

**DRAFT ROYAL DECREE ADOPTING THE
EARTHQUAKE-RESISTANT CONSTRUCTION
STANDARD NCSR-23**

REGULATORY IMPACT ANALYSIS REPORT

Madrid, 21 March 2023

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EXECUTIVE SUMMARY

Proposing Ministry/Body	MINISTRY OF TRANSPORT, MOBILITY AND URBAN AGENDA DIRECTORATE-GENERAL OF THE NATIONAL GEOGRAPHICAL INSTITUTE	Date	21 March 2023
Title of the Order	Royal Decree adopting the Earthquake-Resistant Construction Standard NCSR-23		
Report type	Normal <input checked="" type="checkbox"/> Abbreviated <input type="checkbox"/>		
TIMELINESS OF THE PROPOSAL			
Matter regulated	Establish the regulatory framework in which the requirements and criteria for earthquake-resistant construction are set by updating the 'Earthquake-Resistant Construction Standard NCSE-02: General Part and Building', adopted by Royal Decree 997/2002, of 27 September 2002 and the 'Earthquake-Resistant Construction Standard NCSP-07: Part of Bridges', adopted by Royal Decree 637/2007, of 18 May 2007.		
Objectives pursued	<p>Incorporate the most relevant aspects of European regulations for the calculation of structures in seismic areas, in accordance with the procedures established in the Euro-Structural Codes.</p> <p>Extend the scope of the current regulatory framework (which concerns only buildings and bridges) to also include other types of structures such as: towers, masts, chimneys, silos, tanks, pipes; as well as extending the treatment given to the seismic criteria applicable to the geotechnical project.</p> <p>Update the current values of the parameters that define seismic hazard and the proposed formulation for the definition of the seismic action, according to the current state</p>		

	<p>of knowledge.</p> <p>Regulate other aspects of the earthquake-resistant project that does not (or which contemplates in a brief way) the current regulation.</p>
Main alternatives considered	<p>Since the duties of the Standing Committee on Earthquake-Resistant Construction Standards include updating the earthquake-resistant regulations, and having agreed to support the following update of the Earthquake-Resistant Construction Standard in Eurocode 8, the following two alternatives have been discarded, for not fulfilling efficiently the objectives pursued with the adoption of this Royal Decree:</p> <ul style="list-style-type: none"> - Maintain the regulations currently in force. - Drafting of a new earthquake-resistant standard based on other possible scientific-technical and technological frameworks.
CONTENT AND LEGAL ANALYSIS	
Type of standard	Royal Decree
Structure of the regulation	<p>This draft contains:</p> <ul style="list-style-type: none"> - A preamble. - The enacting terms, consisting of two articles. - A Transitory Provision. - A Derogatory Provision. - Four Final Provisions. - The Annex, which incorporates the six annexes comprising the Earthquake-Resistant Construction Standard.
Reports compiled	<p>The project has been prepared within the Standing Committee on Earthquake-Resistant Standards, based in the National Geographical Institute (Ministry of Transport, Mobility and Urban Agenda-MITMA), and of which representatives of the ministerial departments related to the purposes of the Commission (MITMA, M. Interior, M. Defence, M. Industry, Trade and Tourism, and M. Science and Innovation) are members of other bodies such as the Nuclear Safety Council (CSN) and the Spanish Commission of Geodesy and Geophysics (CEGG) and members of the</p>

	Spanish Association of Seismic Engineering (AEIS).	
Hearing	<p>In compliance with Article 133.2 of Law 39/2015 of 1 October 2015 on the Common Administrative Procedure of Public Administrations and Article 26.6 of Law 50/1997 of 27 November 1997, and in accordance with the provisions of Order PRE/1590/2016 of 3 October 2016 publishing the Agreement of the Council of Ministers of 30 September 2016 issuing instructions to enable public participation in the process of regulatory development through the web portals of the ministerial departments, the 'audience and public information' is proposed on the draft Royal Decree of reference in order to obtain the opinion of citizens who hold rights and legitimate interests affected by this standard.</p> <p>As a Technical Regulation, it has been subject to the procedure established in Royal Decree 1337/1999, of 31 July 1999, which regulates the transmission of information in the field of technical standards and regulations, in application of Directive (EU) 2015/1535.</p>	
IMPACT ANALYSIS		
COMPLIANCE WITH THE DISTRIBUTION OF POWERS	<p>This Royal Decree is adopted pursuant to the provisions of Article 149.1(13) of the Constitution granting the State power regarding the principles and coordination of general economic planning.</p> <p>The elaboration of a proposal for an earthquake-resistant standard is a consequence of the functions entrusted to the National Geographical Institute by Royal Decree 645/2020, of 7 July 2020.</p>	
ECONOMIC AND BUDGETARY IMPACT	<p>General impact on the economy.</p>	<p>The application of the new Earthquake-Resistant Construction Standard represents, compared to previous regulations, a clarification of the requirements required of structures in seismic areas without causing an increase in expenditure.</p> <p>The standard contains the necessary regulation to meet the need described above, without there being other measures less restrictive of rights or imposing fewer obligations on the addressees.</p>

	With regard to competition	This draft Royal Decree does not distort competition on the market, but favours it by regulating aspects not covered by the current regulations.
	From the point of view of administrative burdens	This standard does not entail an increase in additional administrative burdens.
	From the point of view of the budget	It does not imply an increase in public spending or a decrease in government revenues.
GENDER IMPACT	The gender impact of the standard is	<div>Negative <input type="checkbox"/></div> <div>None <input type="checkbox"/></div> <div>Positive <input type="checkbox"/></div>
OTHER IMPACTS CONSIDERED	<p>It has no impact on the grounds of opportunities, non-discrimination and universal accessibility for persons with disabilities.</p> <p>It has no impact on family, childhood and adolescence.</p> <p>It has a positive impact because of climate change.</p>	
OTHER CONSIDERATIONS	Increases structural safety against the occurrence of destructive earthquakes.	

I. DESIRABILITY OF THE PROPOSAL

1. Motivation and objectives

The Standing Committee on Earthquake-Resistant Standards is an inter-ministerial collegiate body, created by Decree 3209/1974 of 30 August 1974, attached to the Ministry of Transport, Mobility and Urban Agenda and part of the General Directorate of the National Geographical Institute, as established in Royal Decree 645/2020 of 7 July 2020, which develops the basic organisational structure of the Ministry of Transport, Mobility and Urban Agenda.

The Commission's functions include the following, in accordance with Article 2(a) and (b) of Royal Decree 518/1984 of 22 February 1984 reorganising its composition:

- Study, develop and propose earthquake-resistant standards applied to the fields of engineering and architecture
- Promote on a permanent basis and regularly update these rules, proposing amendments as appropriate in accordance with the progress of the earthquake-resistant technique and the experience gained in its application.

This Royal Decree adopting the Earthquake-Resistant Construction Standard NCSR-23 responds to a double motivation: on the one hand, update the current regulations regarding the earthquake-resistant structure project in order to adapt it to the continuous new needs and the advancement of the technique; and on the other hand, to ensure that this regulation constitutes a technical framework consistent with that established in the Structural Code, adopted by Royal Decree 470/2021, of 29 June 2021, and in the Technical Building Code, adopted by Royal Decree 314/2006, of 17 March 2006.

Thus, the main objectives and some of the most important novelties of this new earthquake-resistant construction standard are the following:

- Incorporate the most relevant aspects of European regulations for the calculation of structures, in accordance with the procedures laid down in the Euro-Structural Codes.
- Extend the scope of the Earthquake-Resistant Construction Standard to include structural types not explicitly covered to date, namely: towers, masts, chimneys, silos, tanks, pipes, containment structures and their foundations, as well as the geotechnical project before seismic actions.
- Regulate several aspects that do not contemplate (or which very briefly contemplate) the current regulation, such as, for example: the project and verification of non-structural elements subject to seismic actions; the classification of structural elements into primary and secondary seismic

elements; the earthquake-resistant assessment and adequacy of existing buildings; and the project of structures with base insulation.

- Update various aspects that, although regulated in the current regulations, their modification is considered appropriate to adapt them to a more current state of knowledge, such as, for example, the representation of seismic action and the parameters that define the seismic danger on the territory, which have been altered by the new studies carried out and conditioned by the seismic activity registered in the previous 20 years.

2. Analysis of alternatives

The following two alternatives were initially analysed in the development of the new NCSR-23 Earthquake-Resistant Construction Standard, which were discarded for the reasons given.

As a first formal possibility, the scenario of maintaining the validity of the current regulations on earthquake-resistant construction was raised: Royal Decree 997/2002 of 27 September adopting the Earthquake-Resistant Construction Standard: General Part and Building (NCSE-02) and Royal Decree 637/2007, of 18 May 2007, adopting the Earthquake-Resistant Construction Standard: Bridges (NCSP-07).

