***	a+b
BEL	3.6	4.0	4.0	3.6	4.1	4.4	3.6	4.0	4.1	3.4	3.5	3.7	3.6	4.0	4.2	3.8	4.0	4.3	3.5	3.5	3.8	3.6	4.0	4.3	3.6	3.9	4.2	a+b
CZE	3.6	3.7	3.8	3.6	3.8	4.0	3.6	4.0	4.1	3.4	3.5	3.7	3.6	4.0	4.2	3.8	4.0	4.3	3.5	3.5	3.8	3.6	4.0	4.3	3.6	3.9	4.2	a+b
GBR	3.6	4.1	4.1	3.6	4.2	4.4	3.6	4.1	4.2	3.5	3.6	3.8	3.6	4.1	4.3	3.8	4.1	4.3	3.6	3.7	3.8	3.6	3.9	4.0	3.6	3.8	3.9	a+b
HUN	3.6	4.0	4.0	3.6	4.1	4.4	3.6	4.0	4.1	3.4	3.5	3.7	3.6	4.0	4.2	3.8	4.0	4.3	3.5	3.5	3.8	3.6	3.8	4.0	3.6	3.9	4.2	a+b
IRL	3.6	4.0	4.0	3.6	4.1	4.4	3.6	4.0	4.1	3.4	3.5	3.7	3.6	4.0	4.2	3.8	4.0	4.3	3.5	3.5	3.8	3.6	3.8	4.0	3.6	3.9	4.2	a+b
LTU	3.5	3.6	3.6	3.4	3.4	3.6	3.6	3.8	3.9	3.3	3.3	3.6	3.6	3.8	4.0	3.8	3.8	4.0	3.3	3.4	3.8	3.6	3.6	3.8	3.6	3.7	3.9	a+b
LUX	3.6	4.0	4.0	3.6	4.1	4.4	3.6	4.0	4.1	3.4	3.5	3.7	3.6	4.0	4.2	3.8	4.0	4.3	3.5	3.5	3.8	3.6	4.0	4.3	3.6	3.9	4.2	a+b
LVA	3.6	4.0	4.0	3.6	3.8	4.0	3.6	3.8	3.8	3.2	3.2	3.6	3.6	3.8	3.9	3.8	4.0	4.3	3.6	3.7	3.8	3.6	3.8	4.0	3.6	3.9	4.2	a+b

Table 26 - Minimum and maximum reliability levels (β) for relevant χ load ratios, and reliability levels for the load ratio χ **= 0.4,** considering the categories of imposed loads A to D2 – **masonry wall**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***5.0***	***5.5***	***5.5***	***5.0***	***5.8***	***5.8***	***5.0***	***5.6***	***5.6***	***5.0***	***5.3***	***5.3***	***5.0***	***5.7***	***5.7***	***5.3***	***5.8***	***5.8***	***5.0***	***5.3***	***5.3***	***5.0***	***5.5***	***5.5***	***5.0***	***5.6***	***5.7***	a+b
BEL	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.7	5.8	5.0	5.6	5.7	a+b
BGR	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.3	5.8	5.9	5.0	5.5	5.5	5.0	5.6	5.7	a
CYP	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.7	5.8	5.0	5.6	5.7	a
CZE	5.1	5.6	5.7	5.4	5.9	5.9	5.4	5.9	6.0	5.4	5.7	5.7	5.4	6.0	6.0	5.7	6.1	6.2	5.4	5.7	5.7	5.4	6.1	6.1	5.4	6.0	6.0	a+b
DNK	3.6	4.1	4.1	3.6	4.3	4.4	3.6	4.2	4.2	3.5	4.0	4.3	3.6	4.5	4.6	3.9	4.5	4.8	3.7	3.9	4.2	3.7	4.5	4.8	3.6	4.4	4.7	c
FIN	4.8	5.3	5.3	4.8	5.2	5.3	4.8	5.1	5.1	4.6	4.7	5.0	4.8	5.2	5.2	5.1	5.5	5.6	5.0	5.3	5.4	4.8	5.2	5.2	4.8	5.4	5.5	c
FRA	5.4	5.9	6.1	5.8	6.2	6.2	5.5	6.0	6.1	5.8	6.0	6.1	5.7	6.1	6.1	6.1	6.5	6.6	6.0	6.1	6.2	5.8	6.5	6.6	5.8	6.3	6.5	a
GBR	5.8	6.4	6.4	6.0	6.7	6.7	5.9	6.4	6.5	6.0	6.2	6.4	6.0	6.6	6.6	6.2	6.8	7.2	6.0	6.2	6.2	6.0	6.4	6.4	6.0	6.3	6.3	a+b
HRV	4.8	5.6	5.6	4.8	5.8	5.9	4.8	5.6	5.6	4.8	5.3	5.5	4.8	5.7	5.7	5.1	5.8	5.9	5.1	5.3	5.3	4.8	5.2	5.2	4.8	5.7	5.8	a
HUN	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.5	5.5	5.0	5.6	5.7	a+b
IRL	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.5	5.5	5.0	5.6	5.7	a+b
LTU	5.3	6.0	6.2	5.4	6.0	6.1	5.7	6.3	6.3	5.9	6.1	6.1	5.9	6.4	6.4	6.2	6.6	6.6	5.7	6.1	6.2	5.8	6.2	6.2	6.0	6.4	6.4	a+b
LUX	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.7	5.8	5.0	5.6	5.7	a+b
LVA	5.6	6.1	6.1	5.7	6.1	6.1	5.4	5.9	6.0	5.5	5.6	5.7	5.6	6.0	6.0	6.0	6.4	6.5	5.9	6.1	6.1	5.7	6.1	6.1	5.7	6.2	6.3	a+b
NLD	4.2	4.5	4.5	4.2	4.5	4.6	4.2	4.7	4.8	4.0	4.2	4.4	4.1	4.7	4.8	4.4	4.8	4.9	4.2	4.3	4.5	4.2	4.5	4.6	4.1	4.4	4.4	b
NOR	5.0	5.3	5.3	5.0	5.6	5.6	5.0	5.4	5.4	4.9	5.1	5.2	5.0	5.5	5.5	5.3	5.6	5.7	4.9	5.1	5.3	5.0	5.6	5.6	5.0	5.4	5.5	b
PRT	5.4	5.9	5.9	5.4	6.1	6.1	5.4	5.9	6.0	5.4	5.7	5.7	5.4	6.0	6.0	5.7	6.1	6.2	5.7	5.8	5.8	5.4	5.9	5.9	5.4	6.0	6.0	a
SVK	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.5	5.5	5.0	5.6	5.7	a
SVN	5.0	5.5	5.5	5.0	5.8	5.8	5.0	5.6	5.6	5.0	5.3	5.3	5.0	5.7	5.7	5.3	5.8	5.8	5.0	5.3	5.3	5.0	5.5	5.5	5.0	5.6	5.7	a
SWE	5.8	6.2	6.2	6.0	6.2	6.2	5.6	6.0	6.1	5.8	5.9	6.0	5.7	6.1	6.1	6.2	6.5	6.5	5.8	6.0	6.2	5.9	6.2	6.2	6.0	6.4	6.4	b
CEN	***5.0***	***5.3***	***5.3***	***5.0***	***5.5***	***5.6***	***5.0***	***5.3***	***5.3***	***4.9***	***5.0***	***5.2***	***5.0***	***5.4***	***5.4***	***5.3***	***5.5***	***5.6***	***4.9***	***5.0***	***5.3***	***5.0***	***5.2***	***5.2***	***5.0***	***5.4***	***5.5***	a+b
BEL	5.0	5.3	5.3	5.0	5.5	5.6	5.0	5.3	5.3	4.9	5.0	5.2	5.0	5.4	5.4	5.3	5.5	5.6	4.9	5.0	5.3	5.0	5.5	5.6	5.0	5.4	5.5	a+b
CZE	5.0	5.4	5.5	5.4	5.6	5.6	5.4	5.7	5.7	5.3	5.4	5.6	5.4	5.8	5.8	5.7	5.9	6.1	5.3	5.4	5.7	5.4	5.9	5.9	5.4	5.7	5.8	a+b
GBR	5.8	6.3	6.3	6.0	6.6	6.6	5.9	6.3	6.4	5.9	6.1	6.3	6.0	6.4	6.4	6.2	6.6	6.7	5.9	6.1	6.2	6.0	6.3	6.3	6.0	6.1	6.2	a+b
HUN	5.0	5.3	5.3	5.0	5.5	5.6	5.0	5.3	5.3	4.9	5.0	5.2	5.0	5.4	5.4	5.3	5.5	5.6	4.9	5.0	5.3	5.0	5.2	5.2	5.0	5.4	5.5	a+b
IRL	5.0	5.3	5.3	5.0	5.5	5.6	5.0	5.3	5.3	4.9	5.0	5.2	5.0	5.4	5.4	5.3	5.5	5.6	4.9	5.0	5.3	5.0	5.2	5.2	5.0	5.4	5.5	a+b
LTU	5.2	5.7	6.0	5.3	5.7	6.0	5.6	6.0	6.1	5.7	5.8	6.0	5.8	6.1	6.1	6.1	6.2	6.3	5.5	5.8	6.2	5.7	6.0	6.0	6.0	6.1	6.1	a+b
LUX	5.0	5.3	5.3	5.0	5.5	5.6	5.0	5.3	5.3	4.9	5.0	5.2	5.0	5.4	5.4	5.3	5.5	5.6	4.9	5.0	5.3	5.0	5.5	5.6	5.0	5.4	5.5	a+b
LVA	5.5	5.8	5.9	5.7	5.9	5.9	5.3	5.7	5.8	5.3	5.3	5.7	5.5	5.8	5.8	6.0	6.1	6.2	5.7	5.8	6.0	5.7	5.8	5.8	5.7	6.0	6.1	a+b

5 Reliability of structural members considering the combination of imposed loads

In this chapter it is analysed the influence of the combination factor ψ_0 on the reliability of a selected structural members, namely a **concrete column** and a **steel column** (see Figure 1 to Figure 4).

The analysis was made for the combination of two imposed loads, *i.e.*, *o*ffice areas (**category B**) as the leading action, and residential areas (**category A**) as the accompanying action. Three different values for the combination factor ψ_0 were considered: the CEN recommended value equal to 0.7 and reduced values of ψ_0 equal to 0.6 and 0.5. A load ratio k = 1.0 between the accompanying and the main action was considered. ***Procedures a*** and ***b*** for the combination of actions are shown.

The indicative value β_t = 3.8, for the reliability class RC2, is illustrated by a grey dashed line in the Figures.

The results show that the reliability levels of a **reinforced concrete column** and of a **steel column** designed for the combination of two imposed loads (categories B and A) satisfy the recommended reliability index β_t given in EN 1990, not only for the combination factor recommended by CEN (0.7), but also for the other two values (0.6 and 0.5) considered. Also shown is that the higher the values of the combination factor ψ_0, the greater the reliability levels obtained.

Figure 1 - Reliability index β of a **reinforced concrete column** as a function of the load ratio χ, for the CEN recommended value of the combination factor ψ_0 **= 0.7** and for ψ_0 **= 0.6** and **0.5; procedure a** and selected load ratio k = 1

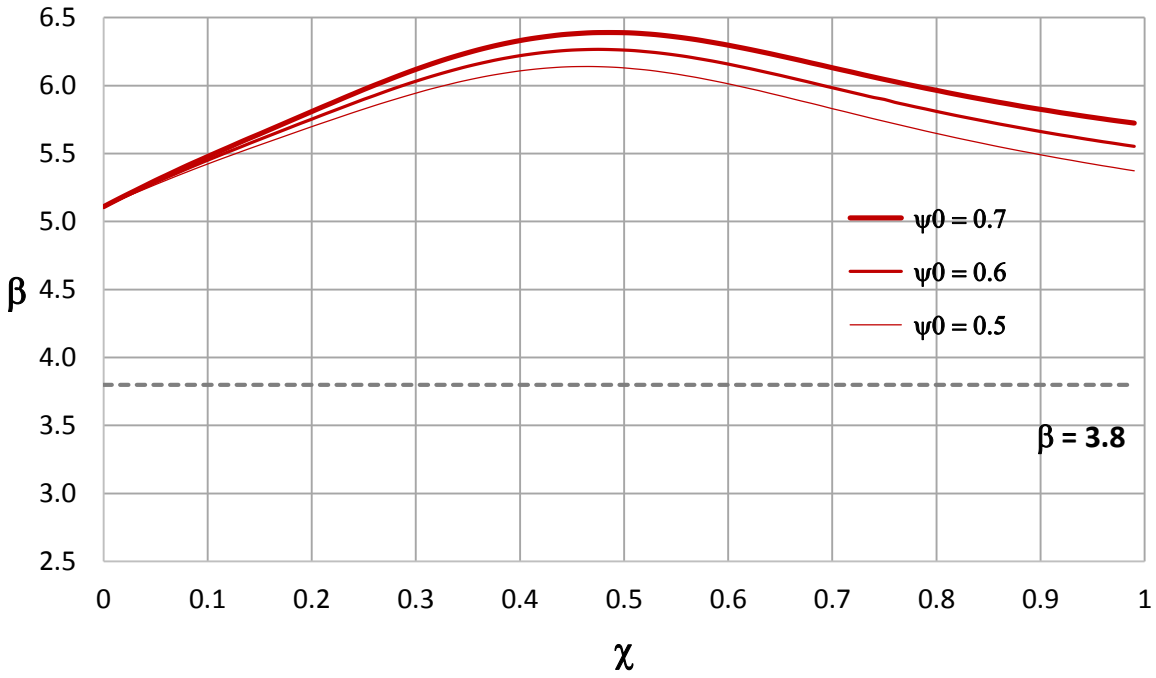


Figure 2 - Reliability index β of a **reinforced concrete column** as a function of the load ratio χ, for the CEN recommended value of the combination factor ψ_0 **= 0.7** and for ψ_0 **= 0.6** and **0.5; procedure b** and selected load ratio *k* = 1

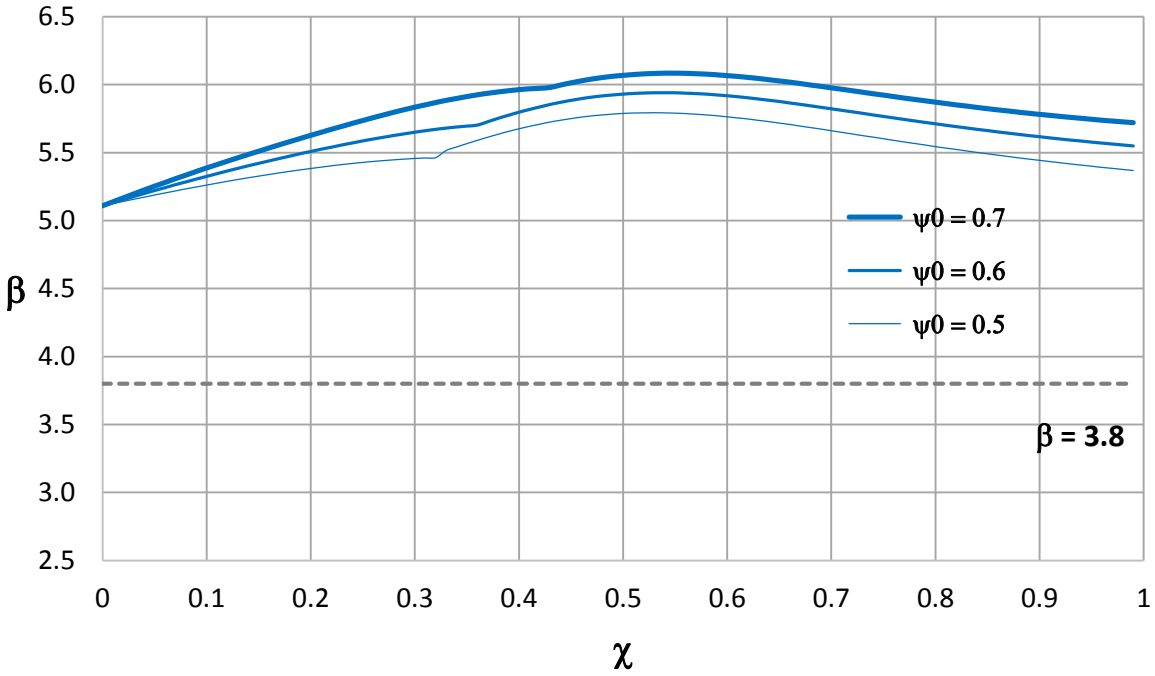


Figure 3 - Reliability index β of a **steel column** as a function of the load ratio χ, for the CEN recommended value of the combination factor ψ_0 **= 0.7** and for ψ_0 **= 0.6** and **0.5; procedure a** and selected load ratio *k* = 1

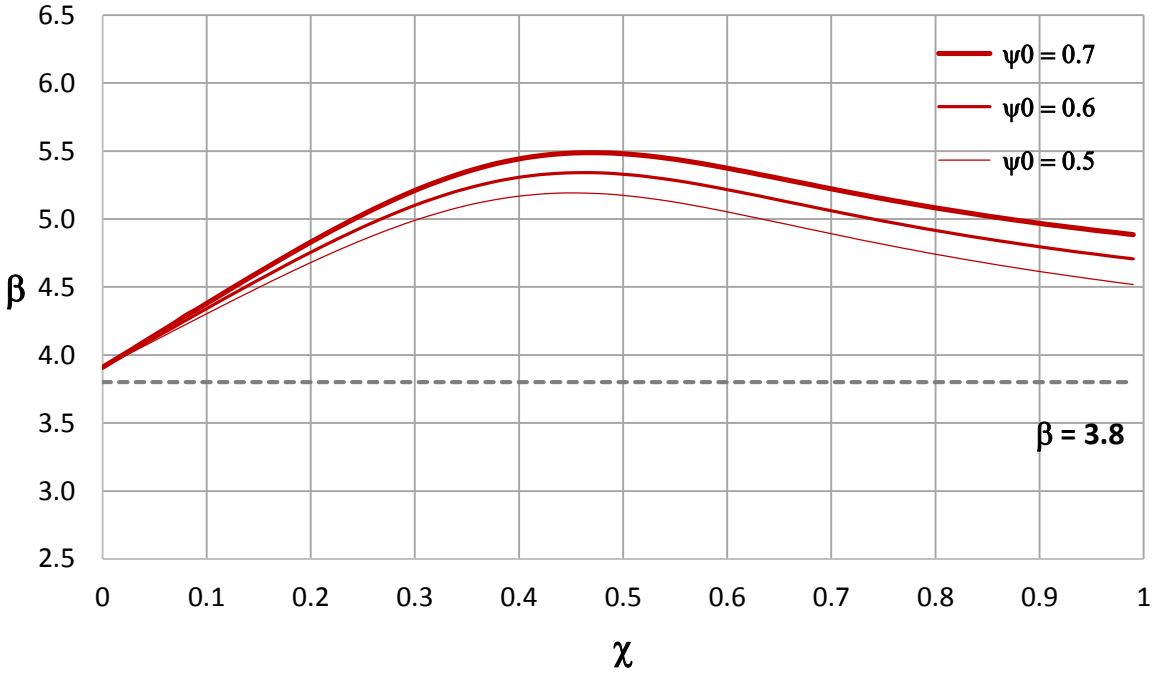
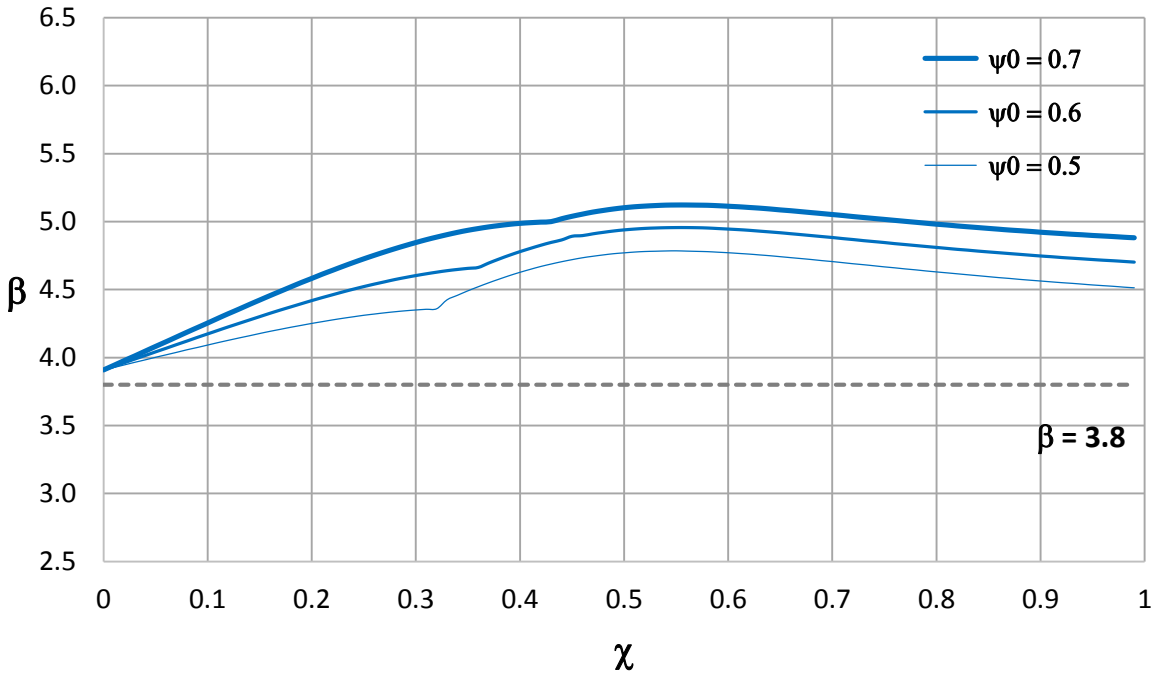


Figure 4 - Reliability index β of a **steel column** as a function of the load ratio χ, for the CEN recommended value of the combination factor ψ_0 **= 0.7** and for ψ_0 **= 0.6** and **0.5; procedure b** and selected load ratio *k* = 1



6 Reliability of structural members for the lower and upper bound of imposed loads using CEN NDPs values

This chapter presents the reliability levels of selected structural members designed according to CEN NDPs values considering the **upper** and **lower bounds** of the characteristic values of imposed loads provided in EN 1991-1-1 (see Table 7). The analysis is made for a building loaded area of **category B** and is illustrated in Figure 5 to Figure 22.

Alternative *procedures a* to *c* are considered. Alternative *procedure a* (exp. 6.10) is illustrated in red, alternative *procedure b* (exp. 6.10a & 6.10b) in blue, the lowest curve in dashed green represents alternative *procedure c* when in expression 6.10a only the permanent loads are considered ($6.10a_{mod}$ & 6.10b).