This alternative is not acceptable, as it does not address any of the needs and objectives set out in point I.1 of this document.

As a second alternative, the possibility was considered of developing a new national standard by drafting a new normative text, modifying or updating NCSE-02 and NCSP-07, in everything necessary to conform to the current state of knowledge and in particular with regard to the parameters defining seismic hazard.

This second alternative was also ruled out due to the time involved in the complete design of a new standard, also considering the existence of a European regulation, Eurocode 8, drafted by the best European specialists in this discipline, which is consistent with the rest of the Spanish structural regulations and which specifically includes the design of structural typologies and other aspects not covered by the existing seismic construction standards.

Thus, as a final decision, the Commission, after assessing and ruling out the two previous alternatives, chose this third option, deciding that updating the earthquake-resistant construction standard would be performed by adopting Eurocode 8 and its corresponding National Annex.

Regarding this solution, two possibilities for its implementation were subsequently raised:

- a first, consisting of adopting the full content of the UNE-EN 1998 series of standards (UNE-EN 1998, Parts 1 to 6) by means of a direct reference (remissory technique), that is to say, replacing the Standard with a mere reference in the Royal Decree referring to compliance with Eurocode 8, and
- a second, consisting of the transcription of the texts of UNE-EN 1998 to form the new NCSR-23 regulatory body, adapting the corresponding regulatory references and incorporating into the body of the standard all the parameters and requirements included in their corresponding National Annexes.

It is this second way that has finally been chosen to materialise the adoption of Eurocode 8, since the option of using the referring technique is invalidated for the reasons set out below.

The use of a direct reference to Eurocodes in the present draft legislation presents a number of drawbacks, but mainly certain legal problems. These problems, which are described below, have been corroborated by the Opinion of the Council of State No 1083/2019, which assessed the incorporation of different UNE-EN standards relating to Eurocodes into the Structural Code, in a manner similar to that contained in this draft regulation.

Direct reference to Eurocodes involves adopting not only the six parts of Eurocode 8 of the 'scope' of the Standing Committee on Earthquake-Resistant Standards, but also other Eurocodes, as some are cited in Eurocode 8 (such as Eurocode 2, which sets out the requirements for the concrete structure project, Eurocode 1, which sets out actions in structures, or Eurocode 5 for wooden structures) and many of them are interrelated.

In some of these cases, certain laws (e.g. the Building Planning Act, the Roads Act, etc.) as well as different regulations (structural code, technical building code, instruction on the actions to be considered in the road bridge project, or the instruction on the actions to be considered in the railway bridge project) would be infringed, as the latter regulate aspects considered in other Eurocodes cited in Eurocode 8.

In addition, all would entail a proposal being undertaken that would go beyond the scope of the powers assigned to the aforementioned Commission (and which correspond to other administrative bodies).

3. Adherence to the principles of sound regulation

This standard complies with the principles of good regulation established in Article 129 of Law 39/2015.

With regard to the compliance of the standard with the principles of **need and efficiency**, it should be noted that it responds to the need, for reasons of

general interest, to update the current regulations concerning the earthquake-resistant project of structures, in accordance with the technical and regulatory developments affecting the content of that regulation. The elaboration of a new Earthquake-Resistant Construction Standard will allow the two previous regulations to be repealed (Royal Decree 997/2002 of 27 September 2002 adopting the Earthquake-Resistant Construction Standard: General Part and Building, NCSE-02, and Royal Decree 637/2007, of 18 May 2007, adopting the Earthquake-Resistant Construction Standard: Bridges, NCSP-07), collecting in a single updated regulation the requirements for the seismic design of buildings, bridges, towers, masts, chimneys, silos, tanks, pipes, containment structures and their foundations, as well as the geotechnical project.

This project is also consistent with the principle of **proportionality**, since the standard contains the necessary regulation to meet the need described above, without there being other measures less restrictive of rights or imposing fewer obligations on the addressees.

The principle of **legal certainty** is also fulfilled with this project, given its integration into the legal system, in full coherence with the national and European regulations in force, as detailed in sections III.2 and III.3 of this report, relating to its relationship with other rules of national law and with other rules of European Union law.

Likewise, it complies with the principle of **transparency**, since the project has been submitted to the procedure of prior public consultation, pursuant to the provisions of Article 133 of Law 39/2015 and Article 26.2 of Law 50/1997, of the Government, and the process of hearing and public information, in compliance with the provisions of Article 26.6 of Law 50/1997, which has allowed the participation of potential recipients in the elaboration of this standard. In addition, its content has been included in the transparency portal of the Government of Spain and once adopted and published in the Official State Gazette, it will be available for consultation by all interested parties. In addition, the principle of transparency is also fulfilled, in defining the rule clearly its objectives, reflected in its preamble and in this report.

In accordance with the provisions of Article 25 of Law 50/1997, of 27 November 1997, on the Government, the project was included in the Annual Regulatory Plan (PAN) of 2022 and an extension was requested by 2023.

Finally, it is in line with the principle of **efficiency** because it does not mean an increase in administrative burdens or an increase in public spending.

II. CONTENT

The draft Royal Decree consists of:

- A preamble.
- The enacting terms, composed of two articles.
- A transitory provision.
- A derogatory provision.
- Four final provisions.
- The Annex, which incorporates the six annexes comprising the Earthquake-Resistant Construction Standard.

Articulate

- Article one: the object.

The Earthquake-Resistant Construction Standard, NCSR-23, is hereby adopted, which establishes the essential concepts and requirements to be met by structures located in seismic zones, in Spain, in addition to compliance with the rest of the specific regulations in force regarding structures.

The structures and constructions that may be subjected to the action of earthquakes will be projected, executed and documented considering the seismic action in accordance with the provisions of the six Annexes that constitute this Earthquake-Resistant Standard and which are:

Annex 1: General rules, seismic actions and rules for construction.

Annex 2: Bridges.

Annex 3: Assessment and seismic adequacy of buildings.

Annex 4: Silos, tanks and pipes.

Annex 5: Foundations, containment structures and geotechnical aspects.

Annex 6: Towers, masts and chimneys.

Alternatively, the author of the project and the optional management may, in use of their powers, under their responsibility and prior agreement of the owner, adopt other solutions that partially or totally depart from the procedures referred to in the preceding annexes (through different calculation systems, construction arrangements, etc.), provided that it is documented that the structure complies with the requirements of this Earthquake-Resistant Standard, achieving at least equivalent services to those that would be obtained by the application of the procedures of this Standard.

- Article two: the scope of application.

The requirements for earthquake-resistant content of this Standard apply to all projects and construction works of new buildings, bridges, towers, masts, chimneys, silos, tanks, pipes, containment structures and their foundations, as well as to the geotechnical project.

Likewise, this Standard applies to the seismic evaluation of existing buildings, and also, where appropriate, to the seismic suitability thereof, in cases where significant renovation or structural rehabilitation works are carried out or when such assessment or adaptation is required. For the purposes of this Earthquake-Resistant Standard, seismic suitability covers both the reinforcement of undamaged structures and the reinforcement of structures damaged by an earthquake.

The conditions that may necessitate the seismic assessment of individual buildings – possibly leading to seismic suitability – fall outside the subject matter and scope of this Standard.

As appropriate, this Earthquake-Resistant Standard may also be applied in addition to other structural types not explicitly included in its scope, where they do not exist for the same specific standards or provisions, and provided that they are not expressly excluded from its scope.

Provisions

- Single transitional provision: Application to designs and works

The provisions of this Royal Decree will not apply in civil works to projects whose order of drafting or study, in the field of public administrations, or commission, in other cases, had been carried out prior to the entry into force of this Royal Decree, as well as to the works carried out in the development thereof, provided that they are initiated within a period not exceeding two years from that entry into force, unless the competent public administration, or, where appropriate, the promoter, agrees that it is mandatory.

The provisions of this Royal Decree will not be applicable in the field of building to projects that have requested municipal works license or request it within nine months of the entry into force of this Royal Decree, applying in this case Royal Decree 997/2002, of 27 September 2002, adopting the Earthquake-Resistant Construction Standard: General Part and Building (NCSE-02). Such works must begin within the maximum period of effectiveness of the said licence, in accordance with its regulatory regulations, and, failing that, within a period not exceeding six months from the date of granting of the said licence. Otherwise, the projects must be adapted to the provisions of this Royal Decree.

- Single derogatory provision: Repeal of regulations.

As of the entry into force of this Royal Decree, Royal Decree 997/2002 of 27 September 2022 adopting the Earthquake-Resistant Construction Standard are repealed: General Part and Building (NCSE-02), and Royal Decree 637/2007, of 18 May 2007, adopting the Earthquake-Resistant Construction Standard: Bridges (NCSP-07).

- First final provision: Title of competence.

This Royal Decree has a basic character and is issued under the provisions of Article 149.1(13) of the Spanish Constitution, which confers on the State exclusive competence over the basis and coordination of the general planning of economic activity.

- Second final provision: Implementation authority.

The holder of the Ministry of Transport, Mobility and Urban Agenda is empowered to issue the necessary provisions for the development and application of the provisions of this Royal Decree.

- Third final provision:

Authorisation for the updating of Appendices E, F and G of Annex 1 to the Earthquake-Resistant Construction Standard.

The holder of the Ministry of Transport, Mobility and Urban Agenda is authorised to update the hazard map defined in Appendices E and F to Annex 1 and the list of standards referred to in Appendix G to Annex 1, where such updates are intended to bring those contents into line with the progress of the technique or with Community legislation.

- Fourth final provision: Entry into force.

This Royal Decree will enter into force on 1 July 2023.

The content of the Annex

The Annex incorporates the Earthquake-Resistant Construction Standard, which consists of six annexes. The list of *Annexes* is as follows:

- Annex 1. General rules, seismic actions and rules for construction.
- Annex 2. Bridges.
- Annex 3. Assessment and seismic adequacy of buildings.
- Annex 4. Silos, tanks and pipes.
- Annex 5. Foundations, containment structures and geotechnical aspects.
- Annex 6. Towers, masts and chimneys.

III. LEGAL ANALYSIS

1. Legal basis and regulatory status

This draft regulation constitutes an initiative of the Standing Committee on Earthquake-Resistant Standards in the use of the functions assigned to it in its foundational rule (Decree 3209/1974, of 30 August 1974) and the reorganisation of its composition (Royal Decree 518/1984, of 22 February 1984), and which is articulated by a proposal of the Ministry of Transport, Mobility and Urban Agenda, included in the Annual Regulatory Plan for 2022 and 2023

The draft respects the constitutional and legal limits of regulatory power.

The empowerment of competence is contained in the first Final Provision, and is carried out under the provisions of Article 149.1(13) of the Constitution, which confers on the State powers in matters of bases and coordination of the general planning of economic activity.

The legal basis and the normative status are adequate, in accordance with the criteria established by different judgements of the Constitutional Court. Thus, the Constitutional Court has ruled that the nature or basic aspects of a matter must be laid down in a law, but admits that 'exceptionally' they may be established by regulatory rules and even by executive acts (Constitutional Court Rulings 48/1988, 69/1988, 80/1988, 132/1992, 179/1992, 109/2003, 194/2004, 101/2005).

However, the Court notes that this exception must be construed as being limited by its nature as an 'exceptional exemption' of sufficiency of regulatory status (Constitutional Court Rulings 69/1988, 194/2004) and, in that regard, has stated that recourse to the regulation is justified only in certain cases:

- When it 'is an essential complement to ensure the lowest common denominator established in the basic legal standards' (such as, inter alia, Constitutional Court Rulings 25/1983, 32/1983 and 48/1988).
- 'Where, by reason of the nature of the matter, they are necessary to ensure the achievement of the objective in relation to the State's competence as regards the bases'.
- When the formal law is not the appropriate instrument to regulate exhaustively all the basic aspects of the matter due to the 'markedly technical character or the cyclical and changing nature' of the same (for all, Constitutional Court Ruling 131/1996).

In addition, it should be noted that the previous regulations of this draft were also adopted by Royal Decree; as an example, the last two precedents may be mentioned:

- Royal Decree 997/2002, of 27 September 2002, adopting the Earthquake-Resistant Construction Standard: General Part and Building (NCSE-02).
- Royal Decree 637/2007, of 18 May 2007, adopting the Earthquake-Resistant Construction Standard: Bridges (NCSP-07).

2. Relationship to other rules of national law.

Below is the national regulations that complement what is specified in this draft, or on which some of the aspects contained therein are based.

With regard to the project and execution of concrete, steel and mixed structures (concrete and steel), both building and civil engineering, the NCSR-23 standard is complemented and articulated with the provisions of Royal Decree 470/2021, of 29 June 2021, adopting the Structural Code.

In the area of building, the provisions of the NCSR-23 standard are complemented by the provisions of Royal Decree 314/2006, of 17 March 2006, which approves the Technical Building Code, as well as the provisions of Law 38/1999, of 5 November 1999, on Building Planning.

3. Relationship with other rules of European Union law

As indicated in the previous section, the NCSR-23 standard is articulated and complemented by the provisions of the Structural Code and the Technical Building Code. In this way, having configured the Structural Code as a technical framework consistent with that established in European regulations, this coherence also extends to this Earthquake-Resistant Construction Standard. This, in particular, as regards the placing on the market of products, by referring the Structural Code to Regulation (EU) 2019/515 of the European Parliament and of the Council of 19 March 2019 on the mutual recognition of goods lawfully marketed in another Member State (and repealing Regulation (EC) No 764/2008 and Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC); and also as regards the accreditation of entities as referred to in Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 laying down the requirements for accreditation and market surveillance relating to the marketing of products (and repealing Regulation (EEC) No 339/93).

4. Entry into force and effect

The standard is adopted indefinitely and is expected to enter into force on 1 July 2023, after adoption and publication in 'Official State Gazette' in June 2023.

However, according to the Single Transitional Provision, it is established that it will not apply in civil works to projects whose drafting or study order, in the field of public administrations, or commission, in other cases, had been carried out prior to the entry into force of this draft Royal Decree, as well as the works that are carried out in the development of the same, provided that they are initiated within a period of not more than two years from that entry into force, unless the competent public administration, or where appropriate, the promoter, agrees that it is mandatory.

Likewise, the Single Transitional Provision establishes that the standard not be mandatory in the field of building to projects that have requested municipal license of works or request it within nine months of the entry into force of this Royal Decree, applying in that case Royal Decree 997/2002, of 27 September 2002, adopting the Earthquake-Resistant Construction Standard: General Part and Building (NCSE-02). Such works must begin within the maximum period of effectiveness of the said licence, in accordance with its regulatory regulations, and, failing that, within a period not exceeding six months from the date of granting of the said licence. Otherwise, the projects must be adapted to the provisions of this Royal Decree.

5. Repeal of regulations

The entry into force of the proposed Royal Decree repeals Real Decree 997/2002, of 27 September 2002, adopting the Earthquake-Resistant Construction Standard: General Part and Building (NCSE-02), and Royal Decree 637/2007, of 18 May 2007, adopting the Earthquake-Resistant Construction Standard: Bridges (NCSP-07).

IV. ALIGNMENT OF THE STANDARD WITH THE ORDER FOR THE ALLOCATION OF RESPONSIBILITIES

Analysis of proficiency titles: identification of the prevalent title.

This Royal Decree is adopted pursuant to the provisions of Article 149.1(13) of the Constitution granting the State power regarding the principles and coordination of general economic planning.

As indicated in section III.1 of this report, the Constitutional Court has ruled in several judgements that the nature or the basic aspects must be established in a law, but admits that may 'exceptionally' be established by regulatory rules, as in the present case, due to the markedly technical nature of the rule.

Analysis of the participation of the Autonomous Communities and local governments in preparing the draft

The draft Royal Decree is fully in compliance with the competences of the Autonomous Communities.

On the other hand, during the preparation of the project no comments have been received from the Local Entities in the process of hearing and public information.

V. DESCRIPTION OF THE PROCEDURE.

1. Summary of the processing of the project carried out

The text of the draft of the earthquake-resistant Standard was drawn up according to the following procedures:

- At the request of the Undersecretary of Development, the Technical General Secretariat of the Ministry of Development (SGT) and the Directorate of the National Geographical Institute (IGN) agreed to create a working team to promote the updating of the earthquake-resistant regulations. This working group was made up of members of the Technical General Secretariat of the Ministry of Development (SGT) and the National Geographical Institute (IGN). Its main objectives were to analyse the updating of that legislation by adopting the corresponding parts of 'Eurocode 8: Project of earthquake-resistant structures' and their corresponding National Annexes through different techniques, including the referral technique, also examining the adaptation of the new or new versions of the normative project to the requirements derived from the principle of legal certainty and including its compatibility with the rest of the current regulations.
- The analysis and development of the work carried out by the work team led to the elaboration of a first draft of the Royal Decree of the Standard of Earthquake-Resistant Construction, related and effective, based on the transcription and adaptation to the current regulations of the different parts of Eurocode 8 and its National Annexes, with the ultimate aim of being able to have a text for study and discussion by the Standing Committee on Earthquake-Resistant Standards.
- Pursuant to the provisions of Article 25 of Law 50/1997, of 27 November 1997, of the Government, the project was initially included in the Annual Regulatory Plan for 2022 of the Ministry of Transport, Mobility and Urban Agenda.
- Pursuant to the provisions of Article 133 of Law 39/2015 and Article 26.2 of Law 50/1997, with the aim of improving the participation of citizens in the procedure of drafting standards, prior to the drafting of the regulation, a prior public consultation was carried out in the period from 1 to 31 March 2022, through the web portal of the Ministry of Transport Mobility and Urban Agenda. During this procedure comments were received, which are detailed in section 3.1 of this section and in Annex I to this document.
- After the study and analysis of the draft prepared by the work team, the Standing Committee on Earthquake-Resistant Standards provided

different proposals and corrections for some of its sections, for subsequent submission to the process of hearing and public information.