Figure 5 - Reliability index β of a **reinforced concrete beam** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

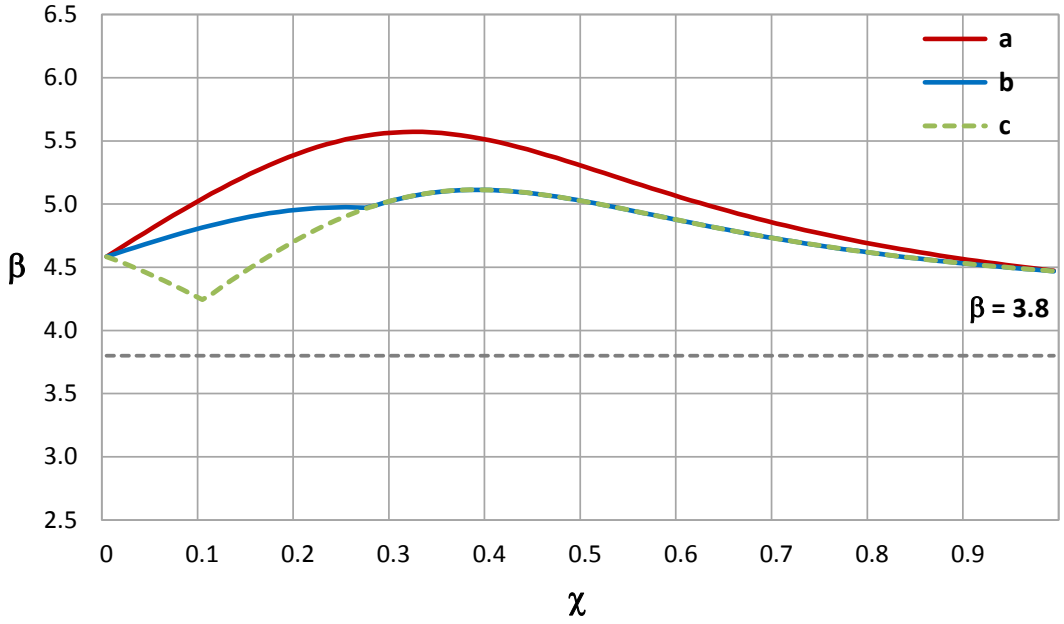
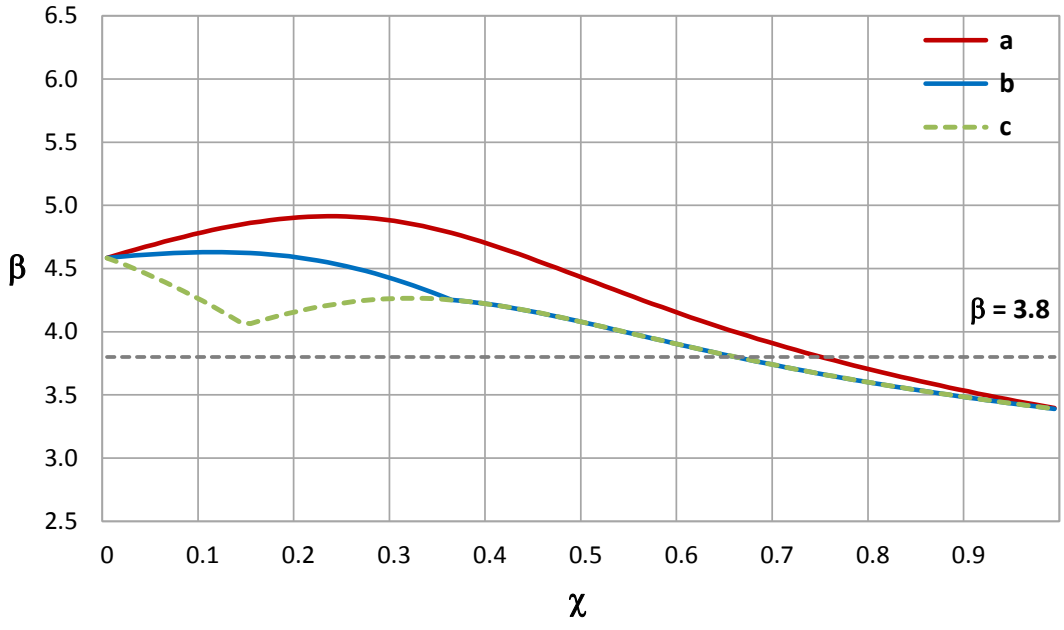


Figure 6 - Reliability index β of a **reinforced concrete beam** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **reinforced concrete beam** show that for all the alternative combinations of actions the recommended reliability of 3.8 is met along all load ratio χ for the upper bound of the imposed load of category B recommended in EN 1991-1-1. For the lower bound of the imposed load the recommended reliability level of 3.8 is met for a range of χ between 0 and 0.7.

Figure 7 - Reliability index β of a **reinforced concrete column** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

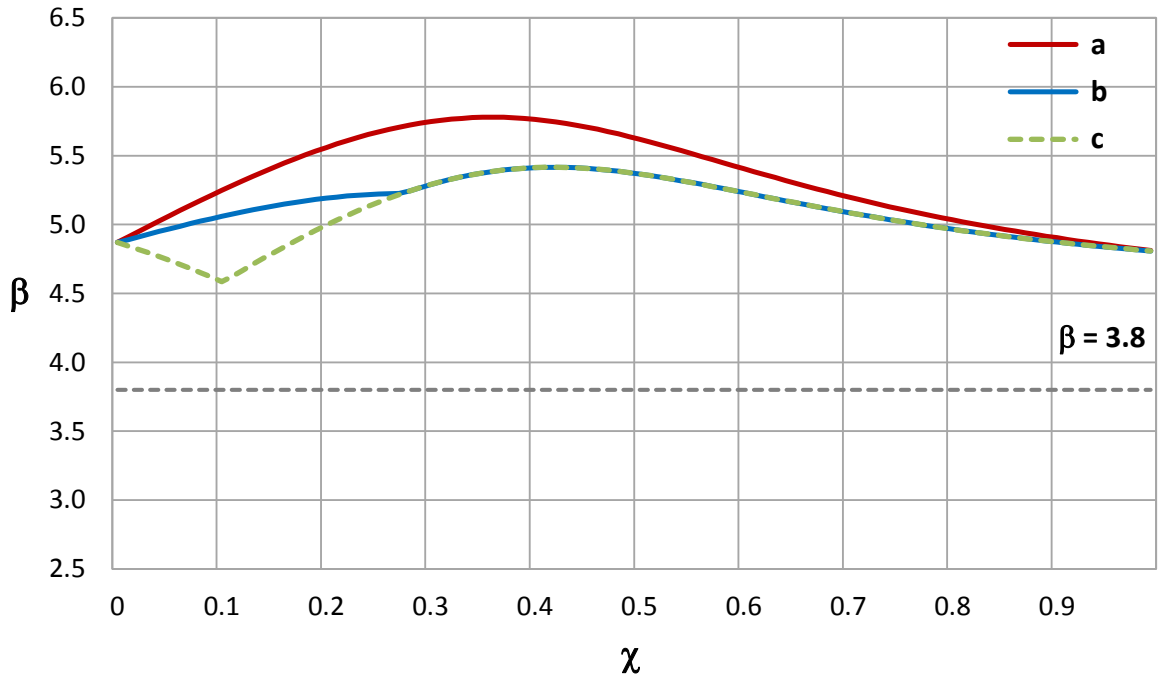
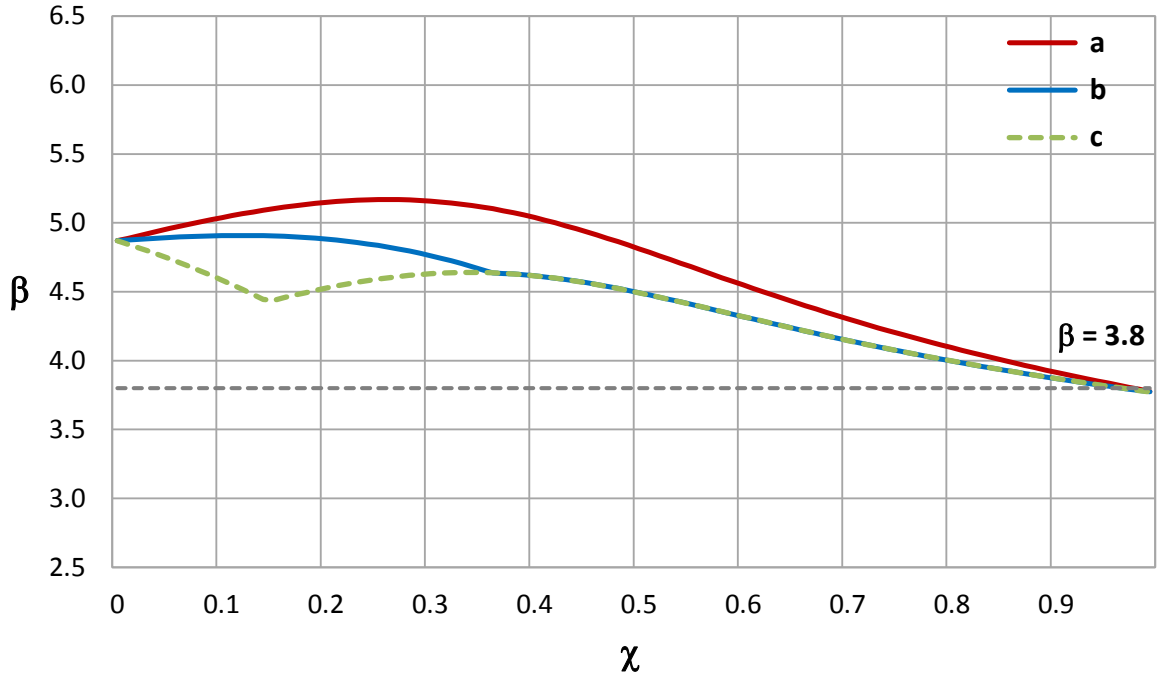


Figure 8 - Reliability index β of a **reinforced concrete column** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **reinforced concrete column** show that for all the alternative combinations of actions the recommended reliability of 3.8 is met along all the considered

range of χ for the upper and lower bounds of the imposed load of category B given in EN 1991-1-1.

Figure 9 - Reliability index β of a **reinforced concrete slab** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

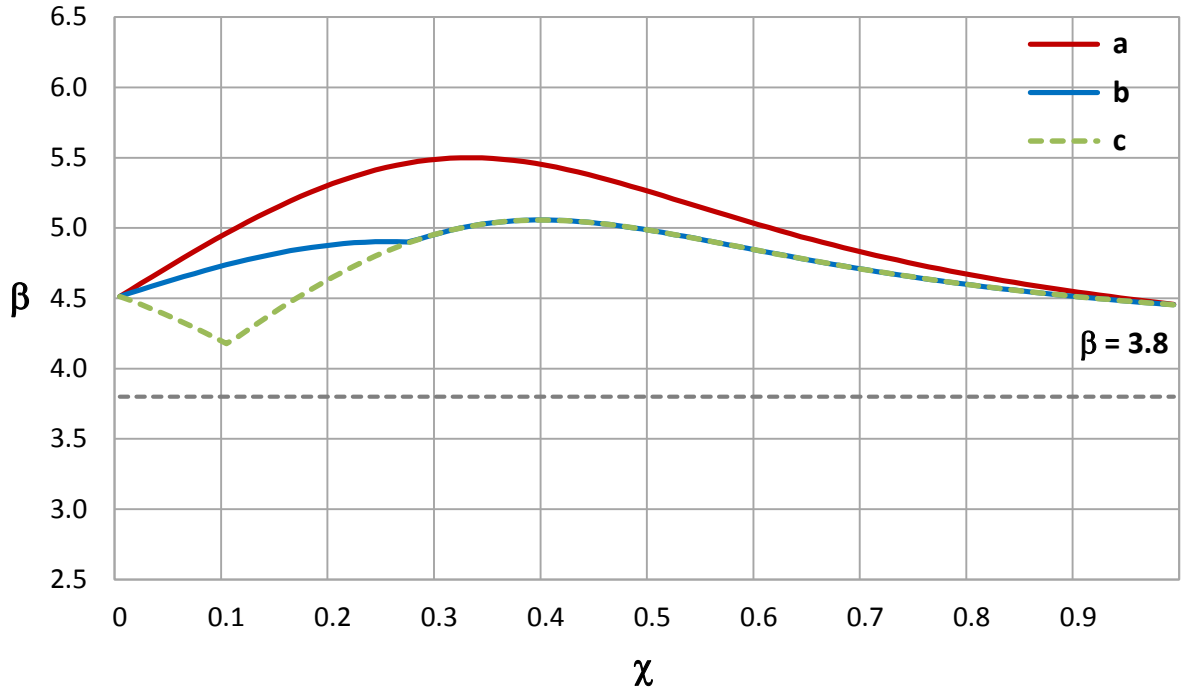
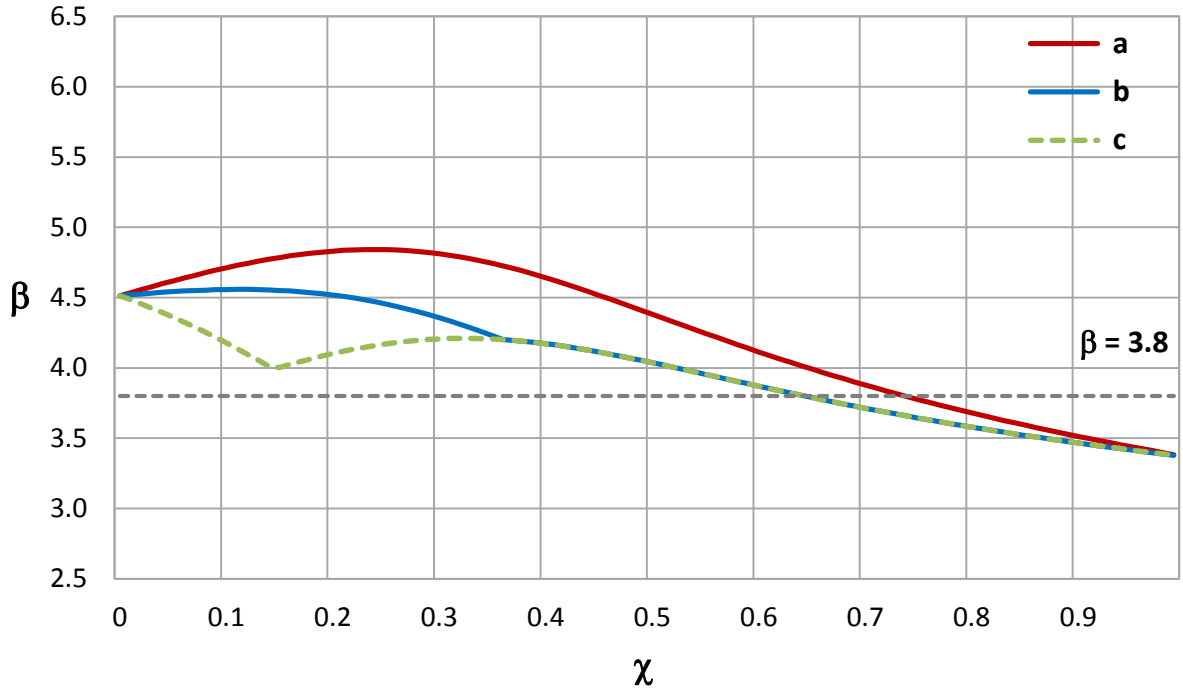


Figure 10 - Reliability index β of a **reinforced concrete slab** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **reinforced concrete slab** show that for all the alternative combinations of actions the recommended reliability of 3.8 is met along all the considered range of χ for the upper bound of the imposed load of category B given in EN 1991-1-1. For the lower

bound of the imposed load, the recommended reliability level of 3.8 is met for a range of χ between 0 and 0.7, for all the alternative combinations of actions.

Figure 11 - Reliability index β of a **composite steel concrete slab** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

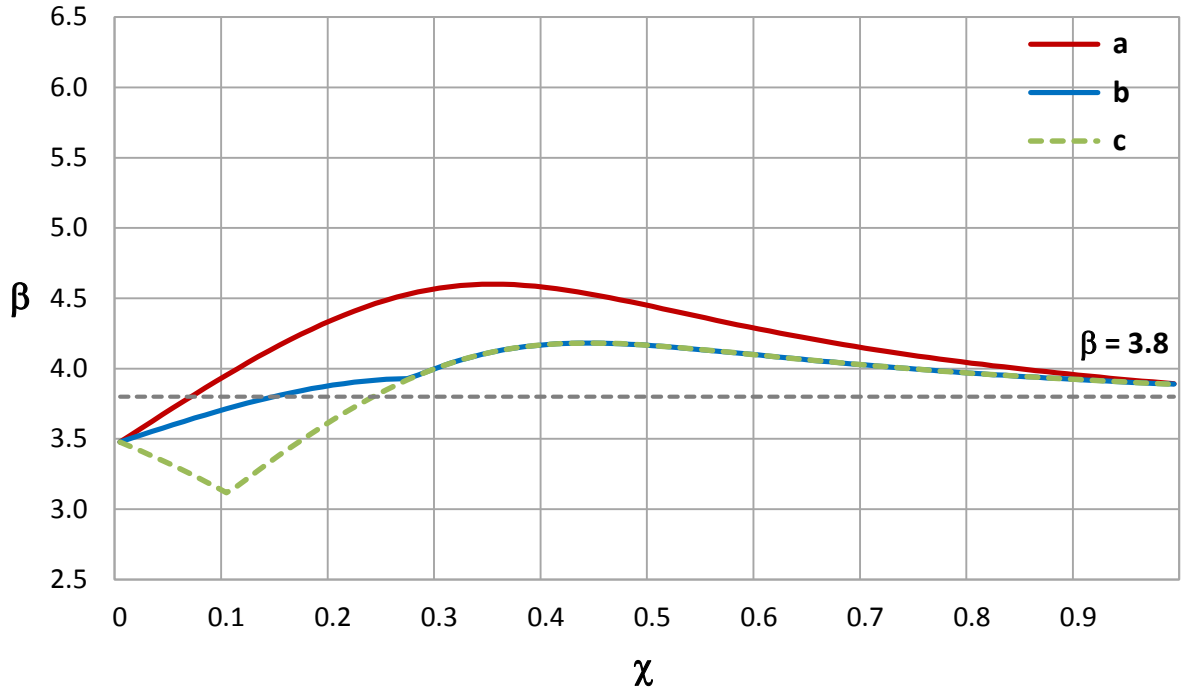
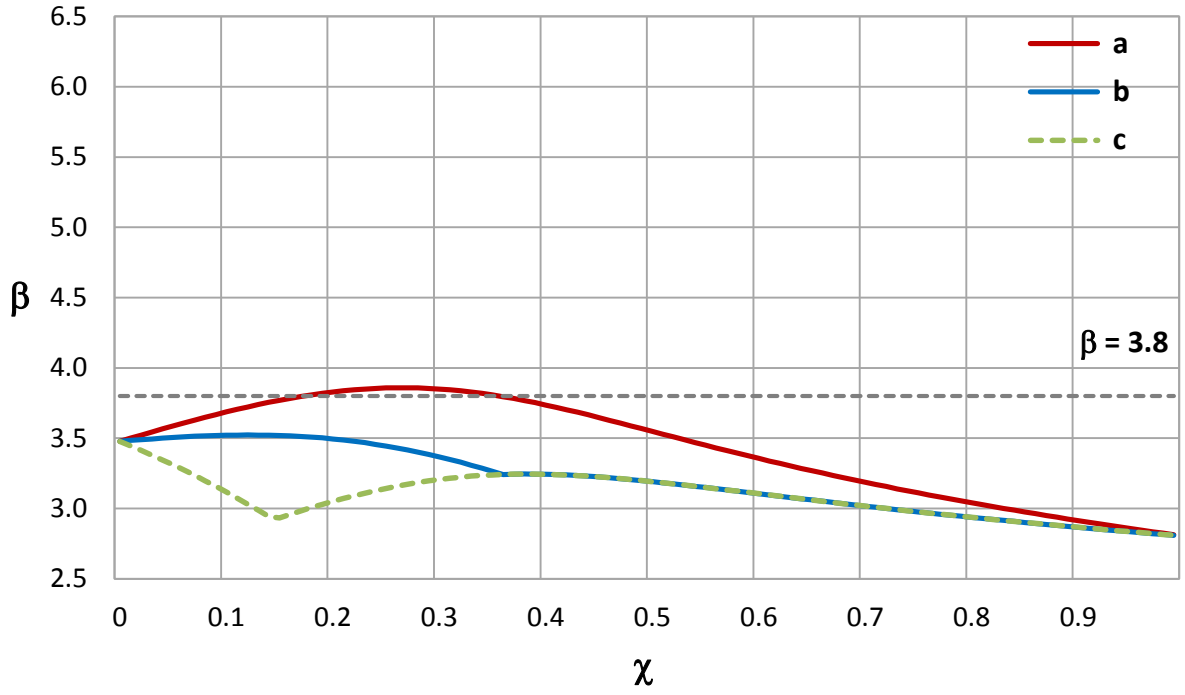


Figure 12 - Reliability index β of a **composite steel concrete slab** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **composite steel concrete slab** show that for the upper bound of the imposed load, the recommended reliability of 3.8 is met along almost the complete range of χ for the alternative combinations rule *a*. For the alternative combination rules *b* and *c* the recommended reliability is met when χ is greater than 0.15 and 0.25, respectively. For the lower bound of the imposed load, the recommended reliability of 3.8 is only met for the application of the alternative combination rule *a* when χ in the range between 0.2 to 0.35.

Figure 13 - Reliability index β of a **steel tie** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

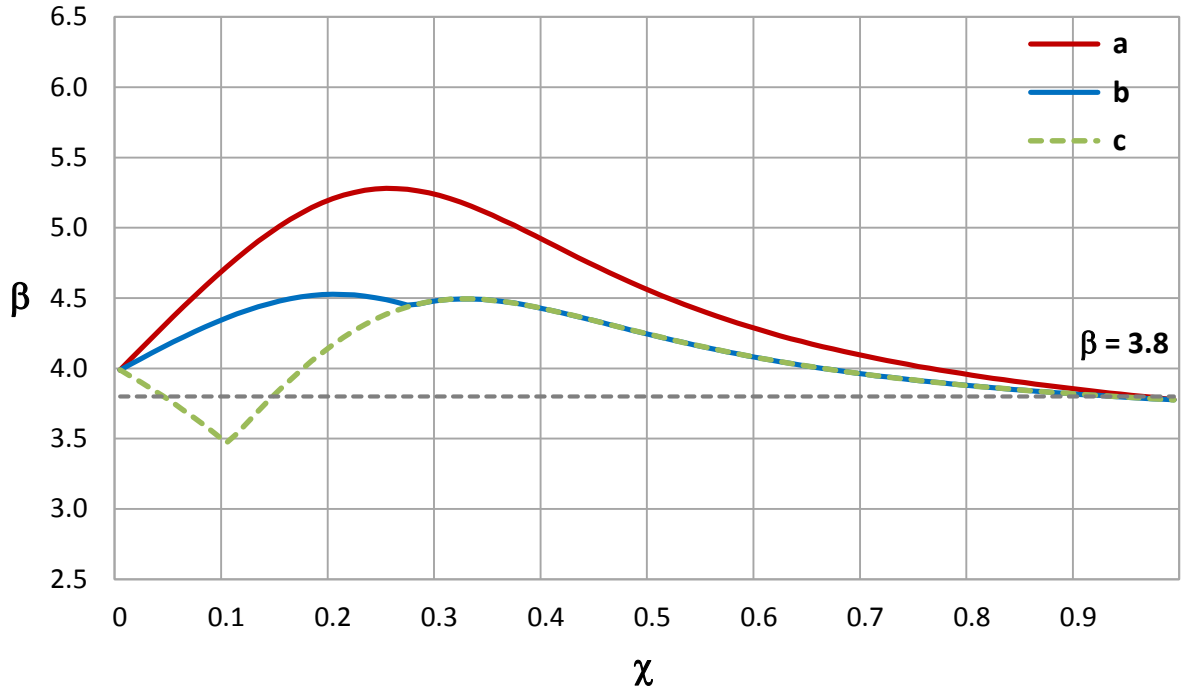
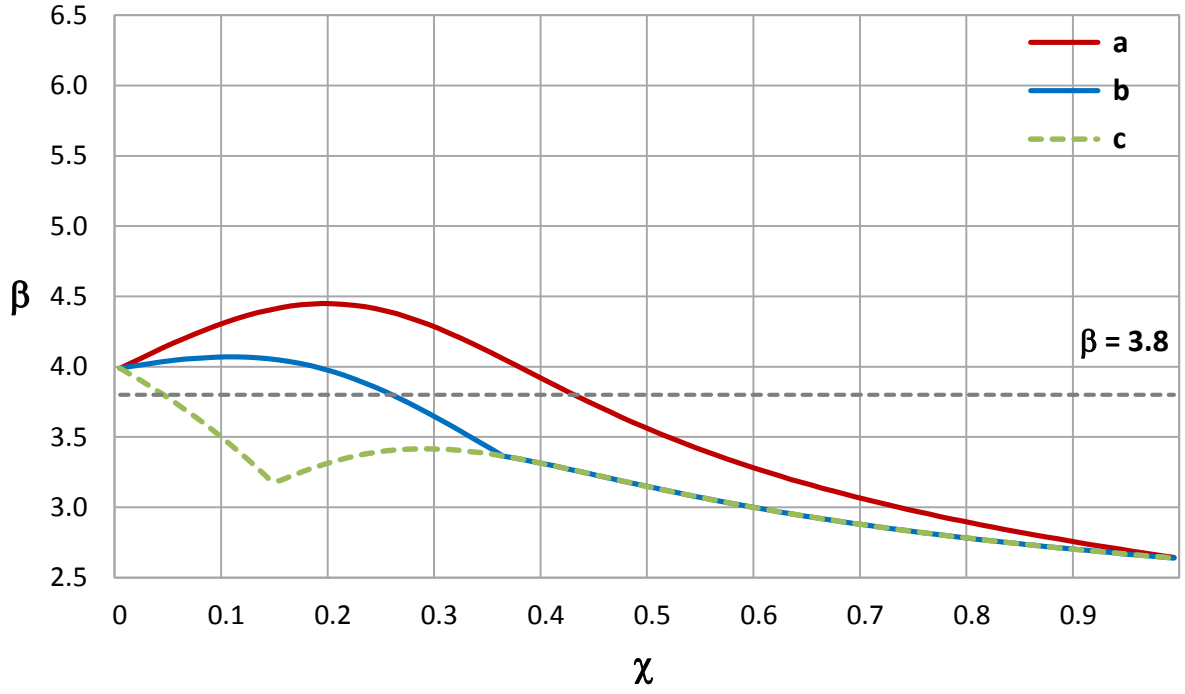


Figure 14 - Reliability index β of a **steel tie** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for a **steel tie** show that for the upper bound of the imposed load the recommended reliability of 3.8 is met along all the considered range of χ, except for the alternative combination rule *c* for prevailing permanent actions when χ is in a range from 0.05 to 0.15. For the lower bound of the imposed load, the recommended reliability of 3.8 is not met for *procedure c*.