- The draft Earthquake-Resistant Construction Standard, NCSR-23 (named at that time NCSR-22) was submitted to the public hearing and information process, in compliance with the provisions of Article 26.6 of Law 50/1997, publishing the full text of the document on the web portal of the Ministry of Transport Mobility and Urban Agenda, from 8 to 29 July 2022, in order to obtain the reasoned comments deemed appropriate.
- During this procedure observations and comments were received from the different citizen contributions sent to the web portal by various entities, professional associations, individual citizens and also by other citizens grouped under some common interest. All these allegations and their replies, previously summarised and ordered, are detailed in section 3.2 of this section and in Annex II and the corresponding Appendices to this document. The allegations and corrections accepted in this process were incorporated into the normative texts and these submitted to the Standing Committee on Earthquake-Resistant Standards in September 2022.
- The Standing Committee on Earthquake-Resistant Standards, at its meeting of 21 March 2023, agreed to the final adoption of the Draft Earthquake-Resistant Construction Standard, NCSR-23, with the incorporation of the amendments resulting from the procedure for hearing and public information and other proposals discussed within the Commission at a previous meeting (15 February 2023) and finally accepted at this meeting.
- The Standing Committee on Earthquake-Resistant Standards is part of the Directorate-General of the National Geographical Institute, whose director holds the presidency and is composed of representatives of the Ministry of Transport, Mobility and Urban Agenda, representatives of the General Secretariat for Infrastructure, the General Secretariat for Transport and Mobility and the General Secretariat for Urban Agenda and Housing; by the members of the Ministerial Departments of the Interior; Defence; Science, Innovation and Universities; and Industry, Trade and Tourism; and by the members of the Nuclear Safety Council; the Spanish Commission of Geodesy and Geophysics; and the Spanish Association of Seismic Engineering, all related to the purposes of this Commission.

2. Summary of pending formalities

European public information (Directive (EU) 2015/1535 of the European Parliament and of the Council)

Report of the Office for Coordination and Regulatory Quality (Article 26.9 of Law 50/1997 and Article 2 of Royal Decree 1081/2017 of 29 December 2017)

Report of the Ministry of Territorial Policy (Article 26.5 of Law 50/1997)

Report of the Technical General Secretariat of the Ministry of Transport, Mobility and Urban Agenda (Article 26.5 of Law 50/1997)

Referral to the General Commission of Secretaries of State and Undersecretaries.

The final text of the draft Royal Decree will be submitted to the Council of Ministers for adoption, upon referral to the General Commission of Secretaries of State and Undersecretaries.

3. Handling comments and observations received during the public hearing procedures and information provided for in section 1.

3.1 Prior public consultation procedure provided for in Article 133 of Law 39/2015 of 1 October 2015 on the Common Administrative Procedure of Public Administrations and Article 26.2 of Law 50/1997 of 27 November 1997 on the Government.

In the mailbox made available for prior consultation, a total of 36 different emails were received, sent by individuals, associations and companies or other groups. These emails include various general comments and proposals for consideration in the preparation of NCSR-23.

The tables in Annex I contain an analysis of all these observations and comments, in some cases separated by points, indicating the entity or individual issuing the observation and the response or treatment adopted in each case.

3.2 Procedure for hearing and public information provided for in Article 26.6 of Law 50/1997 of 27 November on the Government

In the mailbox associated with the consultation of public information made available, through a web form on the pages of MITMA, a total of 23 contributions have been received from various entities such as, ICOG (Illustrious Official College of Geologists); IGME (Geological and Mining Institute of Spain), COGITISE (Official College of Industrial Technical Experts and Engineers of Seville); from professional associations such as, ACHE (Spanish Association of Structural Engineering), ACIES (Association of Consultants of Building Structures), ASECI (Association of Independent Consulting and

Engineering Companies), AICCPIC (Association of Engineers of Roads, Canals and Ports) and; individual citizens or also under a grouping of common interest.

Of the total number of proposals or comments, 26 have been fully accepted and 14 accepted in part. On the other hand, 27 of these entries have been considered as comments without concrete input and 101 comments have not been accepted, for which their non-inclusion has been justified.

The tables in Annex II contain a disaggregated and ordered summary of all these proposals, observations and comments, including, where appropriate, the section referred to, the entity or individual issuing the observation, and the treatment adopted.

The comments not accepted include five submissions expressing repeated comments opposing the general approach of the draft legislation in the terms presented. Replies and justification for non-acceptance of the latter have been grouped together in Appendix A.

Appendix B contains the most extensive replies adopted for the submissions of Rosario Cornejo Arribas and Álvaro Parrilla Alcaide, members, incumbent and alternate, of the Standing Committee on Earthquake-Resistant Standards, representing the General Secretariat of Infrastructure of MITMA.

VI. IMPACT ANALYSIS

1. Economic impact

In relation to the economic impact that the implementation of the new Earthquake-Resistant Construction Standard based on the Eurocode-8 may have, compared to the rules currently in force (NCSE-02 and NCSP-07; and therefore, as regards only buildings and bridges), a specific study was carried out. This study was commissioned at an early stage of the draft Royal Decree and is therefore based on Parts 1 and 2 of Eurocode 8.

From this study, which is set out in Annex III to this report, the following conclusions are drawn:

Buildings

The study identified five relevant differences between the Spanish standard NCSE-02 and the European standard EN 1998-1, from the point of view of its possible economic impact, namely:

- a) differentiation between primary and secondary earthquake-resistant elements
- b) the conditions imposed to satisfy the requirements of global ductility
- c) the percentage of columns that must meet overall ductility requirements
- d) the value of the force-reducing factor
- e) the masses to consider in seismic calculation.

For the assessment, a prototype of a conventional housing building in Spain has been defined, of six storeys high with two houses of about 110 m² built per floor. The total constructed area is approximately $250 \times 6 = 1\,500$ m². The structure of the building was addressed using one of the most widely used systems in our country: the reinforced concrete rigid knot porticoes. The structure was sized separately by applying the Spanish standard NCSE-02 and applying the European standard EN 1998-1, in both cases for the same level of seismic hazard. The building was taken as being located in the most seismic area of Spain (Granada).

In the results obtained, it has been observed that the five factors identified represent a reduction in kilos of steel and in cubic meters of concrete when the European standard EN 1998-1 is used in comparison with the quantities obtained with the Spanish standard NCSE-02. The combined effect of the five most relevant differentiating factors identified can be quantified and results in savings of approximately EUR 19.2/m² built of building. Considering an approximate price of reinforced concrete porticoed structure with unidirectional in situ forging of edge 25 + 5 cm of about EUR 75/m², the savings resulting from

the application of EN1998-1 compared to the NCSE-02 in the studied building is of the order of 25 %.

These differences will be reduced in buildings located in less seismic areas, reaching cancellation in buildings located in less seismic areas where gravitational loads (and not seismic ones) govern the dimensioning of the structure. However, it is important to note that based on the five relevant differences identified between the Spanish standard NCSE-02 and the European standard EN 1998-1 from the point of view of its possible economic impact, the application of the Eurocode EN 1998-1 always results in economic savings.

Bridges

The study made it possible to reveal the differences between NCSP-07 in force in Spain and EN1998-2. For this, four representative examples of road and railway bridges have been considered and these bridges have been placed in high seismic conditions (for the expected levels in Spain), but not maximum, and in medium terrain conditions.

For the bridges analysed it has been concluded that in some cases seismic solicitation governs the design while in others it is not. But in all the cases analysed, the economic consequences of applying European legislation would be null and void. This does not mean that the two regulations are identical. This study has been responsible for highlighting the existing differences. The lack of economic consequences is actually due to the low seismicity that occurs in Spain.

It is also possible that examples with a greater sensitivity to seismic actions can be found, but these isolated examples cannot be considered representative of the whole of the bridges that are built in Spain. A singular bridge by its static scheme or simply because of its dimensions (light and height) can generate very important seismic efforts and the differences between the two standards may become relevant in this particular case. But the fact that these differences can occur in a specific case cannot be considered relevant depending on the study that has been carried out.