Figure 15 - Reliability index β of a **steel column** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

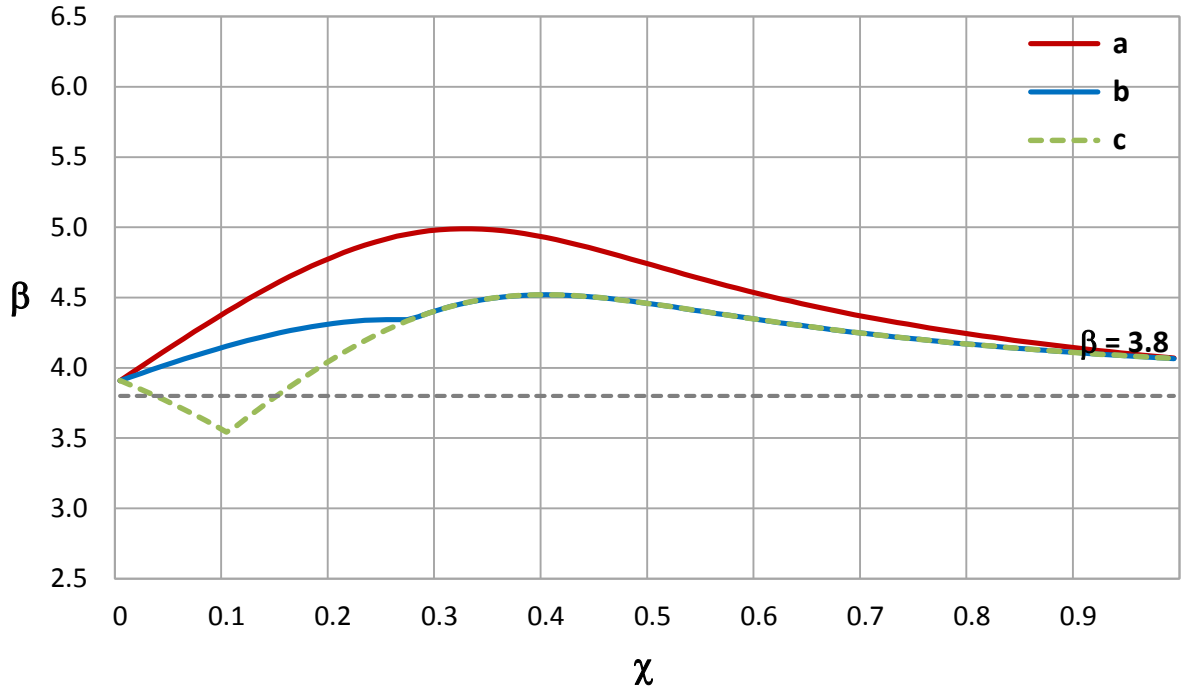
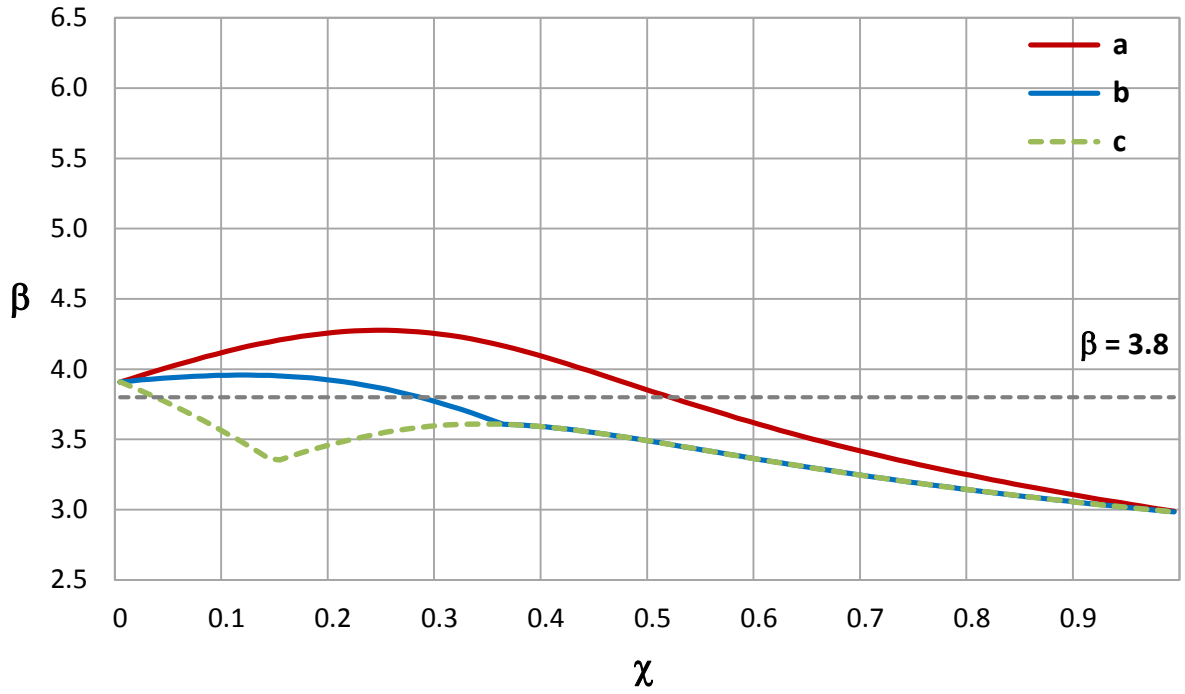


Figure 16 - Reliability index β of a **steel column** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **steel column** show that for the upper bound of the imposed loads the recommended reliability of 3.8 is met along all the considered range of χ, except for the alternative combination rule *c* for prevailing permanent actions when χ is in a range from 0.05 to 0.15. For the lower bound of the imposed load the recommended reliability of 3.8 is met for χ ratios lower than 0.5 and 0.3, when the application of the alternative combination rule *a* and *b* are respectively selected.

Figure 17 - Reliability index β of a **timber beam** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

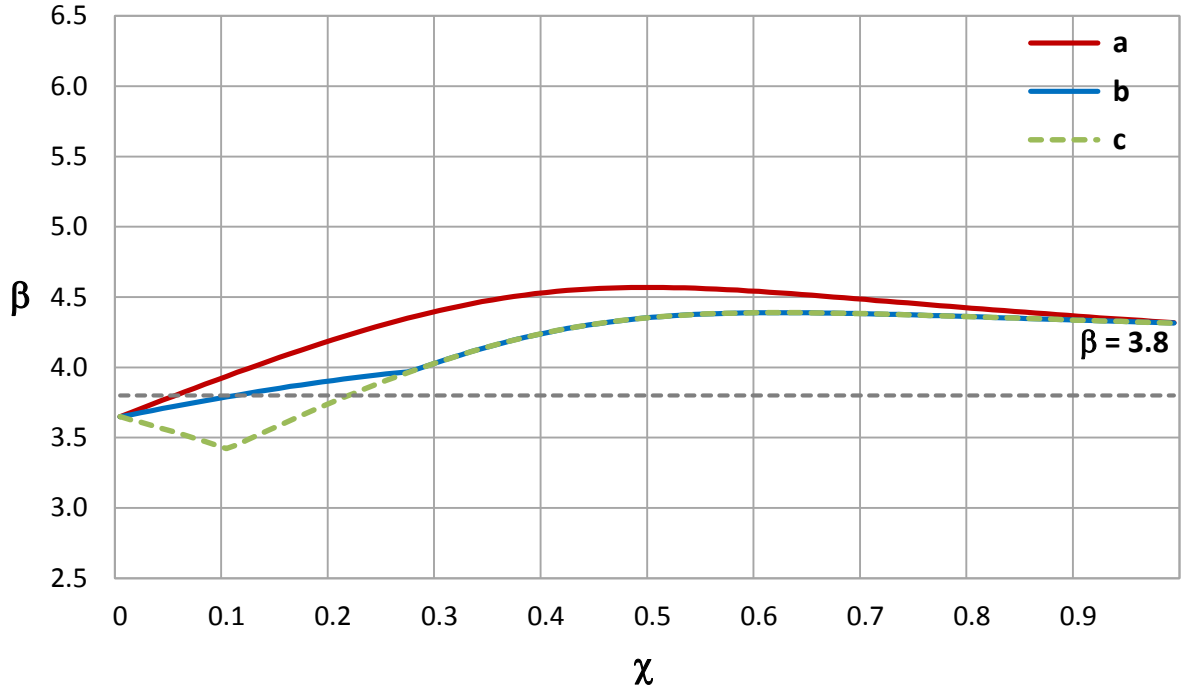
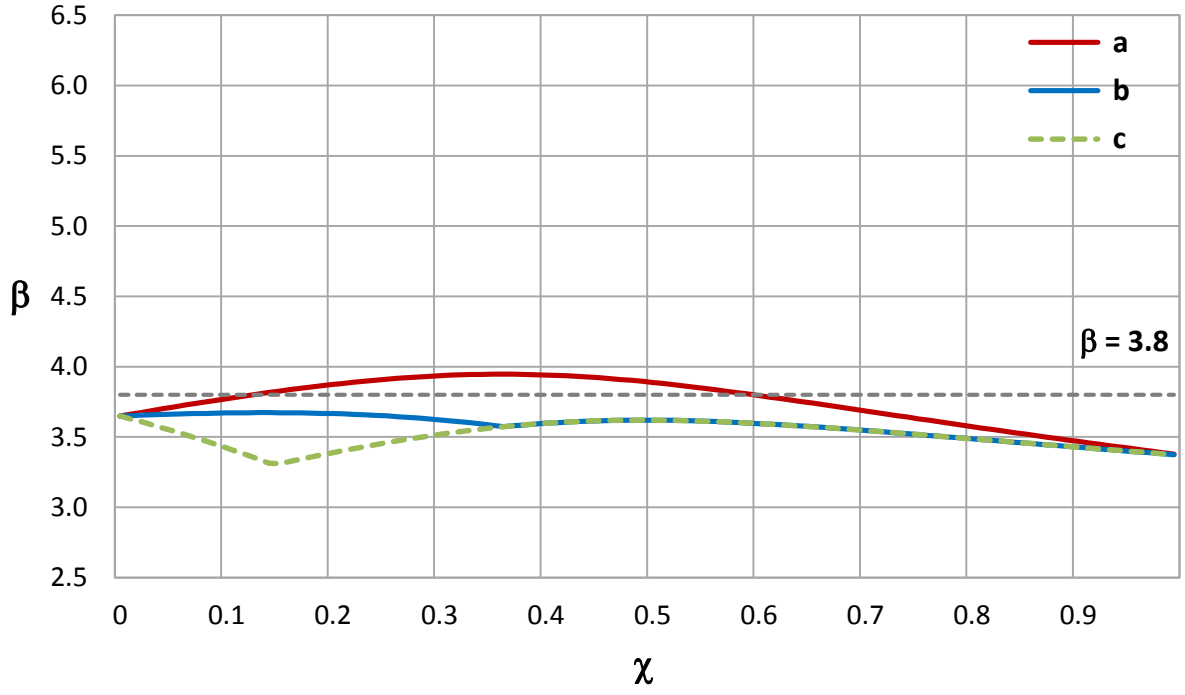


Figure 18 - Reliability index β of a **timber beam** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **timber beam** show that for the upper bound of the imposed load, the recommended reliability of 3.8 is met when applying the alternative combination rule *a* almost over the entire range of χ, and when applying the alternative combination rule *b* for values of χ higher than 0.1. For the lower bound of the imposed load the recommended reliability of 3.8 is met only by the application of alternative combination rule *a* for values of χ between 0.1 and 0.6.

Figure 19 - Reliability index β of a **timber column** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

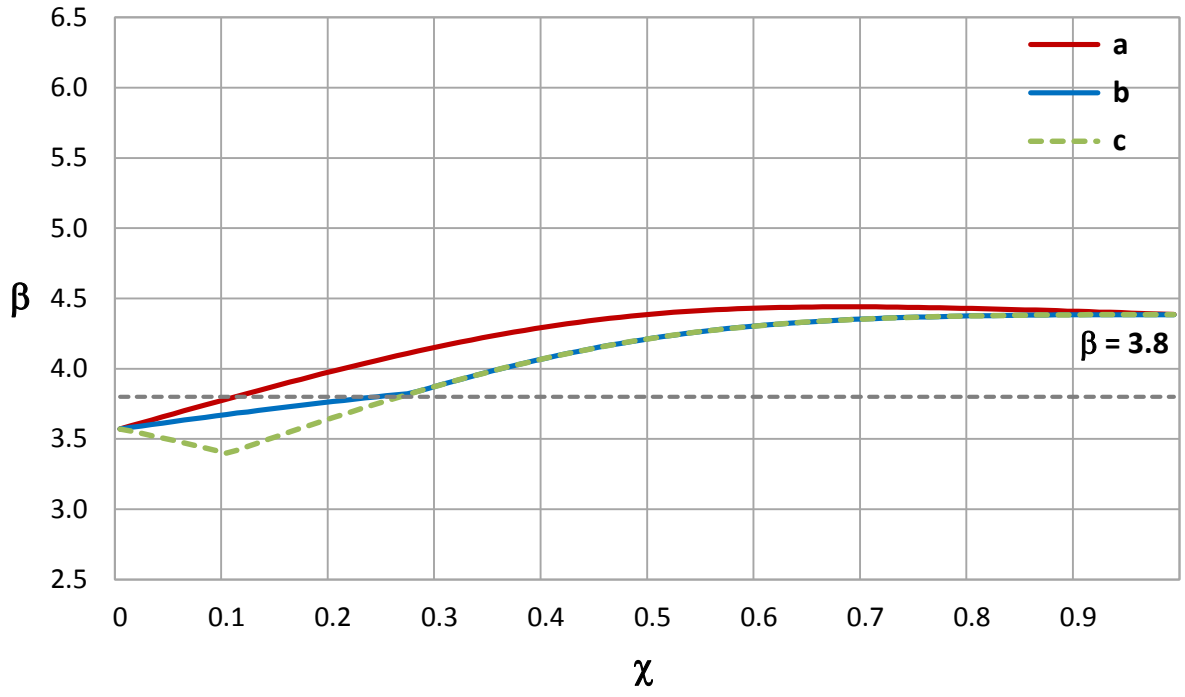
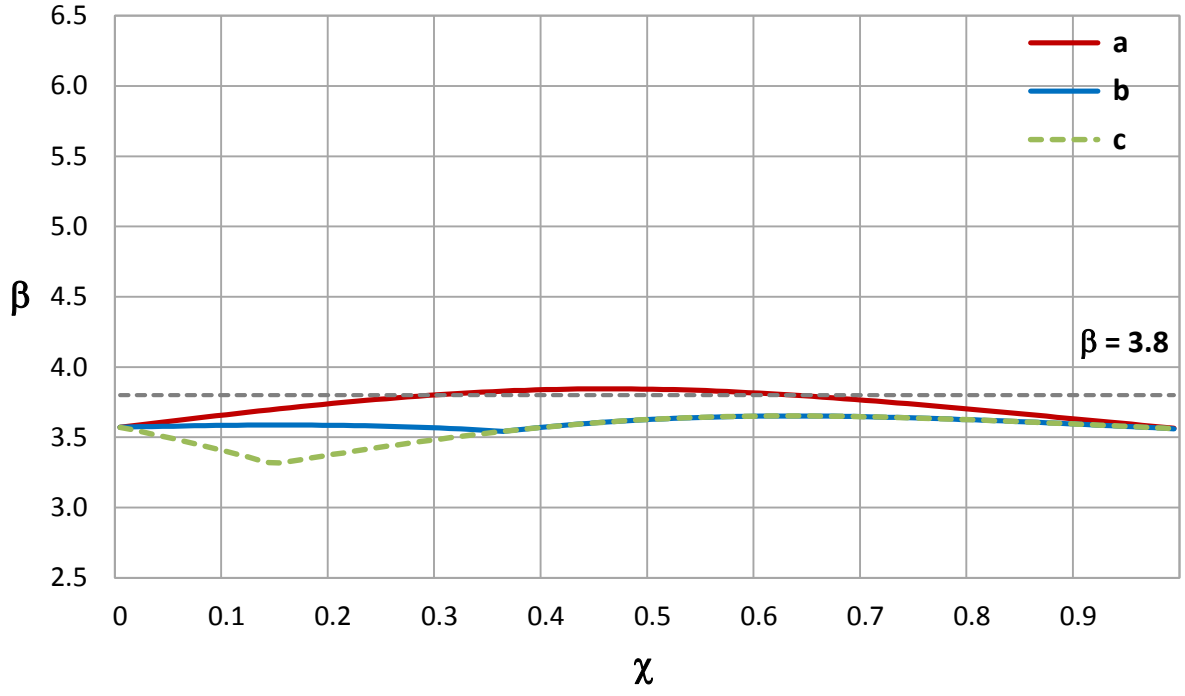


Figure 20 - Reliability index β of a **timber column** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **timber column** show that for the upper bound of the imposed load, the recommended reliability of 3.8 is met by the application of alternative combination rule *a* for $\chi > 0.1$ and by the application of alternative combination rules *b* and *c* for $\chi > 0.25$. For the lower bound of the imposed load the recommended reliability of 3.8 is not met for all the combinations and χ ratios and for *procedure b* and *c*. The alternative combination *a* provides reliability levels slightly above 3.8 for χ between 0.3 and 0.65.

Figure 21 - Reliability index β of a **masonry wall** as a function of the load ratio χ, for the **upper bound** of imposed load of **category B** recommended in EN 1991-1-1.

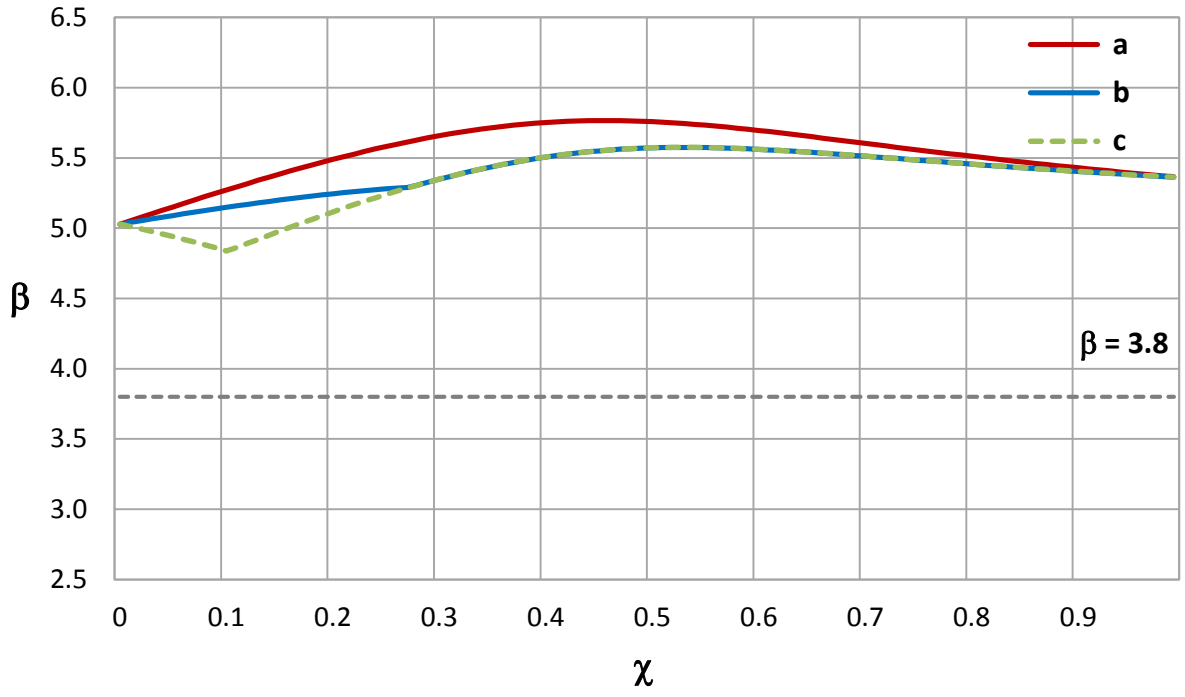
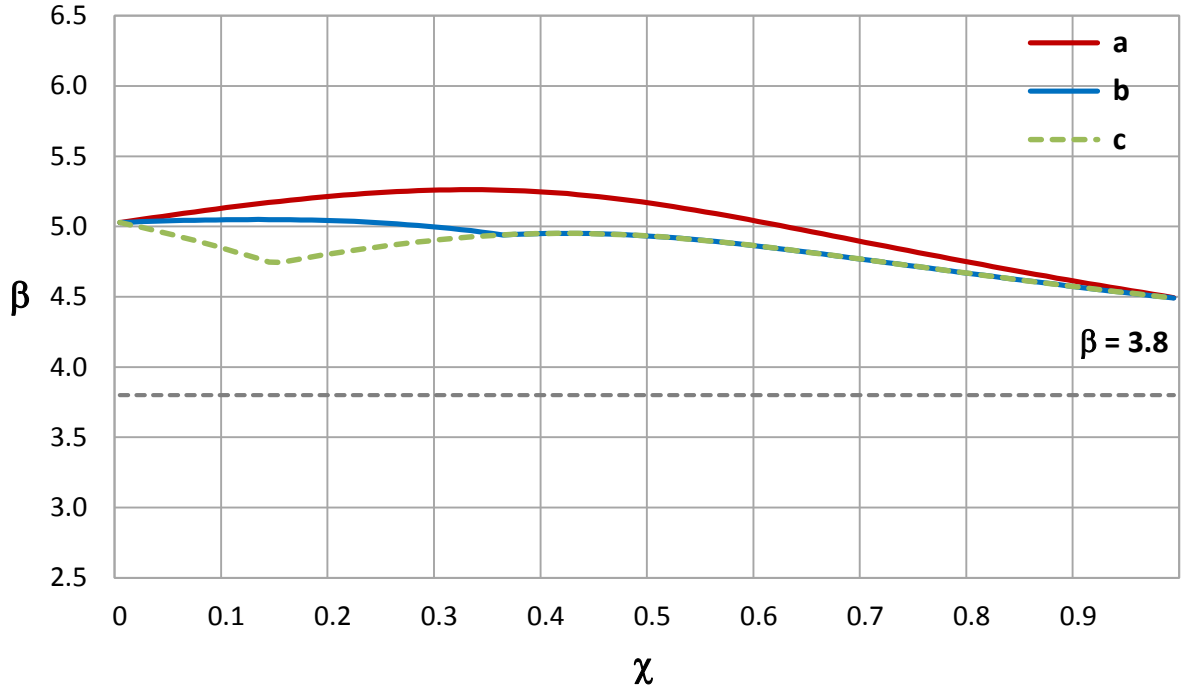


Figure 22 - Reliability index β of a **masonry wall** as a function of the load ratio χ, for the **lower bound** of imposed load of **category B** recommended in EN 1991-1-1.