This conclusion was entirely expected as the Spanish standard was made on the basis of the Eurocode introducing only small changes. On the other hand, the drafting of the National Annexes has been carried out in many cases by maintaining some of the criteria with which NCSP-07 was drafted. As a result, these are very similar and probably interchangeable regulations. The National Annex introduces in many cases improvements that are due to the progress of knowledge about the seismic behaviour of structures and about seismicity and its consequences in Spain. Therefore, the application of the Eurocode will have negligible economic consequences and possible differences will only improve the security of our structures.

2. Budgetary impact

The draft Royal Decree adopting the Earthquake-Resistant Construction Standard NCSR-23 does not imply any budgetary impact, because its application will not imply an increase in public expenditure or decrease in public revenues, so it does not affect the budgets of the State Administration or those of other Territorial Administrations, given the nature of the measures established in it.

3. Identification and measurement of administrative burdens

As regards the possible generation of administrative burdens, understood as those activities of an administrative nature that must be carried out by the subjects obliged to comply with the obligations introduced in the regulations, no new burdens imposed by this Royal Decree have been identified, so it is not necessary to quantify them according to the Simplified Method for the Measurement of Administrative Burdens.

4. Gender impact

According to Article 19 of Organic Law 3/2007, of 22 March 2007, for the effective equality of women and men, as well as Article 26.3(f) of Law 50/1997, of 27 November 1997, on the Government, the gender impact of the project has been subject to evaluation.

This draft is based on a situation in which there are no unequal opportunities or treatment between men and women, and no change in this situation is anticipated, meaning it can be stated that the provisions contained in the Royal Decree do not contain any aspect from which negative consequences or discrimination may arise and that it does not contain provisions related to gender.

It can therefore be concluded that this standard has no gender impact.

5. Impact on the family

Pursuant to the provisions of the tenth additional provision of Law 40/2003, of 18 November 2003, on the protection of large families, introduced by the fifth final provision of Law 26/2015, of 28 July 2015, amending the system of protection of children and adolescents, the draft legislation has no impact on the family, because it exclusively addresses technical issues and does not have direct legal effects on natural persons.

6. Impact on children and adolescents

Pursuant to the provisions of Article 22(d) of Organic Law 1/1996 of 15 January 1996 on the Legal Protection of Minors, the partial amendment of the Civil Code and the Civil Procedure Act, as amended by Law 26/2015 of 28 July 2015 amending the system for the protection of children and adolescents, the draft

legislation has no impact on children and adolescents, because it addresses technical issues and does not have direct legal effects on natural persons.

7. Climate change impact

With regard to mitigation and adaptation to climate change, this Royal Decree does not regulate aspects related to the manufacturing processes and sustainability of construction materials. However, NCSR-23 is coordinated through the Structural Code, which generally incorporates the latest technological innovations in the sector. In this sense, it is estimated that the overall efficiency and optimisation of the materials used will be higher than that achieved by the regulations currently in force. In addition, NCSR-23 alone will contribute to these objectives by increasing the strength and useful life of structures in seismic areas.

8. Other impacts

Impact due to opportunities, non-discrimination and universal accessibility for people with disabilities

Based on the provisions of the Consolidated Text of the General Law on the Rights of Persons with Disabilities and Their Social Inclusion, adopted by Royal Legislative Decree 1/2013 of 29 November 2013, this draft does not imply, in substance or form, impact on account of opportunities, non-discrimination and universal accessibility of persons with disabilities.

Social and environmental impacts.

The prevention of specific environmental impacts that may be generated during the construction works, as well as the correction or compensation mechanisms are not the subject of this Royal Decree, but of the corresponding environmental legislation.

VII. EX-POST EVALUATION.

As set out in the Annual Regulatory Plan for 2022, the ex-post evaluation provided for in Article 28.2 of Law 50/1997 and Articles 2.5 and 3.2 of Royal Decree 286/2017 of 24 March 2017 is not anticipated in this standard, which regulates the Annual Regulatory Plan and the Annual Report of Regulatory Evaluation of the General Administration of the State and establishes the Regulatory Planning and Evaluation Board.

**DRAFT ROYAL DECREE ADOPTING THE
EARTHQUAKE-RESISTANT CONSTRUCTION
STANDARD NCSR-23**

REGULATORY IMPACT ANALYSIS REPORT

ANNEX I

**HANDLING OF COMMENTS AND COMMENTS RECEIVED
DURING THE PRIOR PUBLIC CONSULTATION PROCESS**

Introduction

The following table contains an analysis of all the observations and comments received in the process of prior consultation, indicating the entity or individual that issues the observation and the response or treatment adopted in each case.

Note. At the time of submitting the draft to prior consultation, this Earthquake-Resistant Construction Standard was known as NCSR-22, meaning the comments and comments received refer to that name.

Entity	Contributions/Remarks	Response
Josep Ma Esteve Muñoz	I would simply consider directly applying Eurocode 8 of Earthquake-Resistant Structure Projects to unify criteria	The draft NCSR-23 fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force in Spain.
Luis González Torquemada	We propose copying UNE EN 1998 + AN UNE in 1998 and integrating it into the Structural Code itself.	The draft NCSR-23 fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force.
Jose Javier Portales Serrano	<ul style="list-style-type: none"> - I believe that the new Spanish Earthquake-Resistant standard should have a specific section for prefabricated buildings, in which recommendations for unions are given for these elements in both industrial and residential buildings. - A good starting point can be the FIB BULLETIN No 27 'Seismic design of precast concrete building structures' - Since the Bulletin exceeds the size limit, I recommend that you look for it or request it. 	The draft NCSR-23 fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force and therefore includes, like Eurocode-8, various aspects of prefabricated construction of concrete structures in section 5.11 of Annex 1 – General rules, seismic actions and rules for construction
Rocío Mora Gragera	We suggest that the new seismicity map held by the cartographic institute be used for the calculation of the earthquake.	The draft NCSR-23 Standard will use as hazard data for the calculation of seismic action, data based on the seismic hazard map of Spain developed by the National Geographical Institute in 2013 and 2015 and adopted in the National Annex of the Eurocode 8
Alejandro López Vidal	<p>It is proposed:</p> <ul style="list-style-type: none"> - — At least, updating the seismic map in the NCSE-02 to the latest version (2015) - — Taking into account the technological progress, for example, in the case of prefabricated concrete structures that are considered as reacting poorly to earthquakes, unless technical justification expresses that it improves them. To this end, 	<ul style="list-style-type: none"> - The draft NCSR-23 Standard will be used as hazard data for the calculation of seismic action, data based on the seismic hazard map of Spain developed by the National Geographical Institute in 2013 and 2015 and adopted in the National Annex of the Eurocode 8 - The NCSR-23 project includes, like the Eurocode-8, various aspects of prefabricated construction of concrete structures in

	several European projects have been carried out since 2000 that demonstrate this, through a study of the connections.	section 5.11 of Annex 1 – General rules, seismic actions and rules for building.
Alejandro Castillo Linares	1. It would be appropriate to apply directly to the Eurocode EN 1998. 2.	The draft NCSR-23 standard fully adopts Eurocode 8 (UNE-EN 1998), by transcribing it and adapting it to the specific regulations in force in Spain.
Carlos Manuel Fernández Fernández	It is proposed: -Making the proposed National Annex of Eurocode 8 final. -Ensuring compliance with the 2015 seismic hazard map of the IGN. -That the future NCSR-22 actually consists of the implementation of the Eurocode 8 with our national annex, which would be compatible with the current Structural Code. -Published in the Official State Gazette and brought into force as soon as possible.	The draft NCSR-23 standard resolves the issues or petitions raised: - The Eurocode 8 National Annex was adopted and is fully integrated into the new NCSR-23. - NCSR-23 takes as hazard data those based on the 2015 IGN hazard map and adopted in the National Annex. - The NCSR-23 fully adopts Eurocode 8, (including its National Annex) by transcribing it and adapting it to the specific regulations in force in Spain - The NCSR-23 will be published in full in the Official State Gazette
- Alberto Fraile de Lerma - Jaime Dominguez Abascal - Javier Estévez Cimadevilla - Alejandro Bernabeu - Laureà Miró Bretos - Salvador Ivorra Chorro - Salvador Monleón Cremades - Elena Olivier	Having been made aware of the public consultation being conducted by MITMA on the draft Royal Decree for the Earthquake-Resistant Construction Standard NCSR-22, I would like to state the following in relation to the objectives of the standard: 1 The preparation of a new Spanish Earthquake-Resistant Standard through reproduction of Eurocode 8 replacing references to other Eurocodes with references to Spanish structural codes results in the mixture of regulatory bodies of different origin, thus breaking technical coherence and can lead to situations that compromise security. 2 Therefore, European seismic legislation (Eurocode 8, UNE-EN-1998) should be adopted by direct reference in its entirety, without changes or replacements of references to other Eurocodes by references to national regulations. The 'direct referral' technique adopted in other European countries to incorporate Eurocodes into their national legislation is the only	See response in Appendix A