The results for the **masonry wall** show that for the lower and upper bounds of the imposed loads the recommended reliability of 3.8 is met for all alternative load combinations.

Table 27 presents a summary of the results of the reliability analysis for the selected structural members designed according to CEN NDPs values considering the upper and lower bounds of the characteristic values of imposed load of category B provided in EN 1991-1-1 (see Table 7).

Table 27 - Summary of the results of the reliability analysis for the selected structural members designed according to CEN NDPs values considering the upper and lower bounds of imposed loads of category B provided in EN 1991-1-1

Selected member	**Imposed loads of category B**	**Range of χ for which $\beta > 3.8$**		
		Procedure a	***Procedure b***	***Procedure c***
Reinforced concrete beam	Upper bound	All	All	All
	Lower bound	0 – 0.75	0 – 0.7	0 – 0.7
Reinforced concrete column	Upper bound	All	All	All
	Lower bound	All	All	All
Reinforced concrete slab	Upper bound	All	All	All
	Lower bound	0 – 0.75	0 – 0.7	0 – 0.7
Composite steel concrete slab	Upper bound	> 0.05 (almost all)	> 0.15	> 0.25
	Lower bound	0.2 – 0.35	Not met	Not met
Steel tie	Upper bound	All	All	> 0.15
	Lower bound	0 – 0.45	0-0.25	Not met
Steel column	Upper bound	All	All	> 0.15
	Lower bound	0 – 0.5	0-0.3	Not met
Timber beam	Upper bound	>0.05 (almost all)	> 0.1	> 0.2
	Lower bound	0.1 – 0.6	Not met	Not met
Timber column	Upper bound	> 0.1	> 0.25	> 0.25
	Lower bound	0.3 – 0.65	Not met	Not met
Masonry wall	Upper bound	All	All	All
	Lower bound	All	All	All

Table 27 reveals that, for imposed loads of category B, when the alternative *procedure a* is applied for structural members designed according to CEN NDPs values, the achieved reliability level of structural members comply with the recommended reliability index β_t for the large majority of reasonable values of the load ratio χ.

When the *alternative b* is applied, and for the lower bound of imposed loads recommended in EN 1991-1-1, the reliability levels of composite, steel and timber members are commonly lower than the reliability level recommended in EN 1990.

When the alternative *procedure c* is chosen and the upper bound of imposed load is considered, the recommended reliability level is met in the entire range of the load ratio χ, for the reinforced concrete and masonry members and when the load ratio is greater than 0.2 - 0.3 for composite, steel and timber members. For the alternative *procedure c* and for the lower bound of imposed loads recommended in EN 1991-1-1, the reliability levels of composite, steel and timber members are commonly lower than the reliability level recommended in EN 1990.

7 Conclusions

7.1 Summary of the results

7.1.1 General assumptions

Reliability is defined in the Eurocodes as the ***"ability of a structure or a structural member to fulfil the specified requirements, including the design working life, for which it has been designed".*** The reliability levels of basic structural members designed according to Eurocodes considering the nationally selected NDPs of 20 countries were analysed in this report. The obtained reliability indices β were compared with the Eurocodes recommended requirement, the target reliability index β_t, given in EN 1990 for the reference period of 50 years. The imposed loads considered in the analysis correspond to commonly used categories of loaded areas A to D in buildings, as specified in EN 1991-1-1. Typical buildings whose prevailing area corresponds to these categories of loaded areas are: residential buildings and houses (category A); office buildings (category B); schools (category C1); churches, theatres, cinemas (category C2); museums, exhibition centres (category C3); sports facilities (category C4); concert halls, sports halls (category C5); retails shops (category D1) and department stores (category D2). For common buildings (reliability class RC2) with categories of imposed loads A, B, C1 to C3, D1 and D2, the recommended reliability index is β_t = 3.8, and for buildings in categories C4 and C5, used for sport activities or public gathering spaces (reliability class RC3), the recommended index is β_t = 4.3.

The study encompasses basic structural members considering different materials, as follows:

- reinforced concrete beam, column and slab;

- composite steel concrete slab;

- steel tie and column;

- timber beam and column;

- masonry wall.

The reliability indices are calculated by probabilistic analysis considering the uncertainties in the actions and material properties, and the uncertainties in the modelling of action effects and structural resistance.

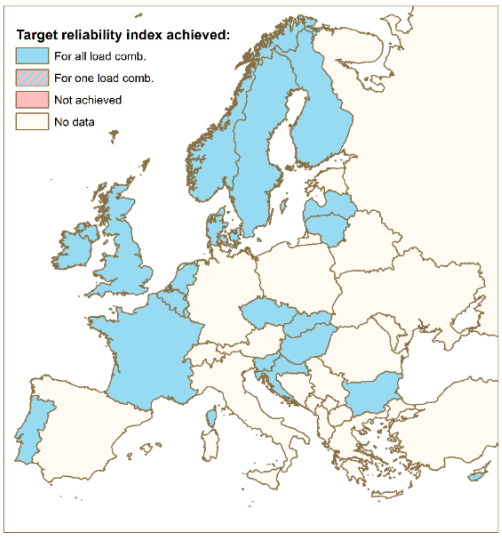
The procedures for fundamental combination of actions, herewith denoted as *procedure a, b*, or *c,* are presented in detail in chapter 3, Table 4.

7.1.2 Reliability of structural members achieved

The reliability indices for a typical load ratio value χ between the characteristic value of the imposed load and the characteristic value of total load equal to 0.4 were obtained, as well as the minimum and maximum values of reliability indices in a common interval of ratio χ, ranging from 0 to 0.7 for categories of imposed loads A to D (section 4.4). The load ratios for which the reliability indices achieved the minimum and the maximum values were also determined.

For the **reinforced concrete members** the vast majority of the **considered countries achieved reliability levels for common buildings** (reliability class RC2) **equal or above the CEN recommended value** of β_t = 3.8 for the typical **load ratio χ = 0.4**. For the categories of loaded areas C4 and C5 (reliability class RC3), the reliability level β_t = 4.3 is also achieved for most countries, as depicted in Figure 23 for the **category C5** and for **a reinforced concrete column**.

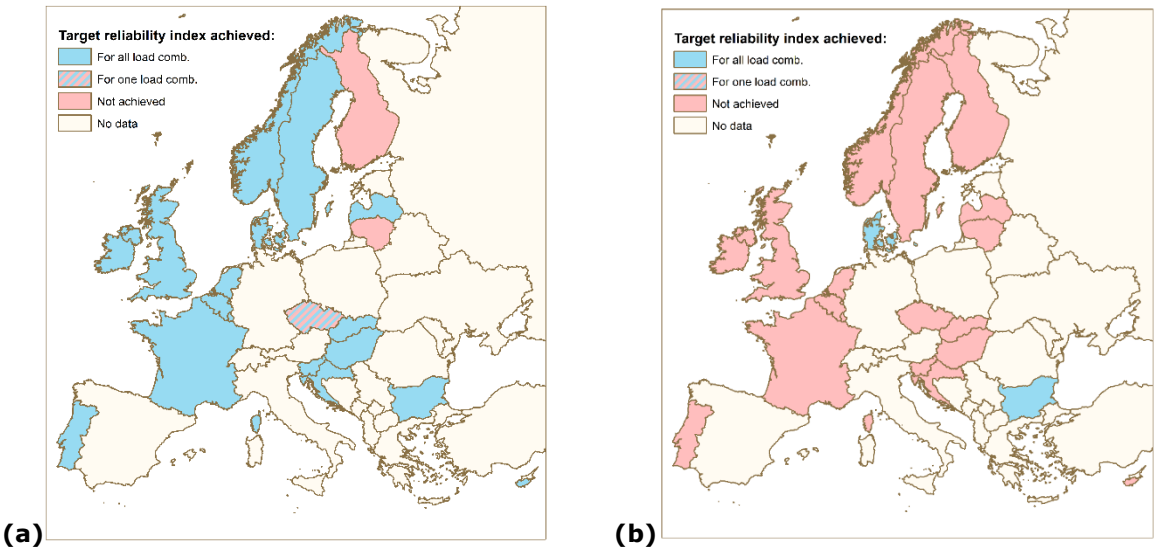
Figure 23 – Achievement of reliability levels by Member States relatively to CEN target values; load ratio χ **= 0.4, reinforced concrete column,** category of imposed loads **C5**



Exceptions were found for the minimum value of the reliability indices obtained for a reinforced concrete beam and a slab for the category of imposed load C5, mainly when *procedure b* is chosen. In this case, the reinforced concrete members designed according to CEN recommended values achieved reliability levels slightly below the recommended level.

For a **composite steel concrete slab,** the results for the typical **load ratio** χ = **0.4** show that for most considered countries the obtained reliability level is **below the CEN recommended reliability level** for **categories of loaded areas C2 and C5**, mainly when ***procedure b*** is chosen. Figure 24(a) illustrates the results for the category of imposed loads **B** and Figure 24(b) for the category of imposed loads **C5**.

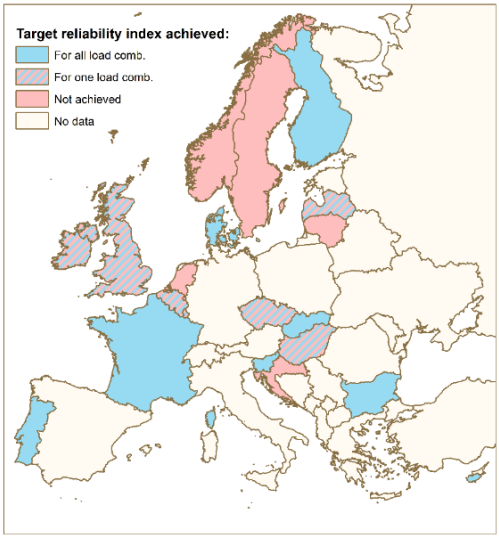
Figure 24 - Achievement of reliability levels by Member States relatively to CEN target values; load ratio χ **= 0.4, composite steel concrete slab, (a)** category of imposed loads **B,** and **(b)** category of imposed loads **C5**



For the **steel column** the reliability level attained by Croatia, Lithuania, the Netherlands, Norway and Sweden **is below the CEN target value** for the **load ratio** χ = **0.4** for the category of **imposed load C5**, as depicted in Figure 25. For the same case, countries like Belgium, the Czech Republic, Hungary, Ireland, Latvia, Luxembourg and the United

Kingdom did not attain the target reliability level, when using *procedure b* for load combination.

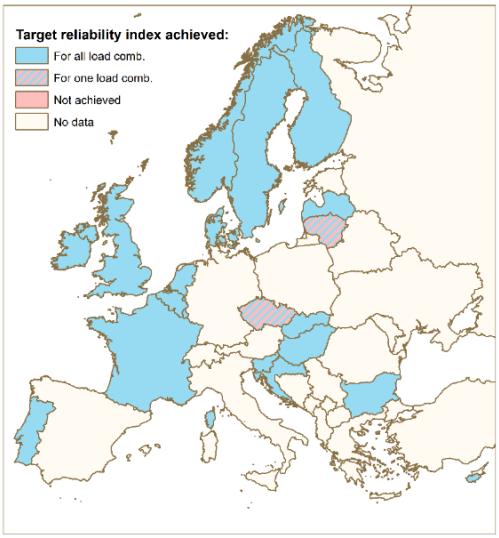
Figure 25 - Achievement of reliability levels by Member States relatively to CEN target values; load ratio χ **= 0.4, steel column,** category of imposed loads **C5**



When designed according to **CEN recommended values**, the considered **steel and composite structural members** exhibit reliability below the recommended level for **category C5** for the typical load ratio χ = 0.4 **when using *procedure b*** for load combination. On the other hand, countries like Bulgaria, which have chosen the upper bound of the imposed load interval for C5 and adopted a higher value of partial factor for structural steel than the RV in EN 1993-1-1, commonly achieved the CEN recommended reliability level.

For the **timber beam** and **column** the results show that **most considered countries achieved the CEN recommended reliability level** for **categories of loaded areas A, B, C1, C3, D1 and D2** for the typical **load ratio** χ = **0.4.** Figure 26 illustrates the results for a **timber beam** for the typical load ratio χ = **0.4** and category of **imposed loads A.**

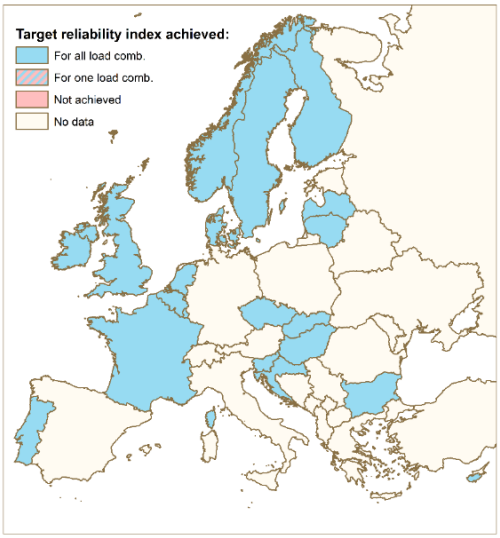
Figure 26 - Achievement of reliability levels by Member States relatively to CEN target values; load ratio χ **= 0.4, timber beam,** category of imposed loads **A**



For the **category C5** for the timber beam **the reliability level** for the **typical load ratio** $\chi = 0.4$ **is below the CEN recommended reliability level** when using CEN recommended values and for all considered countries, except Bulgaria. Similar result is obtained when using the CEN recommended values for a **timber column** for **categories C2, C4 and C5**.

The results show that for the **masonry wall,** made of solid bricks and general mortar, the reliability levels of the vast majority of the considered countries **satisfy the CEN recommended value, for all categories of use,** as shown in Figure 27 for **category A**.

Figure 27 - Achievement of reliability levels by Member States relatively to CEN target values; load ratio χ **= 0.4, masonry wall** category of imposed loads **A**



A single exception occurs for the Netherlands for category of use C5 for $\chi = 0.4$. The reliability levels achieved with the recommended by CEN values have met the recommended values in all instances.

The results show that the reliability of selected basic structural members designed according to the national choices of the NDPs varies in a rather broad range in the different countries and for the different materials:

— **Denmark** set up in its National Annex of EN 1990 a target reliability index β_t = 4.3 for the class RC2 of structural members, and β_t = 4.7 for the class RC3 for the reference period of 1 year, which correspond to $\boldsymbol{\beta_t}$ **= 3.3** for the class RC2, and $\boldsymbol{\beta_t}$ **= 3.8** for the class RC3 for a reference period of 50 years. **All the other considered countries accepted** the CEN recommended values of $\boldsymbol{\beta_t}$ **= 3.8** for the class RC2 of structural members, and $\boldsymbol{\beta_t}$ **= 4.3** for the class RC3 for a reference period of 50 years.

— In most cases the **reliability achieved** with the **choice of the NDPs by the countries** is **equal or lower the one achieved with the CEN recommended values**. However, in some cases the country choices of the NDPs provide higher reliability, as for example for the masonry wall for $\chi = 0.4$, where for each category of use at least 8 countries achieved higher reliability than the one calculated with the CEN recommended values.

— The reliability achieved with the country choices of the NDPs is different for the different materials. The **vast majority** of the countries achieved the target reliability for **reinforced concrete and masonry members,** while several countries **did not achieve the target reliability for composite, steel and timber members** for several categories of use.

The reliability indices calculated in the present study for the typical load ratio $\chi = 0.4$ vary from 2.9 to 6.8, the former value was obtained by Latvia for the composite steel concrete slab for category of use C2 and for the *combination procedure b* and the latter value was

obtained by the United Kingdom for the masonry wall for category of use C4 and for the *combination procedure a*. The smallest value of the minimum reliability index is β_{min} = 2.2. It was detected for a steel tie for category of use A for Croatia and load ratio $\chi = 0$, (*i.e.* no imposed load applied), which is more academic, than practical case. It should be noted, that the **reliability of whole structure is normally higher than the one of a structural member**. Thus, the presented results show that a **generally good level** of structural reliability has been **achieved with the country choices of the NDPs.**

7.1.2 Other results

Reliability analysis of a steel tie and a steel column was performed in section 4.2 for a **typical load ratio χ = 0.3** and compared with the results for χ = 0.4 used in the study encompassing all the materials considered. The reliability levels obtained for the load ratio $\chi = 0.3$ for a steel tie are generally equal or slightly higher than the reliability levels obtained for $\chi = 0.4$, for almost all building categories, except for C2. Similar results are obtained for a steel column, where reliability levels obtained for the load ratio $\chi = 0.3$ are slightly higher than those obtained for $\chi = 0.4$, for almost all building categories, except for C2 and C5. These facts give reasons to consider the reliability levels of steel members for a typical load ratio of $\chi = 0.4$ in section 4.4 as slightly conservative.

The influence of the **selection of the probabilistic model of concrete compressive strength** on resulting reliability indices was analysed considering a two parameter lognormal distribution and a common coefficient of variation of 0.10 (section 4.3). The lower and upper bounds of the considered coefficient of variation of the model uncertainty were 0.05 and 0.15, respectively, representing a higher and a lower quality of concrete production and execution on site (section 4.3). In the vast majority of cases, the reliability level of the reinforced concrete members satisfy the reliability levels recommended in EN 1990. However, results show that high values (0.15) of the coefficient of variation of the model uncertainty have influence on the reliability of concrete members for the category of use C5 where, for the reinforced concrete beam, 13 out of 20 countries do not fulfil the reliability level recommended in EN 1990, mainly when the load *combination procedure b* is adopted. For this situation, also the reliability level obtained with CEN recommended values is 11% below the recommended level. For the reinforced concrete column, the large majority of countries have met the recommended reliability level.

The analysis of the **influence of the combination factor ψ_0** on the reliability was performed for two structural members, a concrete column and a steel column (chapter 5) considering a combination of two imposed loads. Only two countries, Denmark and the Netherlands, are using combination factors different from the recommended values for different classes of imposed loads (see Table 9). The results indicated that the **reliability of structural members designed for the combination of two imposed loads is consistent with the requirements** in EN 1990 for the reliability level. Also shown was that the higher the values of the combination factor ψ_0, the greater the reliability levels obtained.

Finally, reliability analysis for the selected structural members designed according to **CEN NDPs values** considering the **upper and lower bounds of the characteristic values of imposed loads** provided in EN 1991-1-1 was performed for category of use B (chapter 6). The results revealed that for the alternative *procedure a*, the achieved reliability levels are greater than the recommended reliability for almost the entire range of the load ratio χ. The reliability levels of composite, steel and timber members, being designed according to the **lower bound** of imposed loads recommended in EN 1991-1-1, are commonly lower than the reliability level recommended in EN 1990, when alternative *procedures b* and *c* are chosen. A summary of the results may be found in Table 27.

7.2 The way ahead

The analyses performed in the current report indicate that the reliability of selected structural members, which were designed according to the national choice of the reliability

elements (NDPs) varies in a rather broad range. The reliability levels of the structural members for most common categories of imposed loads match the reliability indices recommended in EN 1990. However, in some cases the reliability levels are below the CEN target value and therefore should be further analysed and calibrated.

Special attention should be given to country choices related to composite members, for the categories of imposed loads C2 and C5, to steel members for the category C5, and to timber structural members for the categories C2, C4 and C5, especially when *procedure b* for the fundamental combination of actions (expressions 6.10a & 6.10b of EN 1990) **is used.**

The reliability levels achieved using **CEN recommended values should also be studied further**, in order to delineate eventual needs for calibration of the recommended values, especially when *procedure b* (expressions 6.10a & 6.10b of EN 1990) for the fundamental combination of actions is chosen.

The **rather broad interval of imposed loads for categories A to D** presently recommended in the Eurocodes should be further analysed and **narrowed down**.

The application of the *procedure b* for the fundamental combination of actions (expressions 6.10a & 6.10b of EN 1990), leads to a more uniform reliability level along the considered range of ratio χ of the variable loads to the total load, than the application of the unique combination, *i.e.*, *procedure a* (expression 6.10 of EN 1990). However, **the application of the *procedure b* for imposed loads of categories C2, C4 and C5** shall be allowed **after a careful calibration** of the chosen NDPs with regard to the recommended reliability levels.

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Annexes

Annex A. Reliability levels in percentage of CEN target values

Table 28 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio χ **= 0.4**, considering the categories of imposed loads A to D2 – **reinforced concrete beam**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***10.3***	***29.4***	***38.2***	***20.6***	***44.9***	***46.6***	***14.0***	***32.4***	***40.3***	***20.6***	***33.7***	***34.2***	***20.0***	***38.2***	***42.6***	***19.4***	***34.5***	***34.9***	***0.9***	***16.8***	***20.9***	***15.9***	***34.7***	***36.9***	***20.6***	***43.3***	***43.5***	***a+b***
BEL	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	20.6	45.6	46.6	20.6	43.3	43.5	a+b
BGR	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	19.4	39.1	39.2	15.9	34.7	36.9	20.6	43.3	43.5	a
CYP	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	20.6	45.6	46.6	20.6	43.3	43.5	a
CZE	-0.5	20.1	31.5	16.1	34.7	37.7	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	20.6	45.6	46.6	20.6	43.3	43.5	a+b
DNK*	9.3	20.6	23.3	11.2	35.8	35.9	11.3	25.2	26.3	3.9	31.5	44.6	11.5	42.9	42.9	8.9	33.9	36.0	0.6	10.1	21.5	12.8	49.1	50.0	10.3	45.2	47.8	c
FIN	7.4	20.1	23.2	10.0	23.5	23.8	0.5	13.6	20.6	0.4	6.1	20.6	5.6	18.0	20.6	8.3	23.7	23.9	5.6	16.8	19.4	8.7	22.7	22.8	9.4	31.7	32.1	c
FRA	-0.5	20.1	31.5	16.1	34.7	37.7	3.7	23.4	33.5	20.6	33.7	34.2	9.1	28.6	34.8	19.4	34.5	34.9	9.6	22.8	24.3	20.6	45.6	46.6	20.6	43.3	43.5	a
GBR	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	15.9	34.7	36.9	15.2	31.7	33.2	a+b
HRV	-10.2	17.7	19.7	-10.2	32.0	32.0	-10.2	21.1	22.7	-10.2	17.0	24.5	-10.2	26.0	26.4	-8.0	20.8	21.5	-8.0	0.6	0.7	-10.2	5.8	6.2	-10.2	28.6	29.6	a
HUN	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	15.9	34.7	36.9	20.6	43.3	43.5	a+b
IRL	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	15.9	34.7	36.9	20.6	43.3	43.5	a+b
LTU	-7.9	14.1	27.9	-5.7	17.1	25.4	5.9	25.3	34.8	16.7	24.2	24.6	11.4	30.6	36.4	11.6	27.0	28.5	-9.3	10.2	19.4	7.3	27.6	31.4	19.2	34.9	35.9	a+b
LUX	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	20.6	45.6	46.6	20.6	43.3	43.5	a+b
LVA	10.3	29.4	38.2	16.1	34.7	37.7	3.7	23.4	33.5	10.9	20.5	22.2	9.1	28.6	34.8	19.4	34.5	34.9	9.6	22.8	24.3	15.9	34.7	36.9	20.6	43.3	43.5	a+b
NLD	2.8	17.7	22.9	13.4	26.5	27.2	14.3	28.1	31.6	10.1	24.0	27.6	17.1	31.2	32.7	13.1	26.6	26.6	-3.1	7.5	19.4	13.0	25.9	26.3	11.9	22.3	22.4	b
NOR	8.1	22.6	27.6	20.6	37.4	37.6	11.9	25.8	29.6	16.9	24.0	27.6	17.8	31.2	32.7	18.4	26.6	26.6	-3.1	7.5	19.4	20.6	37.6	37.6	20.6	34.8	34.9	b
PRT	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	9.6	22.8	24.3	15.9	34.7	36.9	20.6	43.3	43.5	a
SVK	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	15.9	34.7	36.9	20.6	43.3	43.5	a
SVN	10.3	29.4	38.2	20.6	44.9	46.6	14.0	32.4	40.3	20.6	33.7	34.2	20.0	38.2	42.6	19.4	34.5	34.9	0.9	16.8	20.9	15.9	34.7	36.9	20.6	43.3	43.5	a
SWE	8.1	22.6	27.6	13.4	26.5	27.2	1.3	16.2	24.7	13.4	17.1	20.6	6.5	20.8	24.7	14.9	23.8	23.8	-3.1	7.5	19.4	13.0	25.9	26.3	20.6	34.8	34.9	b
CEN	***7.3***	***20.0***	***27.6***	***20.6***	***34.5***	***34.6***	***11.1***	***23.3***	***28.5***	***15.3***	***20.3***	***25.8***	***17.0***	***28.5***	***29.3***	***17.3***	***23.5***	***23.8***	***-4.5***	***3.9***	***19.4***	***11.9***	***22.5***	***25.2***	***20.6***	***31.5***	***32.0***	***a+b***
BEL	7.3	20.0	27.6	20.6	34.5	34.6	11.1	23.3	28.5	15.3	20.3	25.8	17.0	28.5	29.3	17.3	23.5	23.8	-4.5	3.9	19.4	20.6	34.5	34.6	20.6	31.5	32.0	a+b
CZE	-4.0	9.8	24.0	12.4	23.3	25.7	11.1	23.3	28.5	15.3	20.3	25.8	17.0	28.5	29.3	17.3	23.5	23.8	-4.5	3.9	19.4	20.6	34.5	34.6	20.6	31.5	32.0	a+b
GBR	8.8	24.8	30.5	20.6	39.8	40.4	12.6	27.9	33.0	18.3	27.2	29.4	18.5	33.5	35.8	19.3	29.2	29.2	-1.8	10.5	19.4	13.9	28.7	29.6	13.0	25.4	25.7	a+b
HUN	7.3	20.0	27.6	20.6	34.5	34.6	11.1	23.3	28.5	15.3	20.3	25.8	17.0	28.5	29.3	17.3	23.5	23.8	-4.5	3.9	19.4	11.9	22.5	25.2	20.6	31.5	32.0	a+b
IRL	7.3	20.0	27.6	20.6	34.5	34.6	11.1	23.3	28.5	15.3	20.3	25.8	17.0	28.5	29.3	17.3	23.5	23.8	-4.5	3.9	19.4	11.9	22.5	25.2	20.6	31.5	32.0	a+b
LTU	-11.7	3.2	22.3	-10.5	3.8	20.8	2.7	15.5	25.4	8.2	9.9	20.6	8.0	20.1	25.5	7.3	15.3	19.7	-15.4	-3.5	19.4	2.8	14.7	22.6	14.8	22.3	23.2	a+b
LUX	7.3	20.0	27.6	20.6	34.5	34.6	11.1	23.3	28.5	15.3	20.3	25.8	17.0	28.5	29.3	17.3	23.5	23.8	-4.5	3.9	19.4	20.6	34.5	34.6	20.6	31.5	32.0	a+b
LVA	7.3	20.0	27.6	12.4	23.3	25.7	0.5	13.5	24.7	4.3	5.9	20.6	5.6	17.9	24.7	17.3	23.5	23.8	4.6	10.4	19.4	11.9	22.5	25.2	20.6	31.5	32.0	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 29 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio **χ = 0.4**, considering the categories of imposed loads A to D2 – **reinforced concrete column**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***19.8***	***38.5***	***44.3***	***28.2***	***51.7***	***52.1***	***23.4***	***41.3***	***46.2***	***28.2***	***39.1***	***40.0***	***28.2***	***46.3***	***48.3***	***23.8***	***38.1***	***38.1***	***10.3***	***22.4***	***25.0***	***25.9***	***42.3***	***43.1***	***28.2***	***49.2***	***49.2***	***a+b***
BEL	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	28.2	52.0	52.1	28.2	49.2	49.2	a+b
BGR	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	23.8	41.2	41.9	25.9	42.3	43.1	28.2	49.2	49.2	a
CYP	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	28.2	52.0	52.1	28.2	49.2	49.2	a
CZE	9.5	30.0	38.1	26.0	42.6	43.9	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	28.2	52.0	52.1	28.2	49.2	49.2	a+b
DNK*	16.9	28.8	29.6	18.4	41.7	42.4	18.6	33.0	33.5	12.2	35.4	48.4	18.7	48.7	48.8	13.2	35.7	39.5	6.2	14.7	23.8	19.8	53.2	55.4	17.7	49.1	53.4	c
FIN	17.0	30.0	32.1	19.3	32.6	32.6	10.5	24.1	28.2	11.2	16.1	28.2	15.8	28.0	28.8	14.6	28.8	29.8	12.4	22.4	23.8	18.2	31.7	31.7	18.8	39.1	40.3	c
FRA	9.5	30.0	38.1	26.0	42.6	43.9	13.6	33.1	40.0	28.2	39.1	40.0	19.1	37.6	41.2	23.8	38.1	38.1	18.3	27.5	28.1	28.2	52.0	52.1	28.2	49.2	49.2	a
GBR	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	25.9	42.3	43.1	25.7	39.1	39.6	a+b
HRV	2.3	27.8	29.2	2.3	40.2	40.4	2.3	30.9	31.9	2.3	25.2	32.9	2.3	35.3	35.3	1.0	26.3	27.9	1.0	8.7	8.7	2.3	16.8	16.9	2.3	36.5	38.3	a
HUN	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	25.9	42.3	43.1	28.2	49.2	49.2	a+b
IRL	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	25.9	42.3	43.1	28.2	49.2	49.2	a+b
LTU	2.5	24.6	34.7	5.5	26.9	32.4	15.7	34.8	41.2	26.2	31.1	31.3	21.3	39.4	42.6	20.3	31.7	32.0	1.0	16.8	23.8	17.8	36.1	37.9	28.2	41.9	42.1	a+b
LUX	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	28.2	52.0	52.1	28.2	49.2	49.2	a+b
LVA	19.8	38.5	44.3	26.0	42.6	43.9	13.6	33.1	40.0	21.1	28.1	29.3	19.1	37.6	41.2	23.8	38.1	38.1	18.3	27.5	28.1	25.9	42.3	43.1	28.2	49.2	49.2	a+b
NLD	12.6	27.9	31.5	23.5	35.3	35.4	23.7	37.3	39.5	19.3	31.0	35.4	25.2	39.9	40.5	18.6	31.3	31.8	6.8	14.5	23.8	23.1	34.5	34.6	22.6	31.0	31.0	b
NOR	17.7	32.3	35.2	28.2	45.0	45.0	21.4	35.3	37.6	24.9	31.0	35.4	27.4	39.9	40.5	23.8	31.3	31.8	6.8	14.5	23.8	28.2	44.9	45.0	28.2	41.8	42.5	b
PRT	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	18.3	27.5	28.1	25.9	42.3	43.1	28.2	49.2	49.2	a
SVK	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	25.9	42.3	43.1	28.2	49.2	49.2	a
SVN	19.8	38.5	44.3	28.2	51.7	52.1	23.4	41.3	46.2	28.2	39.1	40.0	28.2	46.3	48.3	23.8	38.1	38.1	10.3	22.4	25.0	25.9	42.3	43.1	28.2	49.2	49.2	a
SWE	17.7	32.3	35.2	23.5	35.3	35.4	11.3	26.5	31.8	22.0	25.3	28.2	16.7	30.6	32.0	23.5	28.9	29.2	6.8	14.5	23.8	23.1	34.5	34.6	28.2	41.8	42.5	b
CEN	***17.0***	***29.9***	***34.5***	***28.2***	***42.5***	***42.5***	***20.7***	***33.0***	***35.3***	***23.6***	***28.0***	***34.1***	***26.6***	***37.4***	***37.7***	***23.8***	***28.7***	***29.7***	***5.4***	***11.5***	***23.8***	***22.1***	***31.6***	***32.3***	***28.2***	***39.0***	***40.2***	***a+b***
BEL	17.0	29.9	34.5	28.2	42.5	42.5	20.7	33.0	35.3	23.6	28.0	34.1	26.6	37.4	37.7	23.8	28.7	29.7	5.4	11.5	23.8	28.2	42.2	42.5	28.2	39.0	40.2	a+b
CZE	6.2	20.6	31.1	22.5	32.5	32.6	20.7	33.0	35.3	23.6	28.0	34.1	26.6	37.4	37.7	23.8	28.7	29.7	5.4	11.5	23.8	28.2	42.2	42.5	28.2	39.0	40.2	a+b
GBR	18.4	34.3	38.1	28.2	47.2	47.2	22.0	37.2	40.3	26.1	33.7	36.7	28.1	42.0	42.9	23.8	33.5	33.8	7.9	17.1	23.8	24.0	37.1	37.2	23.6	33.7	33.7	a+b
HUN	17.0	29.9	34.5	28.2	42.5	42.5	20.7	33.0	35.3	23.6	28.0	34.1	26.6	37.4	37.7	23.8	28.7	29.7	5.4	11.5	23.8	22.1	31.6	32.3	28.2	39.0	40.2	a+b
IRL	17.0	29.9	34.5	28.2	42.5	42.5	20.7	33.0	35.3	23.6	28.0	34.1	26.6	37.4	37.7	23.8	28.7	29.7	5.4	11.5	23.8	22.1	31.6	32.3	28.2	39.0	40.2	a+b
LTU	-1.2	14.5	29.6	0.9	15.1	28.3	12.7	25.9	32.4	17.7	19.2	28.2	18.1	29.9	32.5	16.3	21.6	24.0	-4.4	5.2	23.8	13.6	24.6	29.9	25.4	31.0	31.4	a+b
LUX	17.0	29.9	34.5	28.2	42.5	42.5	20.7	33.0	35.3	23.6	28.0	34.1	26.6	37.4	37.7	23.8	28.7	29.7	5.4	11.5	23.8	28.2	42.2	42.5	28.2	39.0	40.2	a+b
LVA	17.0	29.9	34.5	22.5	32.5	32.6	10.5	24.0	31.8	15.2	15.9	28.2	15.8	27.9	31.7	23.8	28.7	29.7	13.8	17.0	23.8	22.1	31.6	32.3	28.2	39.0	40.2	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 30 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio χ **= 0.4**, considering the categories of imposed loads A to D2 – **reinforced concrete slab**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***9.9***	***28.3***	***36.3***	***18.8***	***43.3***	***44.7***	***13.5***	***31.3***	***38.4***	***18.8***	***31.5***	***32.1***	***18.8***	***36.9***	***40.7***	***17.5***	***32.7***	***32.9***	***-0.1***	***15.1***	***18.9***	***15.3***	***33.2***	***35.1***	***18.8***	***41.5***	***41.6***	***a+b***
BEL	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	18.8	44.0	44.7	18.8	41.5	41.6	a+b
BGR	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	17.5	37.0	37.1	15.3	33.2	35.1	18.8	41.5	41.6	a
CYP	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	18.8	44.0	44.7	18.8	41.5	41.6	a
CZE	-0.9	19.2	29.7	15.5	33.2	35.9	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	18.8	44.0	44.7	18.8	41.5	41.6	a+b
DNK*	7.7	19.6	21.5	9.5	34.3	34.6	9.6	24.2	25.1	2.3	29.4	42.6	9.8	41.6	41.6	7.2	32.1	34.5	-0.9	8.4	19.7	11.1	47.4	48.6	8.7	43.4	46.4	c
FIN	7.0	19.2	21.8	8.3	22.2	22.3	0.1	12.7	18.8	-1.2	4.4	18.8	5.2	16.9	18.8	6.6	22.0	22.3	4.0	15.1	17.5	7.0	21.3	21.3	7.7	30.0	30.6	c
FRA	-0.9	19.2	29.7	15.5	33.2	35.9	3.3	22.4	31.7	18.8	31.5	32.1	8.6	27.4	33.0	17.5	32.7	32.9	8.5	20.9	22.3	18.8	44.0	44.7	18.8	41.5	41.6	a
GBR	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	15.3	33.2	35.1	14.4	30.0	31.2	a+b
HRV	-11.5	16.7	18.4	-11.5	30.5	30.6	-11.5	20.1	21.4	-11.5	15.1	22.8	-11.5	24.8	25.1	-9.4	19.1	20.0	-9.4	-0.8	-0.8	-11.5	4.6	4.9	-11.5	27.0	28.2	a
HUN	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	15.3	33.2	35.1	18.8	41.5	41.6	a+b
IRL	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	15.3	33.2	35.1	18.8	41.5	41.6	a+b
LTU	-8.2	13.2	26.0	-6.1	15.8	23.5	5.5	24.3	33.0	15.1	22.1	22.6	10.9	29.4	34.5	10.7	25.3	26.5	-10.3	8.5	17.5	6.7	26.2	29.5	18.4	33.2	33.9	a+b
LUX	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	18.8	44.0	44.7	18.8	41.5	41.6	a+b
LVA	9.9	28.3	36.3	15.5	33.2	35.9	3.3	22.4	31.7	9.4	18.6	20.2	8.6	27.4	33.0	17.5	32.7	32.9	8.5	20.9	22.3	15.3	33.2	35.1	18.8	41.5	41.6	a+b
NLD	2.4	16.8	21.4	12.8	25.1	25.7	13.9	27.0	30.1	8.3	22.0	25.7	15.3	29.9	31.2	11.3	24.8	24.9	-4.0	5.9	17.5	12.4	24.5	24.7	11.2	20.8	20.8	b
NOR	7.7	21.6	25.7	18.8	35.9	36.0	11.5	24.8	28.1	15.0	22.0	25.7	17.3	29.9	31.2	17.5	24.8	24.9	-4.0	5.9	17.5	18.8	36.0	36.0	18.8	33.1	33.3	b
PRT	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	8.5	20.9	22.3	15.3	33.2	35.1	18.8	41.5	41.6	a
SVK	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	15.3	33.2	35.1	18.8	41.5	41.6	a
SVN	9.9	28.3	36.3	18.8	43.3	44.7	13.5	31.3	38.4	18.8	31.5	32.1	18.8	36.9	40.7	17.5	32.7	32.9	-0.1	15.1	18.9	15.3	33.2	35.1	18.8	41.5	41.6	a
SWE	7.7	21.6	25.7	12.8	25.1	25.7	0.9	15.3	22.8	11.5	15.2	18.8	6.1	19.7	22.8	14.1	22.0	22.1	-4.0	5.9	17.5	12.4	24.5	24.7	18.8	33.1	33.3	b
CEN	***6.9***	***19.0***	***25.7***	***18.8***	***33.1***	***33.1***	***10.7***	***22.3***	***26.6***	***13.4***	***18.4***	***24.1***	***16.5***	***27.2***	***27.9***	***16.4***	***21.8***	***22.2***	***-5.5***	***2.3***	***17.5***	***11.3***	***21.1***	***23.3***	***18.8***	***29.9***	***30.5***	***a+b***
BEL	6.9	19.0	25.7	18.8	33.1	33.1	10.7	22.3	26.6	13.4	18.4	24.1	16.5	27.2	27.9	16.4	21.8	22.2	-5.5	2.3	17.5	18.8	33.0	33.1	18.8	29.9	30.5	a+b
CZE	-4.3	8.9	22.1	11.8	22.0	23.8	10.7	22.3	26.6	13.4	18.4	24.1	16.5	27.2	27.9	16.4	21.8	22.2	-5.5	2.3	17.5	18.8	33.0	33.1	18.8	29.9	30.5	a+b
GBR	8.4	23.8	28.9	18.8	38.3	38.7	12.1	26.9	31.3	16.4	25.1	27.5	18.0	32.2	34.1	17.5	27.4	27.4	-2.8	8.9	17.5	13.3	27.3	27.9	12.2	23.8	24.0	a+b
HUN	6.9	19.0	25.7	18.8	33.1	33.1	10.7	22.3	26.6	13.4	18.4	24.1	16.5	27.2	27.9	16.4	21.8	22.2	-5.5	2.3	17.5	11.3	21.1	23.3	18.8	29.9	30.5	a+b
IRL	6.9	19.0	25.7	18.8	33.1	33.1	10.7	22.3	26.6	13.4	18.4	24.1	16.5	27.2	27.9	16.4	21.8	22.2	-5.5	2.3	17.5	11.3	21.1	23.3	18.8	29.9	30.5	a+b
LTU	-12.0	2.3	20.4	-11.0	2.7	18.9	2.3	14.6	23.5	6.5	8.1	18.8	7.5	18.9	23.6	6.4	13.7	17.8	-16.3	-4.9	17.5	2.3	13.4	20.7	14.1	20.8	21.3	a+b
LUX	6.9	19.0	25.7	18.8	33.1	33.1	10.7	22.3	26.6	13.4	18.4	24.1	16.5	27.2	27.9	16.4	21.8	22.2	-5.5	2.3	17.5	18.8	33.0	33.1	18.8	29.9	30.5	a+b
LVA	6.9	19.0	25.7	11.8	22.0	23.8	0.1	12.6	22.8	2.9	4.2	18.8	5.1	16.8	22.8	16.4	21.8	22.2	3.6	8.8	17.5	11.3	21.1	23.3	18.8	29.9	30.5	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 31 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio **χ = 0.4**, considering the categories of imposed loads A to D2 – **composite steel concrete slab**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***-8.5***	***7.1***	***12.0***	***-8.5***	***20.5***	***21.1***	***-8.5***	***10.0***	***14.3***	***-8.5***	***4.8***	***5.6***	***-8.5***	***14.6***	***16.7***	***-5.8***	***11.4***	***11.5***	***-21.4***	***-7.9***	***-4.4***	***-8.5***	***9.5***	***10.3***	***-8.5***	***17.4***	***17.4***	***a+b***
BEL	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	20.9	21.1	-8.5	17.4	17.4	a+b
BGR	-2.2	12.5	18.9	-0.8	26.7	27.9	-0.8	15.4	21.2	-0.8	12.8	13.5	-0.8	20.5	23.6	1.1	17.8	18.1	1.1	22.3	22.4	-0.8	16.0	17.4	-0.8	24.3	24.4	a
CYP	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	20.9	21.1	-8.5	17.4	17.4	a
CZE	-16.7	-2.3	4.3	-8.5	9.9	11.2	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	20.9	21.1	-8.5	17.4	17.4	a+b
DNK*	2.3	14.2	17.2	4.3	29.7	29.7	4.5	18.8	20.1	-3.4	26.0	38.3	4.7	36.8	36.9	3.7	29.7	31.0	-5.1	4.9	16.9	6.1	43.5	44.0	3.5	39.8	41.5	c
FIN	-18.1	-2.3	-1.8	-19.7	-1.7	-1.6	-19.5	-9.2	-8.4	-30.2	-24.6	-8.5	-20.0	-6.2	-6.1	-17.5	0.0	0.9	-20.5	-7.9	-5.8	-21.1	-3.0	-2.7	-20.5	5.3	7.0	c
FRA	-16.7	-2.3	4.3	-8.5	9.9	11.2	-12.7	0.8	6.6	-8.5	4.8	5.6	-8.5	4.7	8.0	-5.8	11.4	11.5	-12.6	-1.7	-0.6	-8.5	20.9	21.1	-8.5	17.4	17.4	a
GBR	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	9.5	10.3	-8.5	5.3	5.8	a+b
HRV	-40.7	-4.9	-4.7	-40.7	7.1	7.9	-40.7	-1.6	-1.5	-40.7	-12.9	-3.5	-40.7	2.1	2.2	-34.4	-3.0	-1.3	-34.4	-25.0	-25.0	-40.7	-20.6	-20.5	-40.7	2.0	4.9	a
HUN	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	9.5	10.3	-8.5	17.4	17.4	a+b
IRL	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	9.5	10.3	-8.5	17.4	17.4	a+b
LTU	-24.1	-8.5	0.0	-24.6	-8.3	-3.1	-10.5	2.7	8.1	-11.6	-5.4	-5.0	-8.5	6.8	9.7	-8.5	3.5	4.3	-32.0	-15.0	-5.8	-11.7	2.2	3.9	-8.5	8.6	8.8	a+b
LUX	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	20.9	21.1	-8.5	17.4	17.4	a+b
LVA	-8.5	7.1	12.0	-8.5	9.9	11.2	-12.7	0.8	6.6	-17.7	-9.2	-7.5	-8.5	4.7	8.0	-5.8	11.4	11.5	-12.6	-1.7	-0.6	-8.5	9.5	10.3	-8.5	17.4	17.4	a+b
NLD	-13.4	-4.8	-3.1	-9.3	1.4	1.4	-11.3	5.6	6.6	-20.0	-5.5	-0.5	-12.2	7.3	7.6	-12.5	3.0	3.4	-25.5	-17.8	-5.8	-11.7	0.3	0.4	-14.8	-4.5	-4.4	b
NOR	-4.3	5.6	8.0	-0.8	19.0	19.1	-0.8	8.7	10.8	-5.1	2.5	6.8	-0.8	13.3	13.9	1.1	9.5	9.6	-20.1	-11.1	1.1	-0.8	19.0	19.1	-0.8	15.4	15.8	b
PRT	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-12.6	-1.7	-0.6	-8.5	9.5	10.3	-8.5	17.4	17.4	a
SVK	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	9.5	10.3	-8.5	17.4	17.4	a
SVN	-8.5	7.1	12.0	-8.5	20.5	21.1	-8.5	10.0	14.3	-8.5	4.8	5.6	-8.5	14.6	16.7	-5.8	11.4	11.5	-21.4	-7.9	-4.4	-8.5	9.5	10.3	-8.5	17.4	17.4	a
SWE	-8.5	0.2	1.5	-8.5	1.4	1.4	-15.1	-6.5	-3.8	-16.9	-12.8	-8.5	-11.1	-3.3	-2.7	-5.8	0.1	0.3	-25.5	-17.8	-5.8	-8.5	0.3	0.4	-8.5	8.5	9.4	b
CEN	***-8.8***	***-2.5***	***-0.3***	***-8.5***	***9.8***	***10.1***	***-8.5***	***0.7***	***1.1***	***-14.9***	***-9.4***	***-2.0***	***-8.5***	***4.6***	***4.6***	***-5.8***	***-0.1***	***0.8***	***-27.0***	***-21.6***	***-5.8***	***-8.5***	***-3.2***	***-2.9***	***-8.5***	***5.1***	***6.8***	***a+b***
BEL	-8.8	-2.5	-0.3	-8.5	9.8	10.1	-8.5	0.7	1.1	-14.9	-9.4	-2.0	-8.5	4.6	4.6	-5.8	-0.1	0.8	-27.0	-21.6	-5.8	-8.5	9.3	10.1	-8.5	5.1	6.8	a+b
CZE	-20.2	-12.9	-4.6	-8.5	-1.8	-1.7	-8.5	0.7	1.1	-14.9	-9.4	-2.0	-8.5	4.6	4.6	-5.8	-0.1	0.8	-27.0	-21.6	-5.8	-8.5	9.3	10.1	-8.5	5.1	6.8	a+b
GBR	-8.5	2.4	4.7	-8.5	15.2	15.3	-8.5	5.5	7.4	-11.5	-2.2	1.1	-8.5	9.7	10.3	-5.8	5.8	5.9	-24.2	-14.6	-5.8	-8.5	3.3	3.4	-8.5	-1.3	-1.3	a+b
HUN	-8.8	-2.5	-0.3	-8.5	9.8	10.1	-8.5	0.7	1.1	-14.9	-9.4	-2.0	-8.5	4.6	4.6	-5.8	-0.1	0.8	-27.0	-21.6	-5.8	-8.5	-3.2	-2.9	-8.5	5.1	6.8	a+b
IRL	-8.8	-2.5	-0.3	-8.5	9.8	10.1	-8.5	0.7	1.1	-14.9	-9.4	-2.0	-8.5	4.6	4.6	-5.8	-0.1	0.8	-27.0	-21.6	-5.8	-8.5	-3.2	-2.9	-8.5	5.1	6.8	a+b
LTU	-28.0	-19.8	-6.7	-29.6	-22.1	-8.4	-13.7	-7.2	-2.9	-22.4	-20.5	-8.5	-9.6	-4.0	-3.0	-12.8	-8.8	-5.5	-38.3	-29.4	-5.8	-16.3	-11.3	-6.4	-8.5	-4.5	-3.5	a+b
LUX	-8.8	-2.5	-0.3	-8.5	9.8	10.1	-8.5	0.7	1.1	-14.9	-9.4	-2.0	-8.5	4.6	4.6	-5.8	-0.1	0.8	-27.0	-21.6	-5.8	-8.5	9.3	10.1	-8.5	5.1	6.8	a+b