<p>Sanz</p> <ul style="list-style-type: none"> - Francisco López Almansa - Xavier Goula Suriñach - Beatriz Gil Rodríguez - Luis G. Pujades Benoit - Cesc Aldabó 	<p>way to ensure the internal coherence of the set of rules applied, as well as harmonisation with Europe.</p> <p>3 It is vital that the NCSR-22 Earthquake-Resistant Construction Standard incorporates an automatic update clause so that as soon as UNE publishes the second generation of Eurocodes and their corresponding National Annexes are available, the second generation of Eurocode 8 enters immediately into force.</p>	
<p>José María Goicolea</p> <p>Francisco Arriaga</p> <p>Martitegui Beatriz</p> <p>González Rodrigo</p> <p><u>Signed by:</u></p> <p>Hugo Corres</p> <p>Peiretti</p> <p>Miguel</p> <p>Fernández Ruiz</p> <p>Ivan Muñoz</p> <p>Díaz</p> <p>Miguel Angel</p> <p>Astiz Suárez</p> <p>Alejandro Pérez</p> <p>Caldentey</p> <p>Juan Carlos</p>	<p>1 The preparation of a new Spanish Earthquake-Resistant Standard through reproduction of Eurocode 8 replacing references to other Eurocodes with references to Spanish structural codes results in the mixture of regulatory bodies of different origin, thus breaking technical coherence and can lead to situations that compromise security.</p> <p>2 Therefore, European seismic legislation (Eurocode 8, UNE-EN-1998) should be adopted by direct reference in its entirety, without changes or replacements of references to other Eurocodes by references to national regulations. The 'direct referral' technique adopted in other European countries to incorporate Eurocodes into their national legislation is the only way to ensure the internal consistency of the set of rules applied, as well as harmonisation with Europe.</p> <p>3 It is vital that the NCSR-22 Earthquake-Resistant Construction Standard incorporates an automatic update clause so that as soon as UNE publishes the second generation of Eurocodes and their corresponding National Annexes are available, the second generation of Eurocode 8 enters immediately into force.</p> <p>4 The training and skills of structural engineering professionals must be focused on European criteria and regulations, meaning that as part of our teaching, the reference regulations are the Structural Eurocodes.</p>	<p>See response in Appendix A</p>

<p>Mosquera Feijóo Javier Pascual Santos Carlos Zanuy Sánchez José María Arrieta Torrealba Miguel Ortega Cornejo Alvaro Serrano Corral Luis Matute Rubio</p>		
<p>Miguel Esteban Herrero</p>	<p>:</p> <p>1 European seismic legislation (Eurocode 8, UNE-EN-1998) should be adopted by direct referral in its entirety, without changes or replacements of references. The rest of the countries assume the standard by direct reference, in order to incorporate the Eurocodes into their national legislation. This is the only way to ensure internal regulatory coherence and harmonisation with Europe.</p> <p>2 The Earthquake-Resistant Construction Standard NCSR-22 must incorporate an automatic update clause so that as soon as UNE publishes the second generation of Eurocodes and their corresponding National Annexes are available, the second generation of the Eurocode 8 enters into force immediately.</p>	<p>See response in Appendix A</p>
<p>José Estaire Gepp</p>	<p>1 I believe it is a completely incorrect regulatory practice to partially reproduce another standard (in this case Eurocode 8), meaning this entails minor technical changes and the elimination of cross-references to other documents (in this case, the overall package of Eurocodes).</p> <p>2 It also makes no sense that the future Spanish seismic standard</p>	<p>See response in Appendix A</p> <p>Regarding the geotechnical field, the requirements contained in Annex 5 of the NCSR-23, are complementary to the specific</p>

	<p>be based on the current Eurocode 8 when in about two to three years the Second Generation of Eurocodes will be issued by CEN, with important technical improvements compared to the version currently in force.</p> <p>3 In the geotechnical field, in which I work professionally, the adoption of the complete package of Eurocodes also allows Geotechnical Engineering to have a single regulatory document of reference to the current situation in Spain in which three different documents coexist, for three different areas of action, which induces additional risks in the level of security of the projects.</p> <p>4 If the complete package of Eurocodes, Part 5 of Eurocode 8, concerning geotechnical aspects, is not adopted, it cannot be applied as it is not possible to refer to any Spanish legislation in force.</p>	<p>regulations and regulations that result from application in the geotechnical project in the absence of seismic loads. In the absence of specific regulation and, in the area of Eurocodes some sections of UNE-EN 1997 are considered in the text for reference and consultation.</p>
Amadeo Benavent Climent	<p>Requests that:</p> <ol style="list-style-type: none"> 1. European seismic legislation (Eurocode 8, UNE-EN-1998) is adopted by direct reference in its entirety, without changes or substitutions of references to other Eurocodes by references to national regulations. 2. That the NCSR-22 Earthquake-Resistant Construction Standard incorporates an automatic update clause so that as soon as UNE publishes the second generation of Eurocodes and their corresponding National Annexes are available, the second generation of the Eurocode 8 immediately enter into force. 	See response in Appendix A
Álvaro Parrilla Alcaide	<p>- It is understood that the only viable way to undertake the updating of the earthquake-resistant regulations in Spain is the same that is carried out in the vast majority of countries in Europe: the REGULATION BY DIRECT REFERRAL TO EUROCODE 8.</p>	See response in Appendix A
Peter Tanner	The European regulation for the sizing of earthquake-resistant	See response in Appendix A

	structures, Eurocode 8, must be adopted in its entirety, keeping all its references to other Eurocodes unchanged or not replaced as these form a consistent set of rules regarding the treatment of uncertainties and structural reliability.	
Spanish Association of Engineering, Consulting and Technical Service Companies (TECNIBERIA)	An alternative is proposed to achieve the objectives of the draft subject to consultation, i.e. updating the standards NCSE-02 and NCSP-07 with the extension to new types of structures, within the harmonised framework of the Eurocode 8 UNE-EN-1998. This alternative consists of the establishment of the Eurocode 8 UNE-EN-1998, with the corresponding national implementation documents and the map of seismic hazard of the National Geographical Institute, as a mandatory reference standard for construction works in Spain.	See response in Appendix A
Assoc. of Structural Building Consultants (ACIES)	<p>REQUESTS:</p> <p>FIRST: The adoption of European seismic legislation (Eurocode 8, UNE-EN-1998) by direct reference in its entirety, without changes or substitutions of references to other Eurocodes by references to national regulations.</p> <p>SECOND: That an automatic update clause is incorporated within the Earthquake-Resistant Construction Standard NCSR-22 so that when UNE publishes the second generation of Eurocodes, which is currently in its final stage of voting procedures in Europe, and its corresponding National Annexes are available, the second generation of Eurocode 8 immediately enter into force.</p> <p>THIRD: That a transitional period of 36 months be established from the entry into force of the Royal Decree, for compliance with the document.</p>	<p>See response in Appendix A</p> <p>As regards the requested transitional period of 36 months from the entry into force of the Royal Decree, it is too long for the objectives of this draft regulation, which states that, <i>'The provisions of this Royal Decree will not apply to projects whose drafting or study order, in the field of public administrations, or commission, in other cases, had been carried out prior to the entry into force of this Royal Decree, as well as to the works that are carried out in the development of the same, provided that they are initiated within a period of no more than two years from that entry into force (...)</i></p>
Assoc. of Structural Engineering (ACHE).	<ul style="list-style-type: none"> - ACHE considers that with regard to the structural project the new NCSR-22 standard should not reproduce Eurocode 8 but should refer in full to UNE EN-1998 and its national annex, respecting all the references included in that standard, so that its 	See response in Appendix A