LVA	-8.8	-2.5	-0.3	-8.5	-1.8	-1.7	-16.0	-9.3	-3.8	-25.6	-24.8	-8.5	-12.0	-6.3	-3.9	-5.8	-0.1	0.8	-17.6	-14.7	-5.8	-8.5	-3.2	-2.9	-8.5	5.1	6.8	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 32 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio **χ = 0.4**, considering the categories of imposed loads A to D2 – **steel tie**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	
CEN	***-9.1***	***8.7***	***27.7***	***4.9***	***29.1***	***39.0***	***-5.4***	***12.1***	***30.4***	***4.9***	***27.5***	***27.5***	***0.2***	***19.6***	***33.7***	***2.4***	***28.5***	***34.8***	***-20.4***	***6.5***	***16.8***	***-5.2***	***17.4***	***26.8***	***4.9***	***30.6***	***35.8***	***a+b***
BEL	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	4.9	31.1	39.0	4.9	30.6	35.8	a+b
BGR	-5.2	14.7	38.5	12.0	36.5	49.6	-1.5	18.2	41.1	16.5	39.5	39.6	4.4	26.4	44.3	7.3	36.8	45.0	19.7	48.0	51.5	-0.6	25.3	37.7	13.1	39.4	46.7	a
CYP	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	4.9	31.1	39.0	4.9	30.6	35.8	a
CZE	-20.6	-2.0	19.4	-4.9	16.5	27.8	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	4.9	31.1	39.0	4.9	30.6	35.8	a+b
DNK*	0.7	14.8	38.5	19.7	37.9	42.0	6.4	20.3	38.5	9.8	54.8	59.6	19.9	43.3	50.1	24.5	50.2	51.6	3.3	21.5	43.4	22.3	56.2	59.0	18.9	56.2	57.2	c
FIN	-12.2	-2.0	4.9	-11.3	2.7	4.9	-19.8	-9.6	4.9	-25.6	-16.2	4.9	-15.3	-4.5	4.9	-3.9	13.6	14.4	-7.9	6.5	12.8	-13.3	2.1	4.9	-12.1	15.3	15.6	c
FRA	-20.6	-2.0	19.4	-4.9	16.5	27.8	-16.4	1.8	22.0	4.9	27.5	27.5	-11.6	8.2	23.9	2.4	28.5	34.8	-10.4	15.1	21.9	4.9	31.1	39.0	4.9	30.6	35.8	a
GBR	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	-5.2	17.4	26.8	-7.4	15.3	22.6	a+b
HRV	-42.1	-4.8	-1.5	-42.1	13.2	14.0	-42.1	-0.9	2.4	-42.1	1.1	6.5	-42.1	5.1	7.0	-29.8	9.6	9.8	-29.8	-17.1	-16.4	-42.1	-19.5	-18.6	-42.1	11.2	11.2	a
HUN	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	-5.2	17.4	26.8	4.9	30.6	35.8	a+b
IRL	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	-5.2	17.4	26.8	4.9	30.6	35.8	a+b
LTU	-28.5	-8.9	14.7	-28.7	-5.3	12.0	-14.0	3.9	23.6	-4.8	12.4	13.8	-9.1	10.5	25.8	-8.1	18.2	26.6	-32.6	-3.2	13.3	-14.7	8.4	19.7	-3.0	19.6	26.1	a+b
LUX	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	4.9	31.1	39.0	4.9	30.6	35.8	a+b
LVA	-9.1	8.7	27.7	-4.9	16.5	27.8	-16.4	1.8	22.0	-12.4	6.6	9.8	-11.6	8.2	23.9	2.4	28.5	34.8	-10.4	15.1	21.9	-5.2	17.4	26.8	4.9	30.6	35.8	a+b
NLD	-17.1	-4.8	5.1	-7.8	6.4	10.3	-5.0	7.1	15.6	-10.5	12.2	13.8	-2.2	11.2	17.1	-0.6	17.5	19.4	-25.1	-7.2	12.8	-8.4	6.2	9.1	-11.1	2.9	4.9	b
NOR	-7.5	7.0	25.6	9.5	27.4	33.1	-3.7	10.7	26.9	13.5	24.1	25.1	2.0	18.0	27.8	4.3	25.9	29.0	-18.9	2.2	23.3	10.2	28.9	33.1	10.1	28.2	30.4	b
PRT	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-10.4	15.1	21.9	-5.2	17.4	26.8	4.9	30.6	35.8	a
SVK	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	-5.2	17.4	26.8	4.9	30.6	35.8	a
SVN	-9.1	8.7	27.7	4.9	29.1	39.0	-5.4	12.1	30.4	4.9	27.5	27.5	0.2	19.6	33.7	2.4	28.5	34.8	-20.4	6.5	16.8	-5.2	17.4	26.8	4.9	30.6	35.8	a
SWE	-11.4	0.8	14.4	-7.8	6.4	12.3	-18.9	-6.6	10.7	-4.4	1.3	4.9	-14.4	-1.1	10.9	-4.3	13.7	16.3	-25.1	-7.2	12.8	-8.4	6.2	11.8	4.9	19.4	20.4	b
CEN	***-12.2***	***-2.1***	***14.4***	***4.2***	***16.4***	***19.1***	***-8.4***	***1.7***	***15.6***	***-1.3***	***6.3***	***9.7***	***-3.1***	***8.0***	***16.5***	***-1.8***	***13.4***	***17.7***	***-26.8***	***-12.4***	***12.8***	***-9.6***	***1.9***	***11.8***	***3.8***	***15.1***	***15.4***	***a+b***
BEL	-12.2	-2.1	14.4	4.2	16.4	19.1	-8.4	1.7	15.6	-1.3	6.3	9.7	-3.1	8.0	16.5	-1.8	13.4	17.7	-26.8	-12.4	12.8	4.6	17.2	19.1	3.8	15.1	15.4	a+b
CZE	-24.3	-14.0	9.7	-8.8	2.5	12.3	-8.4	1.7	15.6	-1.3	6.3	9.7	-3.1	8.0	16.5	-1.8	13.4	17.7	-26.8	-12.4	12.8	4.6	17.2	19.1	3.8	15.1	15.4	a+b
GBR	-10.6	3.4	15.2	4.9	22.9	28.2	-6.9	7.0	18.4	3.0	17.1	17.8	-1.4	14.0	22.2	0.3	21.1	24.2	-23.6	-2.7	12.8	-7.4	9.8	14.5	-9.9	7.0	10.1	a+b
HUN	-12.2	-2.1	14.4	4.2	16.4	19.1	-8.4	1.7	15.6	-1.3	6.3	9.7	-3.1	8.0	16.5	-1.8	13.4	17.7	-26.8	-12.4	12.8	-9.6	1.9	11.8	3.8	15.1	15.4	a+b
IRL	-12.2	-2.1	14.4	4.2	16.4	19.1	-8.4	1.7	15.6	-1.3	6.3	9.7	-3.1	8.0	16.5	-1.8	13.4	17.7	-26.8	-12.4	12.8	-9.6	1.9	11.8	3.8	15.1	15.4	a+b
LTU	-32.6	-21.8	7.4	-34.1	-22.0	5.4	-17.4	-7.4	11.6	-13.1	-10.2	4.9	-12.8	-2.0	11.9	-12.8	2.0	14.2	-40.1	-23.2	12.8	-19.6	-8.1	8.2	-7.8	2.9	9.4	a+b
LUX	-12.2	-2.1	14.4	4.2	16.4	19.1	-8.4	1.7	15.6	-1.3	6.3	9.7	-3.1	8.0	16.5	-1.8	13.4	17.7	-26.8	-12.4	12.8	4.6	17.2	19.1	3.8	15.1	15.4	a+b
LVA	-12.2	-2.1	14.4	-8.8	2.5	12.3	-19.8	-9.8	10.7	-21.3	-16.5	4.9	-15.4	-4.7	10.9	-1.8	13.4	17.7	-16.0	-2.8	12.8	-9.6	1.9	11.8	3.8	15.1	15.4	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 33 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio **χ = 0.4**, considering the categories of imposed loads A to D2 – **steel column**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	β_{min}	$\beta_{\mid\chi=0.4}$	β_{max}	
CEN	***-0.9***	***14.7***	***22.3***	***2.9***	***29.7***	***31.3***	***2.6***	***17.7***	***24.6***	***2.9***	***16.9***	***17.4***	***2.9***	***23.1***	***27.0***	***4.6***	***21.1***	***21.6***	***-13.9***	***2.1***	***6.2***	***2.9***	***19.0***	***20.9***	***2.9***	***27.7***	***27.9***	***a+b***
BEL	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	30.4	31.3	2.9	27.7	27.9	a+b
BGR	2.8	20.1	29.6	10.8	36.0	38.5	6.3	23.1	31.8	10.8	25.1	25.5	10.8	29.0	34.2	11.6	27.6	28.3	11.6	32.7	32.7	7.2	25.6	28.3	10.8	34.7	35.2	a
CYP	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	30.4	31.3	2.9	27.7	27.9	a
CZE	-11.7	5.3	15.1	2.9	19.1	21.8	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	30.4	31.3	2.9	27.7	27.9	a+b
DNK*	10.4	22.9	30.5	17.5	40.3	40.4	15.8	27.7	30.8	9.9	40.0	50.3	17.8	46.6	47.5	15.5	40.7	41.2	6.6	16.2	28.9	19.2	54.5	54.5	16.7	51.7	52.3	c
FIN	-6.9	5.3	7.2	-8.5	7.5	7.5	-10.9	-1.5	2.9	-19.0	-13.0	2.9	-8.8	2.3	3.1	-7.3	9.6	9.9	-10.2	2.1	4.6	-9.9	6.4	6.4	-9.2	15.5	16.1	c
FRA	-11.7	5.3	15.1	2.9	19.1	21.8	-7.7	8.6	17.3	2.9	16.9	17.4	-3.0	13.2	18.7	4.6	21.1	21.6	-5.1	8.4	10.0	2.9	30.4	31.3	2.9	27.7	27.9	a
GBR	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	19.0	20.9	0.8	15.5	16.7	a+b
HRV	-30.0	2.8	3.7	-30.0	16.3	16.4	-30.0	6.1	6.9	-30.0	-1.2	7.0	-30.0	10.6	10.7	-24.7	6.5	7.3	-24.7	-15.2	-15.2	-30.0	-11.2	-11.2	-30.0	12.2	13.6	a
HUN	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	19.0	20.9	2.9	27.7	27.9	a+b
IRL	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	19.0	20.9	2.9	27.7	27.9	a+b
LTU	-19.2	-0.8	11.0	-18.7	0.8	8.2	-5.5	10.5	18.7	-1.1	6.5	7.0	-0.7	15.3	20.3	-2.0	13.1	14.6	-24.3	-5.1	4.6	-5.7	11.6	14.8	2.9	18.8	19.7	a+b
LUX	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	30.4	31.3	2.9	27.7	27.9	a+b
LVA	-0.9	14.7	22.3	2.9	19.1	21.8	-7.7	8.6	17.3	-7.2	2.6	4.4	-3.0	13.2	18.7	4.6	21.1	21.6	-5.1	8.4	10.0	2.9	19.0	20.9	2.9	27.7	27.9	a+b
NLD	-8.4	2.9	6.5	0.6	10.6	11.0	0.0	13.3	15.9	-8.6	6.4	10.3	-0.9	15.8	16.9	-2.2	12.6	12.7	-17.9	-7.9	4.6	-0.4	9.8	10.0	-3.4	5.6	5.6	b
NOR	0.6	13.2	18.3	10.8	28.2	28.7	4.3	16.4	20.5	6.9	14.6	17.9	9.7	21.8	23.6	9.2	19.1	19.1	-12.5	-1.1	11.6	10.8	28.6	28.7	10.8	25.7	25.8	b
PRT	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-5.1	8.4	10.0	2.9	19.0	20.9	2.9	27.7	27.9	a
SVK	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	19.0	20.9	2.9	27.7	27.9	a
SVN	-0.9	14.7	22.3	2.9	29.7	31.3	2.6	17.7	24.6	2.9	16.9	17.4	2.9	23.1	27.0	4.6	21.1	21.6	-13.9	2.1	6.2	2.9	19.0	20.9	2.9	27.7	27.9	a
SWE	-3.0	7.8	10.9	0.6	10.6	11.0	-10.1	1.2	7.4	-5.2	-1.0	2.9	-5.6	5.2	7.3	1.3	9.7	9.7	-17.9	-7.9	4.6	0.0	9.8	10.0	2.9	18.7	18.9	b
CEN	***-3.8***	***5.2***	***10.7***	***2.9***	***18.9***	***18.9***	***-0.2***	***8.4***	***11.7***	***-3.1***	***2.4***	***8.4***	***2.9***	***13.1***	***13.5***	***3.7***	***9.4***	***9.7***	***-19.4***	***-11.8***	***4.6***	***-1.1***	***6.3***	***8.0***	***2.9***	***15.3***	***16.0***	***a+b***
BEL	-3.8	5.2	10.7	2.9	18.9	18.9	-0.2	8.4	11.7	-3.1	2.4	8.4	2.9	13.1	13.5	3.7	9.4	9.7	-19.4	-11.8	4.6	2.9	18.9	19.0	2.9	15.3	16.0	a+b
CZE	-15.2	-5.3	6.6	-0.4	7.3	8.4	-0.2	8.4	11.7	-3.1	2.4	8.4	2.9	13.1	13.5	3.7	9.4	9.7	-19.4	-11.8	4.6	2.9	18.9	19.0	2.9	15.3	16.0	a+b
GBR	-2.3	10.1	14.5	2.9	24.4	24.9	1.2	13.2	17.1	0.2	9.8	12.3	2.9	18.2	20.0	4.6	15.4	15.4	-16.6	-4.7	4.6	1.0	12.8	13.4	-1.4	8.8	9.0	a+b
HUN	-3.8	5.2	10.7	2.9	18.9	18.9	-0.2	8.4	11.7	-3.1	2.4	8.4	2.9	13.1	13.5	3.7	9.4	9.7	-19.4	-11.8	4.6	-1.1	6.3	8.0	2.9	15.3	16.0	a+b
IRL	-3.8	5.2	10.7	2.9	18.9	18.9	-0.2	8.4	11.7	-3.1	2.4	8.4	2.9	13.1	13.5	3.7	9.4	9.7	-19.4	-11.8	4.6	-1.1	6.3	8.0	2.9	15.3	16.0	a+b
LTU	-23.0	-12.1	4.7	-23.6	-13.0	3.0	-8.7	0.5	8.2	-10.7	-8.9	2.9	-4.1	4.4	8.2	-6.3	0.7	4.9	-30.6	-19.7	4.6	-10.3	-1.9	5.0	0.5	5.6	5.8	a+b
LUX	-3.8	5.2	10.7	2.9	18.9	18.9	-0.2	8.4	11.7	-3.1	2.4	8.4	2.9	13.1	13.5	3.7	9.4	9.7	-19.4	-11.8	4.6	2.9	18.9	19.0	2.9	15.3	16.0	a+b
LVA	-3.8	5.2	10.7	-0.4	7.3	8.4	-11.0	-1.6	7.4	-14.1	-13.2	2.9	-6.6	2.2	7.3	3.7	9.4	9.7	-10.0	-4.8	4.6	-1.1	6.3	8.0	2.9	15.3	16.0	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 34 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio **χ = 0.4**, considering the categories of imposed loads A to D2 – **timber beam**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***-4.0***	***12.9***	***13.1***	***-4.0***	***19.3***	***20.2***	***-4.0***	***14.9***	***15.0***	***-4.0***	***3.1***	***4.7***	***-4.0***	***16.7***	***16.8***	***-6.9***	***5.3***	***6.4***	***-13.9***	***-8.2***	***-6.6***	***-4.0***	***10.9***	***11.3***	***-4.0***	***14.7***	***16.7***	***a+b***
BEL	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	18.8	20.2	-4.0	14.7	16.7	a+b
BGR	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-6.9	6.6	9.3	-4.0	10.9	11.3	-4.0	14.7	16.7	a
CYP	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	18.8	20.2	-4.0	14.7	16.7	a
CZE	-4.0	5.8	6.6	-4.0	11.8	12.0	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	18.8	20.2	-4.0	14.7	16.7	a+b
DNK*	-7.4	9.0	9.9	-6.5	15.8	21.6	-6.2	12.2	13.6	-11.8	5.3	16.9	-6.2	23.2	27.9	-11.1	7.6	16.1	-16.6	-9.8	-2.5	-5.5	24.4	33.5	-7.2	19.4	30.3	c
FIN	-9.9	5.8	6.1	-11.0	3.7	5.9	-10.7	0.4	0.5	-17.8	-14.7	-4.0	-11.1	1.6	2.3	-14.4	-2.1	2.2	-16.3	-8.2	-4.8	-11.9	2.3	5.0	-11.6	6.7	12.6	c
FRA	-4.0	5.8	6.6	-4.0	11.8	12.0	-4.0	8.0	8.5	-4.0	3.1	4.7	-4.0	9.4	9.5	-6.9	5.3	6.4	-7.4	-4.2	-4.2	-4.0	18.8	20.2	-4.0	14.7	16.7	a
GBR	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	10.9	11.3	-4.0	6.7	7.0	a+b
HRV	-24.0	3.9	4.6	-24.0	9.9	14.7	-24.0	6.2	7.2	-24.0	-7.7	-0.1	-24.0	7.5	10.1	-24.6	-4.0	1.4	-24.6	-18.9	-18.4	-24.0	-9.7	-8.6	-24.0	4.5	11.8	a
HUN	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	10.9	11.3	-4.0	14.7	16.7	a+b
IRL	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	10.9	11.3	-4.0	14.7	16.7	a+b
LTU	-9.4	1.1	2.9	-9.9	-0.9	0.0	-4.0	9.4	9.8	-5.4	-3.1	-2.9	-4.0	10.9	10.9	-6.9	0.2	0.3	-21.5	-12.6	-6.9	-4.0	5.9	5.9	-4.0	8.9	9.5	a+b
LUX	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	18.8	20.2	-4.0	14.7	16.7	a+b
LVA	-4.0	12.9	13.1	-4.0	11.8	12.0	-4.0	8.0	8.5	-9.4	-5.4	-3.9	-4.0	9.4	9.5	-6.9	5.3	6.4	-7.4	-4.2	-4.2	-4.0	10.9	11.3	-4.0	14.7	16.7	a+b
NLD	-5.1	3.9	3.9	-4.5	5.9	7.3	-5.7	11.6	11.9	-11.5	-3.2	1.8	-6.4	11.4	12.5	-11.4	-0.1	3.0	-16.8	-14.4	-6.9	-6.1	4.6	6.4	-8.1	0.2	2.1	b
NOR	-7.8	4.4	4.6	-7.8	10.2	13.5	-7.8	6.5	6.9	-11.6	-7.1	-2.0	-7.8	7.9	9.4	-10.3	-3.4	0.1	-20.0	-17.8	-10.3	-7.8	9.4	13.5	-7.8	5.1	10.3	b
PRT	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-7.4	-4.2	-4.2	-4.0	10.9	11.3	-4.0	14.7	16.7	a
SVK	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	10.9	11.3	-4.0	14.7	16.7	a
SVN	-4.0	12.9	13.1	-4.0	19.3	20.2	-4.0	14.9	15.0	-4.0	3.1	4.7	-4.0	16.7	16.8	-6.9	5.3	6.4	-13.9	-8.2	-6.6	-4.0	10.9	11.3	-4.0	14.7	16.7	a
SWE	-4.0	7.7	7.7	-4.0	5.9	7.3	-4.0	2.4	2.4	-10.0	-7.6	-4.0	-4.0	3.7	4.0	-6.9	-2.0	0.5	-16.8	-14.4	-6.9	-4.0	4.6	6.4	-4.0	8.8	13.4	b
CEN	***-4.0***	***5.7***	***6.0***	***-4.0***	***11.7***	***15.5***	***-4.0***	***7.9***	***8.5***	***-8.9***	***-5.5***	***0.8***	***-4.0***	***9.3***	***11.1***	***-6.9***	***-2.2***	***2.1***	***-17.9***	***-16.7***	***-6.9***	***-4.0***	***2.2***	***4.9***	***-4.0***	***6.5***	***12.6***	***a+b***
BEL	-4.0	5.7	6.0	-4.0	11.7	15.5	-4.0	7.9	8.5	-8.9	-5.5	0.8	-4.0	9.3	11.1	-6.9	-2.2	2.1	-17.9	-16.7	-6.9	-4.0	10.8	15.5	-4.0	6.5	12.6	a+b
CZE	-6.0	-2.2	-1.0	-4.0	3.6	5.8	-4.0	7.9	8.5	-8.9	-5.5	0.8	-4.0	9.3	11.1	-6.9	-2.2	2.1	-17.9	-16.7	-6.9	-4.0	10.8	15.5	-4.0	6.5	12.6	a+b
GBR	-4.0	9.4	9.4	-4.0	15.6	17.7	-4.0	11.5	11.5	-6.5	-1.1	2.7	-4.0	13.1	13.8	-6.9	1.7	4.0	-15.9	-12.3	-6.9	-4.0	6.7	7.9	-4.0	2.3	3.5	a+b
HUN	-4.0	5.7	6.0	-4.0	11.7	15.5	-4.0	7.9	8.5	-8.9	-5.5	0.8	-4.0	9.3	11.1	-6.9	-2.2	2.1	-17.9	-16.7	-6.9	-4.0	2.2	4.9	-4.0	6.5	12.6	a+b
IRL	-4.0	5.7	6.0	-4.0	11.7	15.5	-4.0	7.9	8.5	-8.9	-5.5	0.8	-4.0	9.3	11.1	-6.9	-2.2	2.1	-17.9	-16.7	-6.9	-4.0	2.2	4.9	-4.0	6.5	12.6	a+b
LTU	-12.7	-7.3	-2.7	-14.0	-10.5	-4.0	-4.0	1.9	2.1	-13.4	-12.3	-4.0	-4.0	3.1	4.1	-9.4	-7.8	-5.6	-25.9	-21.6	-6.9	-4.1	-3.4	-2.0	-4.0	0.1	4.0	a+b
LUX	-4.0	5.7	6.0	-4.0	11.7	15.5	-4.0	7.9	8.5	-8.9	-5.5	0.8	-4.0	9.3	11.1	-6.9	-2.2	2.1	-17.9	-16.7	-6.9	-4.0	10.8	15.5	-4.0	6.5	12.6	a+b
LVA	-4.0	5.7	6.0	-4.0	3.6	5.8	-4.0	0.3	0.4	-15.3	-14.8	-4.0	-4.0	1.4	2.2	-6.9	-2.2	2.1	-13.3	-12.4	-6.9	-4.0	2.2	4.9	-4.0	6.5	12.6	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 35 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio χ **= 0.4**, considering the categories of imposed loads A to D2 – **timber column**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	β_{min}	$\beta_{\|\chi=0.4}$	β_{max}	
CEN	***-6.0***	***9.8***	***10.3***	***-6.0***	***13.1***	***16.9***	***-6.0***	***11.3***	***12.0***	***-6.0***	***-1.2***	***0.5***	***-6.0***	***11.7***	***13.6***	***-10.8***	***-1.3***	***1.3***	***-15.0***	***-11.8***	***-10.8***	***-6.0***	***6.4***	***8.3***	***-6.0***	***8.7***	***13.2***	***a+b***
BEL	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	12.4	16.9	-6.0	8.7	13.2	a+b
BGR	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-10.8	-0.7	3.1	-6.0	6.4	8.3	-6.0	8.7	13.2	a
CYP	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	12.4	16.9	-6.0	8.7	13.2	a
CZE	-6.0	4.1	4.1	-6.0	7.3	9.0	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	12.4	16.9	-6.0	8.7	13.2	a+b
DNK*	-5.2	9.6	12.9	-4.6	13.5	22.5	-4.3	12.1	16.4	-8.7	3.8	13.0	-4.4	19.8	28.6	-11.4	2.9	12.3	-15.6	-10.5	-4.9	-3.8	19.9	32.3	-5.2	15.5	27.9	c
FIN	-10.4	4.1	6.5	-11.3	1.0	6.0	-11.1	-0.3	1.2	-16.5	-14.4	-6.0	-11.4	-0.1	2.8	-16.5	-6.9	-1.1	-18.0	-11.8	-7.9	-12.0	-0.2	5.1	-11.8	2.5	10.6	c
FRA	-6.0	4.1	4.1	-6.0	7.3	9.0	-6.0	5.7	5.8	-6.0	-1.2	0.5	-6.0	6.1	6.6	-10.8	-1.3	1.3	-10.8	-8.9	-8.9	-6.0	12.4	16.9	-6.0	8.7	13.2	a
GBR	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	6.4	8.3	-6.0	2.5	3.9	a+b
HRV	-21.0	2.6	5.8	-21.0	5.8	14.0	-21.0	4.3	8.2	-21.0	-9.2	-3.1	-21.0	4.6	10.6	-24.0	-8.4	-1.7	-24.0	-19.8	-18.9	-21.0	-9.5	-6.8	-21.0	0.9	9.9	a
HUN	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	6.4	8.3	-6.0	8.7	13.2	a+b
IRL	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	6.4	8.3	-6.0	8.7	13.2	a+b
LTU	-6.0	0.4	0.5	-6.8	-2.6	-2.5	-6.0	6.9	7.1	-7.2	-5.8	-5.6	-6.0	7.2	8.1	-10.8	-5.2	-4.5	-20.9	-15.1	-10.8	-6.0	2.5	3.1	-6.0	4.2	6.4	a+b
LUX	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	12.4	16.9	-6.0	8.7	13.2	a+b
LVA	-6.0	9.8	10.3	-6.0	7.3	9.0	-6.0	5.7	5.8	-10.1	-7.5	-6.0	-6.0	6.1	6.6	-10.8	-1.3	1.3	-10.8	-8.9	-8.9	-6.0	6.4	8.3	-6.0	8.7	13.2	a+b
NLD	-6.8	2.6	3.7	-6.4	2.7	6.7	-7.3	8.6	11.2	-11.8	-5.9	-1.7	-7.9	7.6	11.7	-14.2	-5.4	-0.5	-17.3	-16.5	-10.8	-7.6	1.5	5.9	-9.2	-2.4	1.5	b
NOR	-8.9	2.9	5.0	-8.9	6.1	12.8	-8.9	4.5	7.1	-12.0	-8.8	-4.5	-8.9	4.8	9.3	-13.3	-7.9	-2.8	-19.8	-19.0	-13.3	-8.9	5.2	12.7	-8.9	1.3	8.7	b
PRT	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-10.8	-8.9	-8.9	-6.0	6.4	8.3	-6.0	8.7	13.2	a
SVK	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	6.4	8.3	-6.0	8.7	13.2	a
SVN	-6.0	9.8	10.3	-6.0	13.1	16.9	-6.0	11.3	12.0	-6.0	-1.2	0.5	-6.0	11.7	13.6	-10.8	-1.3	1.3	-15.0	-11.8	-10.8	-6.0	6.4	8.3	-6.0	8.7	13.2	a
SWE	-6.0	5.6	7.3	-6.0	2.7	6.7	-6.0	1.3	2.2	-10.9	-9.2	-6.0	-6.0	1.5	3.6	-10.8	-6.9	-2.7	-17.3	-16.5	-10.8	-6.0	1.5	5.9	-6.0	4.2	11.3	b
CEN	***-6.0***	***4.0***	***6.4***	***-6.0***	***7.2***	***14.6***	***-6.0***	***5.7***	***8.7***	***-10.1***	***-7.6***	***-2.4***	***-6.0***	***6.0***	***11.1***	***-10.8***	***-7.0***	***-1.1***	***-18.4***	***-18.2***	***-10.8***	***-6.0***	***-0.3***	***5.1***	***-6.0***	***2.5***	***10.6***	***a+b***
BEL	-6.0	4.0	6.4	-6.0	7.2	14.6	-6.0	5.7	8.7	-10.1	-7.6	-2.4	-6.0	6.0	11.1	-10.8	-7.0	-1.1	-18.4	-18.2	-10.8	-6.0	6.3	14.4	-6.0	2.5	10.6	a+b
CZE	-6.0	-2.3	-1.3	-6.0	0.9	6.0	-6.0	5.7	8.7	-10.1	-7.6	-2.4	-6.0	6.0	11.1	-10.8	-7.0	-1.1	-18.4	-18.2	-10.8	-6.0	6.3	14.4	-6.0	2.5	10.6	a+b
GBR	-6.0	7.0	8.2	-6.0	10.2	15.7	-6.0	8.5	10.2	-8.2	-4.4	-1.0	-6.0	8.9	12.2	-10.8	-4.1	0.1	-16.6	-14.9	-10.8	-6.0	3.1	6.5	-6.0	-0.8	2.2	a+b
HUN	-6.0	4.0	6.4	-6.0	7.2	14.6	-6.0	5.7	8.7	-10.1	-7.6	-2.4	-6.0	6.0	11.1	-10.8	-7.0	-1.1	-18.4	-18.2	-10.8	-6.0	-0.3	5.1	-6.0	2.5	10.6	a+b
IRL	-6.0	4.0	6.4	-6.0	7.2	14.6	-6.0	5.7	8.7	-10.1	-7.6	-2.4	-6.0	6.0	11.1	-10.8	-7.0	-1.1	-18.4	-18.2	-10.8	-6.0	-0.3	5.1	-6.0	2.5	10.6	a+b
LTU	-7.9	-6.4	-4.9	-10.2	-10.0	-6.0	-6.0	0.9	2.7	-13.5	-12.6	-6.0	-6.0	1.1	4.5	-12.6	-11.2	-7.6	-24.4	-21.9	-10.8	-6.0	-4.6	-1.3	-6.0	-2.4	3.5	a+b
LUX	-6.0	4.0	6.4	-6.0	7.2	14.6	-6.0	5.7	8.7	-10.1	-7.6	-2.4	-6.0	6.0	11.1	-10.8	-7.0	-1.1	-18.4	-18.2	-10.8	-6.0	6.3	14.4	-6.0	2.5	10.6	a+b
LVA	-6.0	4.0	6.4	-6.0	0.9	6.0	-6.0	-0.4	1.1	-14.9	-14.5	-6.0	-6.0	-0.2	2.8	-10.8	-7.0	-1.1	-15.7	-15.0	-10.8	-6.0	-0.3	5.1	-6.0	2.5	10.6	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Table 36 - Reliability levels (**%**) relative to CEN target values, β minimum and maximum for relevant χ load ratios, and β for the load ratio **χ = 0.4**, considering the categories of imposed loads A to D2 – **masonry wall**

MS\Cat	A			B			C1			C2			C3			C4			C5			D1			D2			Load comb.
	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	β_{min}	$\beta_{\vert\chi=0.4}$	β_{max}	
CEN	***32.3***	***45.0***	***45.8***	***32.3***	***51.4***	***51.7***	***32.3***	***46.8***	***47.3***	***32.3***	***38.5***	***39.6***	***32.3***	***48.8***	***48.8***	***23.9***	***34.1***	***34.7***	***17.2***	***22.9***	***24.2***	***32.3***	***44.3***	***44.4***	***32.3***	***47.8***	***48.9***	***a+b***
BEL	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	51.1	51.7	32.3	47.8	48.9	a+b
BGR	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	23.9	35.3	37.3	32.3	44.3	44.4	32.3	47.8	48.9	a
CYP	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	51.1	51.7	32.3	47.8	48.9	a
CZE	34.2	48.2	50.7	42.9	55.0	55.0	42.9	56.3	57.2	42.9	49.2	50.2	42.9	58.6	58.7	33.2	42.1	44.2	25.9	32.2	33.6	42.9	60.6	61.4	42.9	58.1	58.8	a+b
DNK*	9.2	23.4	24.2	10.0	29.1	34.8	10.3	26.3	27.6	5.6	19.8	29.8	10.2	35.6	40.5	2.0	17.9	26.1	-2.6	3.1	9.2	10.8	36.5	45.6	9.4	32.0	42.5	c
FIN	27.4	38.8	38.8	26.4	38.0	38.8	26.6	34.2	34.3	20.9	23.6	32.3	26.3	35.8	35.8	17.6	27.8	30.6	16.1	22.9	25.0	25.7	37.0	38.0	26.0	41.0	44.4	c
FRA	40.9	56.5	59.8	52.2	63.6	63.6	44.4	58.6	61.0	52.2	58.7	61.4	48.9	60.8	61.3	41.5	51.6	53.0	39.2	42.0	43.7	52.2	70.1	73.0	52.2	67.0	72.3	a
GBR	53.5	67.7	69.5	57.9	76.2	76.2	56.5	69.6	71.2	57.9	61.9	68.0	57.9	72.6	73.1	44.5	58.1	66.9	38.4	43.7	44.9	57.9	68.7	68.7	57.9	65.5	65.9	a+b
HRV	26.0	46.5	46.6	26.0	53.3	54.9	26.0	48.7	48.7	26.0	40.2	46.0	26.0	50.7	51.1	18.3	35.4	38.2	18.3	23.2	23.3	26.0	36.8	36.8	26.0	49.4	52.8	a
HUN	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	44.3	44.4	32.3	47.8	48.9	a+b
IRL	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	44.3	44.4	32.3	47.8	48.9	a+b
LTU	39.2	57.5	61.9	42.6	58.3	60.7	50.2	64.8	66.9	56.4	59.3	59.4	55.0	67.5	68.2	44.5	52.4	53.2	31.9	41.8	44.5	52.3	64.1	64.1	57.9	67.6	68.2	a+b
LUX	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	51.1	51.7	32.3	47.8	48.9	a+b
LVA	47.3	60.1	61.2	49.2	60.7	61.0	42.2	55.9	58.3	44.5	48.5	49.5	46.6	58.2	59.1	38.8	48.3	50.1	36.7	41.1	41.3	49.2	60.5	60.5	49.2	63.6	65.1	a+b
NLD	10.2	18.1	18.1	10.7	19.7	21.1	9.6	24.8	25.2	4.8	11.7	16.1	9.1	24.5	25.8	1.3	10.9	14.2	-3.1	-1.2	5.1	9.3	18.6	20.3	7.6	14.7	16.6	b
NOR	32.3	40.4	40.5	32.3	46.7	48.0	32.3	42.4	42.4	29.5	33.3	37.2	32.3	44.3	44.5	23.9	29.5	31.5	14.7	17.6	23.9	32.3	46.1	48.0	32.3	42.8	45.5	b
PRT	42.7	54.4	55.7	42.9	61.0	61.4	42.9	56.3	57.2	42.9	49.2	50.2	42.9	58.6	58.7	33.2	42.1	44.2	31.5	35.5	35.6	42.9	54.4	54.4	42.9	58.1	58.8	a
SVK	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	44.3	44.4	32.3	47.8	48.9	a
SVN	32.3	45.0	45.8	32.3	51.4	51.7	32.3	46.8	47.3	32.3	38.5	39.6	32.3	48.8	48.8	23.9	34.1	34.7	17.2	22.9	24.2	32.3	44.3	44.4	32.3	47.8	48.9	a
SWE	51.8	63.1	63.9	56.7	63.9	64.0	46.6	58.9	60.4	53.4	55.5	57.9	51.3	61.1	61.2	44.5	50.0	51.9	35.9	40.3	44.5	56.5	62.9	63.3	57.9	67.6	69.4	b
CEN	***32.3***	***38.7***	***38.7***	***32.3***	***44.9***	***46.7***	***32.3***	***40.7***	***40.7***	***28.5***	***31.3***	***36.3***	***32.3***	***42.5***	***43.0***	***23.9***	***27.8***	***30.5***	***13.7***	***15.6***	***23.9***	***32.3***	***36.9***	***37.9***	***32.3***	***40.9***	***44.4***	***a+b***
BEL	32.3	38.7	38.7	32.3	44.9	46.7	32.3	40.7	40.7	28.5	31.3	36.3	32.3	42.5	43.0	23.9	27.8	30.5	13.7	15.6	23.9	32.3	44.2	46.7	32.3	40.9	44.4	a+b
CZE	31.4	41.2	45.1	42.9	47.9	48.3	42.9	50.2	50.4	39.2	42.0	46.8	42.9	52.3	52.5	33.2	37.0	40.8	22.5	25.0	33.2	42.9	54.3	56.1	42.9	51.2	53.8	a+b
GBR	52.4	64.6	65.6	57.9	72.8	74.0	55.4	66.6	67.4	56.2	60.9	65.4	57.9	69.4	69.5	44.5	54.0	55.3	36.7	41.6	44.5	57.2	64.8	65.0	56.6	61.4	62.3	a+b
HUN	32.3	38.7	38.7	32.3	44.9	46.7	32.3	40.7	40.7	28.5	31.3	36.3	32.3	42.5	43.0	23.9	27.8	30.5	13.7	15.6	23.9	32.3	36.9	37.9	32.3	40.9	44.4	a+b
IRL	32.3	38.7	38.7	32.3	44.9	46.7	32.3	40.7	40.7	28.5	31.3	36.3	32.3	42.5	43.0	23.9	27.8	30.5	13.7	15.6	23.9	32.3	36.9	37.9	32.3	40.9	44.4	a+b
LTU	36.2	50.2	58.9	39.1	50.1	57.9	47.7	58.4	60.9	50.6	51.6	57.9	52.4	60.6	60.8	42.6	44.3	46.4	28.2	34.2	44.5	49.0	56.6	59.0	57.9	60.4	61.3	a+b
LUX	32.3	38.7	38.7	32.3	44.9	46.7	32.3	40.7	40.7	28.5	31.3	36.3	32.3	42.5	43.0	23.9	27.8	30.5	13.7	15.6	23.9	32.3	44.2	46.7	32.3	40.9	44.4	a+b
LVA	44.9	53.7	54.1	49.2	54.0	54.2	39.6	49.3	51.9	40.2	40.6	49.2	44.0	51.4	51.8	38.8	42.3	44.7	33.6	34.2	38.8	48.9	53.1	53.5	49.2	57.4	59.6	a+b

*The target reliability indices adopted for Denmark were β_t = 3.3 for categories of use A, B, C1 to C3, D1 and D2 and β_t = 3.8 for categories of use C4 and C5

Annex B. Load ratios for the minimum and maximum reliability levels

Table 37 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **reinforced concrete beam**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.7***	***0.2***	***0.0***	***0.3***	***0.7***	***0.2***	***0.0***	***0.5***	***0.7***	***0.3***	***0.0***	***0.4***	***0.7***	***0.2***	***0.7***	***0.3***	***0.0***	***0.4***	**a**+**b**
BEL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a+b
BGR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.0	0.4	0.7	0.3	0.0	0.4	a
CYP	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
CZE	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a+b
DNK	0.1	0.0	0.1	0.4	0.1	0.3	0.1	0.7	0.1	0.4	0.1	0.5	0.1	0.0	0.1	0.5	0.1	0.5	c
FIN	0.7	0.3	0.1	0.4	0.7	0.0	0.1	0.0	0.7	0.0	0.1	0.4	0.1	0.0	0.1	0.4	0.1	0.5	c
FRA	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.5	0.7	0.2	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	a
GBR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.3	a+b
HRV	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.7	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.3	0.0	0.5	a
HUN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a+b
IRL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a+b
LTU	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.7	0.3	a+b
LUX	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a+b
LVA	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.7	0.2	0.0	0.4	0.7	0.3	0.7	0.3	0.0	0.4	a+b
NLD	0.7	0.3	0.7	0.3	0.7	0.3	0.1	0.6	0.1	0.3	0.1	0.4	0.7	0.0	0.7	0.4	0.7	0.4	b
NOR	0.7	0.2	0.0	0.4	0.7	0.3	0.2	0.6	0.7	0.3	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.4	b
PRT	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.3	0.7	0.3	0.0	0.4	a
SVK	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a
SVN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a
SWE	0.7	0.2	0.7	0.3	0.7	0.1	0.3	0.0	0.7	0.2	0.7	0.4	0.7	0.0	0.7	0.4	0.0	0.4	b
CEN	***0.7***	***0.2***	***0.0***	***0.4***	***0.7***	***0.2***	***0.3***	***0.7***	***0.7***	***0.3***	***0.7***	***0.4***	***0.7***	***0.0***	***0.7***	***0.2***	***0.0***	***0.5***	**a+*b***
BEL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.3	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
CZE	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.7	0.7	0.3	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
GBR	0.7	0.3	0.0	0.4	0.7	0.3	0.2	0.6	0.7	0.3	0.7	0.4	0.7	0.0	0.7	0.3	0.7	0.4	a+*b*
HUN	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.3	0.7	0.4	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
IRL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.3	0.7	0.4	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
LTU	0.7	0.1	0.7	0.0	0.7	0.2	0.3	0.0	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.1	0.7	0.2	a+*b*
LUX	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.3	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
LVA	0.7	0.2	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.2	0.7	0.4	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*

Table 38 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **reinforced concrete column**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.7***	***0.3***	***0.0***	***0.4***	***0.7***	***0.3***	***0.0***	***0.5***	***0.0***	***0.3***	***0.0***	***0.4***	***0.7***	***0.2***	***0.7***	***0.3***	***0.0***	***0.4***	**a+b**
BEL	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	a+b
BGR	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.0	0.5	0.7	0.3	0.0	0.4	a
CYP	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	a
CZE	0.7	0.2	0.7	0.3	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	a+b
DNK	0.1	0.3	0.1	0.5	0.1	0.4	0.1	0.7	0.1	0.4	0.1	0.6	0.1	0.0	0.1	0.5	0.1	0.6	c
FIN	0.7	0.3	0.1	0.4	0.7	0.0	0.1	0.0	0.7	0.3	0.1	0.5	0.1	0.0	0.1	0.4	0.1	0.5	c
FRA	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.4	0.0	0.4	a
GBR	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.3	a+b
HRV	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.7	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.4	0.0	0.5	a
HUN	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a+b
IRL	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a+b
LTU	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.0	0.4	a+b
LUX	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	a+b
LVA	0.7	0.3	0.7	0.3	0.7	0.2	0.7	0.2	0.7	0.3	0.0	0.4	0.7	0.3	0.7	0.3	0.0	0.4	a+b
NLD	0.7	0.3	0.7	0.4	0.7	0.3	0.1	0.7	0.1	0.4	0.1	0.5	0.7	0.0	0.7	0.4	0.7	0.4	b
NOR	0.7	0.3	0.0	0.4	0.7	0.3	0.2	0.7	0.7	0.4	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	b
PRT	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.3	0.7	0.3	0.0	0.4	a
SVK	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a
SVN	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a
SWE	0.7	0.3	0.7	0.4	0.7	0.2	0.3	0.0	0.7	0.3	0.7	0.5	0.7	0.0	0.7	0.4	0.0	0.5	b
CEN	***0.7***	***0.2***	***0.0***	***0.4***	***0.7***	***0.2***	***0.3***	***0.7***	***0.7***	***0.4***	***0.0***	***0.5***	***0.7***	***0.0***	***0.7***	***0.2***	***0.0***	***0.5***	**a+*b***
BEL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
CZE	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.7	0.7	0.4	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
GBR	0.7	0.3	0.0	0.4	0.7	0.3	0.2	0.6	0.7	0.3	0.0	0.4	0.7	0.0	0.7	0.4	0.7	0.4	a+*b*
HUN	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.0	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
IRL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.0	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
LTU	0.7	0.1	0.7	0.0	0.7	0.2	0.3	0.0	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.2	0.7	0.5	a+*b*
LUX	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
LVA	0.7	0.2	0.7	0.2	0.7	0.2	0.3	0.0	0.7	0.2	0.0	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*