	<p>application is combined with the rest of Eurocodes, which form a comprehensive and harmonised regulatory framework.</p> <p>-</p>	
MC2 Estudio de Ing.S.L.U.	<p>It is considered that the only way to establish a regulatory framework 'coherent and harmonised' with European regulations is the updating of the Earthquake-Resistant Construction Standard NCSR-22 by direct reference to Eurocode 8 including the normative references to the rest of the Compendium of Structural Eurocodes, word for word. In this regard, it should be noted that the direct referral technique has been considered a valid procedure for technical regulation by the Council of State in its Opinion No 1083/2019, issued on 23 January 2020. Also, the Eurocode 8 can be used directly fully in Spain, because its National Annex is published and also includes the most up-to-date version of the map of seismic hazards of Spain, which takes into account the latest seismic events that have occurred in the Iberian Peninsula, which guarantees the application of the most advanced knowledge available for the project and construction of structures in Spain.</p> <p>- Finally, the wording of the NCSR-22 by direct reference to Eurocode 8, will also allow its automatic updating (once adopted its National Annex), making it possible to maintain a completely updated technical regulation that contains the most advanced knowledge of the technique at all times and with a complete consensus at a European level.</p>	See response in Appendix A
IDEAM S.A.	<p>The constitution of a '<i>coherent and harmonised technical framework</i>', objective of the new standard, such as that established in the European technical regulations, involves the drafting of the NCSR-22 by referring (and not copying or adapting) to Eurocode 8, without making any editing in its multiple references to other Eurocodes. This alternative, which is not (surprisingly) included in point 5 ('<i>Possible Alternative, Regulatory and Non-Regulatory Solutions</i>') of the public consultation, would allow, in addition to resolving all the issues raised above, to have an automatically</p>	See response in Appendix A

	<p>updated standard once the new generation of Eurocode 8 is published and its National Annex is adopted, being at all times completely updated on the safety and seismic performance of the structures. Any other alternative will simply perpetuate the mistakes of the past, taking risks that cannot be assumed from the point of view of structural security in the face of the quake.</p>	
Belén Orta Rial	<ol style="list-style-type: none"> 1 In my opinion, I believe that Spanish legislation is necessary, which provides for its own construction systems rather than adopting the more generic EC-8. The EC-8 does not contemplate construction aspects typical of the Spanish construction such as the forging of beams and hollow bricks or flat beams. 2 I understand that it is necessary to update the earthquake-resistant construction regulations to reflect the progress of recent years, to include, as far as possible, the behaviour of non-structural elements, including flaps. 3 Starting with the seismic map, I believe that the new NCSR-22 should continue to contemplate distant earthquakes, similar to the current NCSE-2002 with the K coefficient affecting towns and cities in south-western Spain. This aspect is not covered by EC-08. Some Central American regulations contemplate nearby earthquakes, such as the one that occurred in Lorca, so it would be convenient to include it in the new Spanish regulations. 4 The new legislation should include energy dissipation systems: sinks or seismic insulators. In this sense, the new regulation could include performance-based design and energy balancing methods. 5 Consideration should also be given to buildings that may have a basement, an aspect that is not considered in the usual bibliography. 6 The current NCSE-02 contains construction solutions for joints between structural elements that are very useful and that are not contemplated in the EC-8 and it would be desirable for the Spanish legislation to include these aspects, although updated 	<ol style="list-style-type: none"> 1- The provisions of section 10 of Annex 19 to the Structural Code, supplemented, where appropriate, with the corresponding provisions of CNSR-23 set out in section 5.11 of Annex 1, for prefabricated parts, will be generally considered as regards the forgings of beams and bolts. The requirements to fulfil the function of diaphragm versus seismic action (sections 4.2.1.5, 5.10 and 5.11.3.5 of Annex 1 of NCSR-23) will be considered in particular. With regard to flat beams, the draft Standard NCSR-23 adopts the provisions in this regard in the National Annex to EC-8, inserted in section 5.1.1(2) of Annex 1 to NCSR-23. 2- The draft NCSR-23 provides, in the same way as Eurocode 8, for the earthquake-resistant design of non-structural elements (see section 4.3.5 of Annex 1). 3- The draft NCSR-23 provides, like its predecessor NCSE-02, for the use of a contribution coefficient K to take into account the influence of distant seismic activity (see section 3.2.1 of Annex 1). This coefficient is the same as is also prescribed in the Eurocode 8 National Annex. 4- The draft NCSR-23 standard fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force in Spain. 5- Obviously the standard does not restrict its scope to buildings without underground. It is the responsibility of the designer to analyse the structure as a whole, considering, where appropriate, in structural modelling the substructure below the ground level, taking into account in an appropriate way the restrictions and actions induced by it. 6- It is not the aim of this regulation to provide construction details. The draft NCSR-23 standard fully adopts Eurocode 8, by

	<p>as necessary.</p> <p>7 As for obtaining the period of the structure, all the codes include a simplified formulation, whereas standard practice at present is to introduce the structure in a calculation programme that already provides the period. Since the complete building is not introduced (without enclosures, partitions, etc.) the period obtained is higher and therefore the seismic action is usually lower. It would be advisable that the new regulations include some type of correction for using programmes when the difference between the estimated period and that obtained by the programme with an incomplete building exceeds a certain margin.</p> <p>8 Current ductility coefficients are difficult to apply when the building has different configuration in the two directions considered, for example with hanging beams only in one direction.</p> <p>9 I suggest that the new regulation contemplate that the breaking mechanism of the reinforced concrete porches, the positive and negative bending moment knuckles in the beams are not in the same position as is intended to be expressed with the following image, because the seismic action must be combined with the gravitational and is usually a very common error in the bibliography:</p>	<p>transcribing it and adapting it to the specific regulations in force in Spain.</p> <p>This does not prevent the designer from using the complementary bibliography or construction details that they deem appropriate, provided that they comply with the current regulatory requirements.</p> <p>7- Indeed, this is a critical issue: fillers, stools and enclosures, among others, will be included in the modelling of the structure when they cannot be properly separated from it (see section 4.2.2(3) of Annex 1 of NCSR-23).</p> <p>8- According to 4.3.3.5.1(4) of Annex 1 of draft NCSR-23: 'If the structural system or the classification of regularity in height of the building is different in the different horizontal directions, the value of the coefficient of performance, q, may also be different.'</p> <p>9- Indeed, in porticoes where the beams receive gravitational loads of consideration, knuckles with rotation in one direction could be generated within the vain of the beam. Of course, this must be kept in mind by the designer when sizing and assembling these elements. Where appropriate, the provisions of 5.5.3.1.3(1) of Annex 1 will be applied, considering as a critical section, in addition to the ends (which must always be), any other section of the vain of the beam when it is susceptible to plastification in the seismic calculation situation.</p>
Jose Luis de Miguel Rodríguez	<p>Demand for proposals for the seismic standard.</p> <p>1 For the values corresponding to each site, the first standards had an analogue map, with zones, where acceleration grew geometrically. The borders were blurry, and with great significance because when crossing them, the acceleration doubled, and in some it meant you went from not applying earthquake circumstances to applying them with a great acceleration. The change to the current system of list of municipalities, with values in hundredths of g., largely eliminated the previous dysfunction. When opting for a digital map, not</p>	<p>1- The draft NCSR-23 standard establishes a classification of the national territory by means of a grid of points, for which the reference values of seismic hazard parameters are given. The parameters for a given point are obtained by interpolation in accordance with section 3.2.1(2) of Annex 1.</p> <p>2- The draft NCSR-23 provides, like its predecessor NCSE-02, for the use of a contribution coefficient K to take into account the influence of distant seismic activity (see section 3.2.1 of Annex 1). This coefficient is the same as is also prescribed in the Eurocode 8 National Annex.</p>