Table 39 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **reinforced concrete slab**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.7***	***0.2***	***0.0***	***0.3***	***0.7***	***0.2***	***0.0***	***0.5***	***0.0***	***0.3***	***0.0***	***0.4***	***0.7***	***0.2***	***0.7***	***0.3***	***0.0***	***0.4***	***a***+b
BEL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
BGR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.0	0.4	0.7	0.3	0.0	0.4	a
CYP	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
CZE	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
DNK	0.1	0.0	0.1	0.4	0.1	0.3	0.1	0.7	0.1	0.4	0.1	0.5	0.1	0.0	0.1	0.5	0.1	0.5	c
FIN	0.7	0.3	0.1	0.4	0.7	0.0	0.1	0.0	0.7	0.0	0.1	0.4	0.1	0.0	0.1	0.4	0.1	0.5	c
FRA	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	a
GBR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.3	*a*+b
HRV	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.7	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.4	0.0	0.5	a
HUN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	*a*+b
IRL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	*a*+b
LTU	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.7	0.3	*a*+b
LUX	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
LVA	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.7	0.3	0.0	0.4	0.7	0.3	0.7	0.3	0.0	0.4	*a*+b
NLD	0.7	0.3	0.7	0.4	0.7	0.3	0.1	0.6	0.1	0.3	0.1	0.4	0.7	0.0	0.7	0.4	0.7	0.4	b
NOR	0.7	0.2	0.0	0.4	0.7	0.3	0.2	0.6	0.7	0.3	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.4	b
PRT	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.3	0.7	0.3	0.0	0.4	a
SVK	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a
SVN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.7	0.3	0.0	0.4	a
SWE	0.7	0.2	0.7	0.4	0.7	0.1	0.3	0.0	0.7	0.2	0.7	0.4	0.7	0.0	0.7	0.4	0.0	0.4	b
CEN	***0.7***	***0.2***	***0.0***	***0.4***	***0.7***	***0.2***	***0.3***	***0.7***	***0.7***	***0.4***	***0.7***	***0.5***	***0.7***	***0.0***	***0.7***	***0.2***	***0.0***	***0.5***	a+***b***
BEL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.7	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
CZE	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.7	0.7	0.4	0.7	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
GBR	0.7	0.3	0.0	0.4	0.7	0.3	0.2	0.6	0.7	0.3	0.0	0.4	0.7	0.0	0.7	0.3	0.7	0.4	a+*b*
HUN	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.7	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
IRL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.7	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
LTU	0.7	0.1	0.7	0.0	0.7	0.2	0.3	0.0	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.1	0.7	0.2	a+*b*
LUX	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.7	0.4	0.7	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
LVA	0.7	0.2	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.2	0.7	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*

Table 40 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **composite steel concrete slab**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.0***	***0.3***	***0.0***	***0.4***	***0.0***	***0.3***	***0.0***	***0.5***	***0.0***	***0.3***	***0.0***	***0.4***	***0.7***	***0.2***	***0.0***	***0.3***	***0.0***	***0.4***	***a*+b**
BEL	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	*a*+b
BGR	0.7	0.2	0.0	0.3	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.0	0.4	0.0	0.3	0.0	0.4	a
CYP	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	a
CZE	0.7	0.2	0.0	0.3	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	*a*+b
DNK	0.1	0.0	0.1	0.4	0.1	0.3	0.1	0.7	0.1	0.4	0.1	0.5	0.1	0.0	0.1	0.4	0.1	0.5	c
FIN	0.1	0.3	0.1	0.4	0.1	0.3	0.1	0.0	0.1	0.4	0.1	0.5	0.1	0.0	0.1	0.4	0.1	0.5	c
FRA	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.3	0.0	0.4	0.0	0.4	a
GBR	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.3	*a*+b
HRV	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.4	0.0	0.5	a
HUN	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
IRL	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
LTU	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.3	0.0	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.0	0.4	*a*+b
LUX	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.4	0.0	0.4	*a*+b
LVA	0.0	0.3	0.0	0.3	0.7	0.2	0.7	0.2	0.0	0.3	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	*a*+b
NLD	0.7	0.3	0.2	0.4	0.1	0.3	0.1	0.7	0.1	0.4	0.1	0.5	0.7	0.0	0.2	0.4	0.2	0.4	b
NOR	0.7	0.3	0.0	0.4	0.0	0.3	0.2	0.6	0.0	0.3	0.0	0.4	0.7	0.0	0.0	0.4	0.0	0.4	b
PRT	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	a
SVK	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
SVN	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
SWE	0.0	0.3	0.0	0.4	0.7	0.2	0.3	0.0	0.7	0.3	0.0	0.4	0.7	0.0	0.0	0.4	0.0	0.5	b
CEN	***0.7***	***0.2***	***0.0***	***0.4***	***0.0***	***0.4***	***0.3***	***0.7***	***0.0***	***0.4***	***0.0***	***0.5***	***0.7***	***0.0***	***0.0***	***0.4***	***0.0***	***0.5***	**a+*b***
BEL	0.7	0.2	0.0	0.4	0.0	0.4	0.3	0.7	0.0	0.4	0.0	0.5	0.7	0.0	0.0	0.5	0.0	0.5	a+*b*
CZE	0.7	0.1	0.0	0.4	0.0	0.4	0.3	0.7	0.0	0.4	0.0	0.5	0.7	0.0	0.0	0.5	0.0	0.5	a+*b*
GBR	0.0	0.3	0.0	0.4	0.0	0.3	0.2	0.6	0.0	0.3	0.0	0.4	0.7	0.0	0.0	0.4	0.0	0.4	a+*b*
HUN	0.7	0.2	0.0	0.4	0.0	0.4	0.3	0.7	0.0	0.4	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
IRL	0.7	0.2	0.0	0.4	0.0	0.4	0.3	0.7	0.0	0.4	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
LTU	0.7	0.1	0.7	0.0	0.7	0.2	0.3	0.0	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
LUX	0.7	0.2	0.0	0.4	0.0	0.4	0.3	0.7	0.0	0.4	0.0	0.5	0.7	0.0	0.0	0.5	0.0	0.5	a+*b*
LVA	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.0	0.7	0.2	0.0	0.5	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*

Table 41 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **steel tie**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.7***	***0.2***	***0.0***	***0.3***	***0.7***	***0.2***	***0.0***	***0.4***	***0.7***	***0.2***	***0.7***	***0.3***	***0.7***	***0.2***	***0.7***	***0.2***	***0.0***	***0.3***	***a*+b**
BEL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.3	0.0	0.3	*a*+b
BGR	0.7	0.2	0.7	0.2	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.3	0.7	0.2	0.7	0.3	a
CYP	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.3	0.0	0.3	a
CZE	0.7	0.2	0.7	0.2	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.3	0.0	0.3	*a*+b
DNK	0.7	0.0	0.1	0.3	0.7	0.0	0.1	0.5	0.1	0.3	0.1	0.4	0.7	0.0	0.1	0.3	0.1	0.4	c
FIN	0.7	0.0	0.1	0.0	0.7	0.0	0.1	0.0	0.7	0.0	0.1	0.4	0.1	0.0	0.1	0.0	0.1	0.4	c
FRA	0.7	0.2	0.7	0.2	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.3	0.0	0.3	a
GBR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.7	0.3	*a*+b
HRV	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.6	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.3	0.0	0.4	a
HUN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.0	0.3	*a*+b
IRL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.0	0.3	*a*+b
LTU	0.7	0.1	0.7	0.2	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.7	0.1	0.7	0.2	0.7	0.3	*a*+b
LUX	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.0	0.3	0.0	0.3	*a*+b
LVA	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.0	0.3	*a*+b
NLD	0.7	0.0	0.7	0.3	0.7	0.2	0.1	0.5	0.7	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.7	0.0	b
NOR	0.7	0.1	0.7	0.3	0.7	0.1	0.2	0.5	0.7	0.2	0.7	0.3	0.7	0.0	0.7	0.3	0.7	0.3	b
PRT	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.0	0.3	a
SVK	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.0	0.3	a
SVN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.4	0.7	0.2	0.7	0.3	0.7	0.2	0.7	0.2	0.0	0.3	a
SWE	0.7	0.1	0.7	0.2	0.7	0.1	0.3	0.0	0.7	0.1	0.7	0.2	0.7	0.0	0.7	0.2	0.0	0.3	b
CEN	***0.7***	***0.1***	***0.7***	***0.2***	***0.7***	***0.2***	***0.3***	***0.5***	***0.7***	***0.2***	***0.7***	***0.2***	***0.7***	***0.0***	***0.7***	***0.2***	***0.7***	***0.4***	**a+*b***
BEL	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.5	0.7	0.2	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*
CZE	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.5	0.7	0.2	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*
GBR	0.7	0.2	0.0	0.3	0.7	0.2	0.2	0.5	0.7	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.7	0.3	a+*b*
HUN	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.5	0.7	0.2	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*
IRL	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.5	0.7	0.2	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*
LTU	0.7	0.1	0.7	0.1	0.7	0.1	0.7	0.0	0.7	0.1	0.7	0.1	0.7	0.0	0.7	0.1	0.7	0.2	a+*b*
LUX	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.5	0.7	0.2	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*
LVA	0.7	0.1	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.1	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*

Table 42 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **steel column**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.7***	***0.2***	***0.0***	***0.3***	***0.7***	***0.2***	***0.0***	***0.5***	***0.0***	***0.3***	***0.0***	***0.4***	***0.7***	***0.2***	***0.0***	***0.3***	***0.0***	***0.4***	***a***+b
BEL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
BGR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.3	0.0	0.4	0.7	0.3	0.0	0.4	a
CYP	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
CZE	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
DNK	0.7	0.0	0.1	0.4	0.7	0.3	0.1	0.7	0.1	0.4	0.1	0.4	0.1	0.0	0.1	0.4	0.1	0.4	c
FIN	0.1	0.3	0.1	0.4	0.7	0.0	0.1	0.0	0.1	0.3	0.1	0.4	0.1	0.0	0.1	0.4	0.1	0.5	c
FRA	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	a
GBR	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.7	0.3	*a*+b
HRV	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.7	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.4	0.0	0.5	a
HUN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
IRL	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
LTU	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.0	0.7	0.3	0.0	0.3	*a*+b
LUX	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	*a*+b
LVA	0.7	0.2	0.0	0.3	0.7	0.2	0.7	0.2	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	*a*+b
NLD	0.7	0.3	0.7	0.4	0.1	0.3	0.1	0.6	0.1	0.3	0.1	0.4	0.7	0.0	0.2	0.4	0.2	0.4	b
NOR	0.7	0.2	0.0	0.4	0.7	0.3	0.2	0.6	0.7	0.3	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.4	b
PRT	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.3	0.0	0.3	0.0	0.4	a
SVK	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
SVN	0.7	0.2	0.0	0.3	0.7	0.2	0.0	0.5	0.0	0.3	0.0	0.4	0.7	0.2	0.0	0.3	0.0	0.4	a
SWE	0.7	0.3	0.7	0.4	0.7	0.2	0.3	0.0	0.7	0.2	0.7	0.4	0.7	0.0	0.7	0.4	0.0	0.4	b
CEN	***0.7***	***0.2***	***0.0***	***0.4***	***0.7***	***0.2***	***0.3***	***0.7***	***0.0***	***0.4***	***0.7***	***0.4***	***0.7***	***0.0***	***0.7***	***0.2***	***0.0***	***0.5***	**a+*b***
BEL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.0	0.4	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
CZE	0.7	0.1	0.7	0.2	0.7	0.2	0.3	0.7	0.0	0.4	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
GBR	0.7	0.3	0.0	0.4	0.7	0.3	0.2	0.6	0.0	0.3	0.0	0.4	0.7	0.0	0.7	0.4	0.7	0.4	a+*b*
HUN	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.0	0.4	0.7	0.4	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
IRL	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.0	0.4	0.7	0.4	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
LTU	0.7	0.1	0.7	0.0	0.7	0.2	0.3	0.0	0.7	0.2	0.7	0.1	0.7	0.0	0.7	0.2	0.7	0.4	a+*b*
LUX	0.7	0.2	0.0	0.4	0.7	0.2	0.3	0.7	0.0	0.4	0.7	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+*b*
LVA	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.0	0.7	0.2	0.7	0.4	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*

Table 43 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **timber beam**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.0***	***0.4***	***0.0***	***0.5***	***0.0***	***0.4***	***0.0***	***0.7***	***0.0***	***0.4***	***0.0***	***0.5***	***0.7***	***0.1***	***0.0***	***0.5***	***0.0***	***0.6***	**a**+b
BEL	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a+b
BGR	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.6	a
CYP	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a
CZE	0.0	0.3	0.0	0.4	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a+b
DNK	0.1	0.5	0.1	0.7	0.1	0.5	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.0	0.1	0.7	0.1	0.7	c
FIN	0.1	0.5	0.1	0.6	0.1	0.4	0.1	0.0	0.1	0.5	0.1	0.7	0.1	0.7	0.1	0.6	0.1	0.7	c
FRA	0.0	0.3	0.0	0.4	0.0	0.3	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.3	0.0	0.5	0.0	0.6	a
GBR	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.5	a+b
HRV	0.0	0.5	0.0	0.6	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.0	0.5	0.0	0.5	0.0	0.7	a
HUN	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a+b
IRL	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a+b
LTU	0.7	0.3	0.7	0.3	0.0	0.3	0.7	0.3	0.0	0.4	0.0	0.4	0.7	0.0	0.0	0.4	0.0	0.5	a+b
LUX	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a+b
LVA	0.0	0.4	0.0	0.4	0.0	0.3	0.7	0.0	0.0	0.4	0.0	0.5	0.7	0.3	0.0	0.5	0.0	0.6	a+b
NLD	0.1	0.4	0.2	0.5	0.1	0.5	0.1	0.7	0.1	0.5	0.1	0.6	0.7	0.0	0.2	0.5	0.2	0.6	b
NOR	0.0	0.4	0.0	0.6	0.0	0.5	0.2	0.7	0.0	0.5	0.0	0.7	0.7	0.0	0.0	0.6	0.0	0.7	b
PRT	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.3	0.0	0.5	0.0	0.6	a
SVK	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a
SVN	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.6	a
SWE	0.0	0.4	0.0	0.5	0.0	0.4	0.3	0.0	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.7	b
CEN	***0.0***	***0.5***	***0.0***	***0.6***	***0.0***	***0.5***	***0.3***	***0.7***	***0.0***	***0.5***	***0.0***	***0.7***	***0.7***	***0.0***	***0.0***	***0.6***	***0.0***	***0.7***	**a+*b***
BEL	0.0	0.5	0.0	0.6	0.0	0.5	0.3	0.7	0.0	0.5	0.0	0.7	0.7	0.0	0.0	0.6	0.0	0.7	a+*b*
CZE	0.7	0.2	0.0	0.6	0.0	0.5	0.3	0.7	0.0	0.5	0.0	0.7	0.7	0.0	0.0	0.6	0.0	0.7	a+*b*
GBR	0.0	0.4	0.0	0.5	0.0	0.4	0.2	0.7	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.5	a+*b*
HUN	0.0	0.5	0.0	0.6	0.0	0.5	0.3	0.7	0.0	0.5	0.0	0.7	0.7	0.0	0.0	0.6	0.0	0.7	a+*b*
IRL	0.0	0.5	0.0	0.6	0.0	0.5	0.3	0.7	0.0	0.5	0.0	0.7	0.7	0.0	0.0	0.6	0.0	0.7	a+*b*
LTU	0.7	0.1	0.7	0.0	0.0	0.4	0.3	0.0	0.0	0.5	0.3	0.6	0.7	0.0	0.4	0.5	0.0	0.6	a+*b*
LUX	0.0	0.5	0.0	0.6	0.0	0.5	0.3	0.7	0.0	0.5	0.0	0.7	0.7	0.0	0.0	0.6	0.0	0.7	a+*b*
LVA	0.0	0.5	0.0	0.6	0.0	0.4	0.3	0.0	0.0	0.5	0.0	0.7	0.3	0.0	0.0	0.6	0.0	0.7	a+*b*

Table 44 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **timber column**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.0***	***0.5***	***0.0***	***0.7***	***0.0***	***0.5***	***0.0***	***0.7***	***0.0***	***0.6***	***0.0***	***0.7***	***0.7***	***0.1***	***0.0***	***0.6***	***0.0***	***0.7***	***a*+b**
BEL	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.7	0.0	0.7	*a*+b
BGR	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.0	0.7	0.0	0.6	0.0	0.7	a
CYP	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.7	0.0	0.7	a
CZE	0.0	0.4	0.0	0.6	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.7	0.0	0.7	*a*+b
DNK	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.0	0.1	0.7	0.1	0.7	c
FIN	0.1	0.6	0.1	0.7	0.1	0.6	0.1	0.0	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.7	c
FRA	0.0	0.4	0.0	0.6	0.0	0.4	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.4	0.0	0.7	0.0	0.7	a
GBR	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.6	0.0	0.6	*a*+b
HRV	0.0	0.7	0.0	0.7	0.0	0.7	0.0	0.7	0.0	0.7	0.0	0.7	0.0	0.7	0.0	0.7	0.0	0.7	a
HUN	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.6	0.0	0.7	*a*+b
IRL	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.6	0.0	0.7	*a*+b
LTU	0.0	0.3	0.7	0.3	0.0	0.4	0.7	0.2	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.7	*a*+b
LUX	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.7	0.0	0.7	*a*+b
LVA	0.0	0.5	0.0	0.6	0.0	0.4	0.7	0.0	0.0	0.5	0.0	0.7	0.0	0.4	0.0	0.6	0.0	0.7	*a*+b
NLD	0.1	0.5	0.2	0.7	0.1	0.6	0.1	0.7	0.1	0.7	0.1	0.7	0.2	0.0	0.2	0.7	0.2	0.7	b
NOR	0.0	0.6	0.0	0.7	0.0	0.6	0.2	0.7	0.0	0.7	0.0	0.7	0.7	0.0	0.0	0.7	0.0	0.7	b
PRT	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.0	0.4	0.0	0.6	0.0	0.7	a
SVK	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.6	0.0	0.7	a
SVN	0.0	0.5	0.0	0.7	0.0	0.5	0.0	0.7	0.0	0.6	0.0	0.7	0.7	0.1	0.0	0.6	0.0	0.7	a
SWE	0.0	0.6	0.0	0.7	0.0	0.5	0.3	0.0	0.0	0.6	0.0	0.7	0.7	0.0	0.0	0.7	0.0	0.7	b
CEN	***0.0***	***0.6***	***0.0***	***0.7***	***0.0***	***0.7***	***0.3***	***0.7***	***0.0***	***0.7***	***0.0***	***0.7***	***0.4***	***0.0***	***0.0***	***0.7***	***0.0***	***0.7***	**a+*b***
BEL	0.0	0.6	0.0	0.7	0.0	0.7	0.3	0.7	0.0	0.7	0.0	0.7	0.4	0.0	0.0	0.7	0.0	0.7	a+*b*
CZE	0.0	0.5	0.0	0.7	0.0	0.7	0.3	0.7	0.0	0.7	0.0	0.7	0.4	0.0	0.0	0.7	0.0	0.7	a+*b*
GBR	0.0	0.5	0.0	0.7	0.0	0.6	0.2	0.7	0.0	0.7	0.0	0.7	0.7	0.0	0.0	0.7	0.0	0.7	a+*b*
HUN	0.0	0.6	0.0	0.7	0.0	0.7	0.3	0.7	0.0	0.7	0.0	0.7	0.4	0.0	0.0	0.7	0.0	0.7	a+*b*
IRL	0.0	0.6	0.0	0.7	0.0	0.7	0.3	0.7	0.0	0.7	0.0	0.7	0.4	0.0	0.0	0.7	0.0	0.7	a+*b*
LTU	0.7	0.2	0.7	0.0	0.0	0.6	0.3	0.0	0.0	0.7	0.3	0.7	0.7	0.0	0.0	0.7	0.0	0.7	a+*b*
LUX	0.0	0.6	0.0	0.7	0.0	0.7	0.3	0.7	0.0	0.7	0.0	0.7	0.4	0.0	0.0	0.7	0.0	0.7	a+*b*
LVA	0.0	0.6	0.0	0.7	0.0	0.6	0.3	0.0	0.0	0.7	0.0	0.7	0.3	0.0	0.0	0.7	0.0	0.7	a+*b*

Table 45 - χ values for the minimum and maximum reliability levels (β) considering the categories of imposed loads A to D2 – **masonry wall**

MS\Cat	A		B		C1		C2		C3		C4		C5		D1		D2		Load comb.
	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	$\chi\|\beta_{min}$	$\chi\|\beta_{max}$	
CEN	***0.0***	***0.3***	***0.0***	***0.5***	***0.0***	***0.3***	***0.0***	***0.6***	***0.0***	***0.4***	***0.0***	***0.5***	***0.7***	***0.1***	***0.0***	***0.4***	***0.0***	***0.5***	**a+b**
BEL	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.5	a+b
BGR	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.0	0.6	0.0	0.4	0.0	0.5	a
CYP	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.5	a
CZE	0.7	0.3	0.0	0.4	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.5	a+b
DNK	0.1	0.5	0.1	0.7	0.1	0.5	0.1	0.7	0.1	0.7	0.1	0.7	0.1	0.0	0.1	0.7	0.1	0.7	c
FIN	0.1	0.4	0.1	0.5	0.1	0.4	0.1	0.0	0.1	0.4	0.1	0.6	0.1	0.6	0.1	0.5	0.1	0.6	c
FRA	0.7	0.3	0.0	0.4	0.7	0.2	0.0	0.6	0.7	0.4	0.0	0.4	0.7	0.5	0.0	0.4	0.0	0.4	a
GBR	0.7	0.3	0.0	0.4	0.7	0.3	0.0	0.6	0.0	0.4	0.0	0.3	0.7	0.2	0.0	0.4	0.0	0.4	a+b
HRV	0.0	0.4	0.0	0.5	0.0	0.4	0.0	0.7	0.0	0.4	0.0	0.6	0.0	0.5	0.0	0.4	0.0	0.6	a
HUN	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.4	0.0	0.5	a+b
IRL	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.4	0.0	0.5	a+b
LTU	0.7	0.2	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.4	0.0	0.4	0.7	0.0	0.7	0.4	0.0	0.4	a+b
LUX	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.5	0.0	0.5	a+b
LVA	0.7	0.3	0.0	0.4	0.7	0.3	0.7	0.1	0.7	0.3	0.0	0.5	0.7	0.3	0.0	0.4	0.0	0.5	a+b
NLD	0.1	0.4	0.2	0.5	0.1	0.5	0.1	0.7	0.1	0.5	0.1	0.7	0.7	0.0	0.2	0.6	0.2	0.6	b
NOR	0.0	0.4	0.0	0.5	0.0	0.4	0.2	0.7	0.0	0.4	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.6	b
PRT	0.7	0.3	0.0	0.4	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.3	0.0	0.4	0.0	0.5	a
SVK	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.4	0.0	0.5	a
SVN	0.0	0.3	0.0	0.5	0.0	0.3	0.0	0.6	0.0	0.4	0.0	0.5	0.7	0.1	0.0	0.4	0.0	0.5	a
SWE	0.7	0.3	0.7	0.4	0.7	0.1	0.3	0.0	0.7	0.4	0.0	0.5	0.7	0.0	0.7	0.4	0.0	0.5	b
CEN	***0.0***	***0.4***	***0.0***	***0.5***	***0.0***	***0.4***	***0.3***	***0.7***	***0.0***	***0.5***	***0.0***	***0.6***	***0.7***	***0.0***	***0.0***	***0.5***	***0.0***	***0.6***	**a+*b***
BEL	0.0	0.4	0.0	0.5	0.0	0.4	0.3	0.7	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.6	a+*b*
CZE	0.7	0.2	0.0	0.5	0.0	0.2	0.3	0.7	0.0	0.4	0.0	0.5	0.7	0.0	0.0	0.5	0.0	0.6	a+*b*
GBR	0.7	0.3	0.0	0.5	0.7	0.3	0.2	0.6	0.0	0.4	0.0	0.4	0.7	0.0	0.7	0.4	0.7	0.5	a+*b*
HUN	0.0	0.4	0.0	0.5	0.0	0.4	0.3	0.7	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.6	a+*b*
IRL	0.0	0.4	0.0	0.5	0.0	0.4	0.3	0.7	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.6	a+*b*
LTU	0.7	0.1	0.7	0.0	0.7	0.2	0.3	0.0	0.7	0.2	0.3	0.5	0.7	0.0	0.7	0.2	0.0	0.5	a+*b*
LUX	0.0	0.4	0.0	0.5	0.0	0.4	0.3	0.7	0.0	0.5	0.0	0.6	0.7	0.0	0.0	0.5	0.0	0.6	a+*b*
LVA	0.7	0.4	0.0	0.4	0.7	0.2	0.3	0.0	0.7	0.2	0.0	0.6	0.7	0.0	0.7	0.5	0.0	0.6	a+*b*

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