	<p>overacting is recommended. With the values (in hundredths of g) in a reference grid, every few kilometres, and the rule of taking the worst of the four of the grid into which any point of the work falls, may be more than enough. The system generating a different value in each construction coordinate is undesirable.</p> <p>2 It is advisable that, either through map or spectrum value, the possibility of earthquakes originating from the Azores-Gibraltar fault, which arrive with a very long period, should be considered. This affects the south-west of Spain and Portugal. Some documents, such as the Eurocode, do not foresee this.</p> <p>3 To obtain oscillation periods for architectural works, it would be useful to specify very clearly, with which description of the construction and method of analysis can be given valid the period obtained by this procedure. In any case, it would be desirable to establish what is done if there is a significant difference with that of the simple expressions provided by the standard, and especially if these differences are on the insecure side. Usually, with imperfect models, which do not consider the totality of the construction, much longer periods are obtained and therefore much smaller seismic actions.</p> <p>4 If reduction coefficients are established by performance or ductility, it should be specified how that variable is considered when the category to obtain its value is not uniform. It is perfectly possible that it has forged in one direction, and in the other, hanging beams have a different ductility assignment. And this exists even when changing direction from one point to another on the same floor. Or that there are walls or screens only in one direction, or that in one floor there are slabs with or without beams, and in the other unidirectional forgings. Needless to say, if categories are established by the materials involved, they must provide for constructions, for example, with steel supports and concrete forgings, a very common solution.</p>	<p>3- The draft of Standard NCSR-23 outlines the need for appropriate modelling of the structure (see points 2.2.4.1(4), 4.2.2(3), 4.3.1(2) and 4.3.1 (8) of Annex 1). The influence of structural and non-structural elements that may influence the response of the structure must be considered in the modelling of the structure.</p> <p>For the expressions for the calculation of the fundamental period, T_1, to be used in the equivalent lateral force method (see section 4.3.3.2.2. of Annex 1), the same criteria should be understood as applying.</p> <p>4- The casuistry would be infinite. It is a decision of the project to select the most appropriate behavioural coefficient (and, consequently, of the seismic action), depending on the ductility and the dissipation capacity that the structure can effectively develop, considering the materials, the structural configuration, the control of the potential fault mechanisms, the adequate detailed of the critical regions, etc. The behaviour coefficient may be adopted differently in each direction of analysis.</p> <p>In any case, the designer should not lose sight of the fact that the earthquake-resistant design is not limited only to the definition of seismic action and to the analysis for such action of a given structure (projected a priori without earthquake-resistant criteria). The entire design process must be treated in a comprehensive and coherent way from the first stages of the project, which affects in a very special way the initial choice of an adequate structuring of the primary earthquake-resistant system.</p> <p>5- The draft NCSR-23 standard contemplates, in the same way as Eurocode 8, the treatment of 'short pillars'. These types of elements are susceptible to failure from fragile to sharp, for which the design by capacity is imposed (see 5.2.3.3 and 5.4.2.3 of Annex 1 of NCSR-23). In addition, the particular case of the short pillars generated by coercion due to brick fillings is dealt with in section 5.9(2) of that Annex 1. However, it is a good practice to try to avoid as much as possible such configurations in the conception of an earthquake-resistant design.</p> <p>6- The draft Standard NCSR-23 prevents against this type of</p>
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	<p>5 A pending matter of the previous standard is that of 'short columns'. All that was said was the vagueness that they induce increases in solicitation that are not well established, and a sharp decrease in ductility, and that one must be especially cautious. The short column failures in Lorca were responsible for many injuries, particularly the collapse of the only construction that eventually collapsed. Prevention of 'hijacked supports' by factories would be advisable, with a similar effect.</p> <p>6 Another more troubled issue is the 'ground level' or 'soft' or 'weak' floor. All that the current standard indicates is that, if that is the case, seismic stresses are concentrated on that floor in a way that is more difficult to calculate, so greater prudence and safety is advisable, without going further. With a weak floor, the assumption is reached on which the established procedures are based, that plastic knuckles are formed that are distributed throughout the construction. The issue is less manageable, especially since the calculation programs to use do not allow to declare in the data entry what the building is really like. And in Lorca almost all the injuries that were not by small columns, were on the diaphanous ground floor. The matter is difficult to regulate, because, as happened in Lorca, there can be transparency without having been able to foresee it in the project, since they were premises for sale, which had not been occupied for some time.</p> <p>7 On the subject of loads of supports on a beam, which the technical literature highlights as a problem to be monitored, the current standard is limited to establishing that, with vertical seismic movement, the check of cutter without reduction by ductility is performed. However in Spain, considering the worst combination of variables, the set of safety coefficients involved leads to the worst situation being that of ordinary gravitational load without earthquake, so the aforementioned prevention strikes. And in fact in the standard it indicates that in building it is not necessary to consider vertical seismic action even when</p>	<p>configuration (see 4.4.2.3 (3) in Annex 1). However, the structure must always be properly analysed, considering, where appropriate, in structural modelling the brick fillings, enclosures and partitions, which could act as structural elements, considering their rigidities properly. With regard to the last section, the existence or not of a 'soft floor' should not depend on the actions or interventions that are made (or not) after the delivery of the work. To prevent this and other situations of such a nature, see the express prohibitions taken from the National Annex and inserted in section 4.2.2(3).</p> <p>7- The draft Standard NCSR-23 allows, under certain conditions, the existence of beams on which isolated pillars rest (see 5.4.1.2.5(2) in Annex 1). However, in areas of high seismicity it is a good practice to give continuity to each vertical earthquake-resistant element below each top slab, so that the seismic loads find a clear and direct path to foundation.</p> <p>8- The philosophy of 'strong pillar, weak beam' is taken into account in the draft NCSR-23 Standard by considering that the sum of resistant moments that pillars reach a knot must be 1.3 times greater than the sum of those corresponding to the beams reaching said knot (see point (4) of section 4.4.2.3 of Annex 1).</p> <p>9- The NCSR-23 Standard project allows for different possibilities of analysis, both linear (spectral modal analysis or equivalent lateral force method) and non-linear (pushover analysis or analysis in the time domain). However, the use of spectral modal analysis is preferred (see 4.3.3.1(2) in Annex 1). In this case, for the determination of the calculation spectrum, the most appropriate behaviour coefficient (q) may be adopted, depending on the ductility and the dissipation capacity that the structure can actually develop. In any case, it is essential to apply all the design criteria imposed by the Standard.</p> <p>10- In accordance with section 4.3.5.1(1) of Annex 1 of draft Standard NCSR-23, non-structural elements which, in the event of failure, may cause damage to persons or affect the main structure of the building or critical services and facilities must be capable of resisting seismic design action.</p>
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	<p>there are off loads. it would be necessary to clarify the matter.</p> <p>8 A topic of seismic checking is that knots resist more than parts, supports more than beams, and cut more than bending. In other cases it is summarised in the principle of 'strong pillar, weak beam'. Translating that into a code is not easy, and the simple reference to different safety coefficients does not lead to what is intended, because by definition, each check is done with the consideration of 'equal or greater', and if the case of 'greater', it does not necessarily produce the intended effect.</p> <p>9 The assertion of the current standard, although it is only explicit in steel, that if you want to do linear analysis, you have to give up the reduction by ductility, it makes sense, but it is very drastic. There is a need to clarify something about this issue, because without applying ductility, the solution will be difficult to competitive. And the plastic calculation is poorly implemented.</p> <p>10 Last but not least, for example in Lorca, most of the personal injuries were due to the fall of factories, case of flaps, of which there are still no seismic calculation criteria, (period, ductility, acceleration), although there is already verification, although they give rise to surprising results. The rules on this issue should include those of caution, for example, of canopies in portals, which is the most dangerous point.</p>	
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**DRAFT ROYAL DECREE ADOPTING THE
EARTHQUAKE-RESISTANT CONSTRUCTION
STANDARD NCSR-23**

REGULATORY IMPACT ANALYSIS REPORT

ANNEX II

**HANDLING COMMENTS AND COMMENTS RECEIVED DURING
THE HEARING AND PUBLIC INFORMATION**

Introduction

The following table contains a summary and disaggregated analysis of all the proposals, observations and comments received in the process of hearing and public information, including, where appropriate, the section to which they refer, the entity or individual issuing the observation, and the treatment adopted.

Note. At the time of submitting the draft to prior consultation, this Earthquake-Resistant Construction Standard was known as NCSR-22, meaning the comments and comments received refer to that name.

Article	Entity	Contributions/Remarks	Accep.	Response
Annex 1 1.1.1	Manuel Damián Martín López	<p>Where it says:</p> <ul style="list-style-type: none"> - The Earthquake-Resistant Standard applies to the project and construction of buildings and civil engineering works in seismic regions <p>It should say:</p> <ul style="list-style-type: none"> - The Earthquake-Resistant Standard applies to the project and construction of buildings, civil engineering works and engineering works of the industrial branch in seismic regions. 	NO	<p>The current wording is considered to be sufficiently clear, with 'civil engineering' covering all engineering works that fall within the scope of this standard. Article 2 of the draft Royal Decree adopting NCSR-23 specifies that scope.</p> <p>On the other hand, not all engineering works in the industrial sector are covered by NCSR-23. The industries generically include not only civil engineering works, but also mechanical engineering and electrical engineering works, among others. For example, NCSR-23 does not in principle explicitly include within its scope the seismic design of components and process equipment other than those expressly indicated. Section 5.1(3) of Annex 4 is illustrative in this regard.</p>
Annex 1 1.1.1	COGITISE (Official College of Industrial Technical Experts and Engineers of Seville)	<p>Where it says:</p> <ul style="list-style-type: none"> - The Earthquake-Resistant Standard applies to the project and construction of buildings and civil engineering works in seismic regions <p>It should say:</p> <ul style="list-style-type: none"> - The Earthquake-Resistant Standard applies to the project and construction of buildings, civil engineering works and engineering works of the industrial branch in seismic regions. 	NO	Same justification as the previous one.
	Pedro Antonio Diaz Guirado	It should not be NCSR-22 but NCSE-22, just like the NCSE-02 which was used to be called NCSR erroneously... E from 'Española' (Spanish) since the S is already 'Sismorresistente' (Earthquake-Resistant). I believe this is more accurate.	NO	The name 'NCSR-23' remains. In the case of NCSE-02 and NCSP-07, the last letter made it possible to distinguish between 'Edificación' (Building) and 'Puentes' (Bridges), respectively.
Annex 1 5.6.2	Javier Peinado Adalid	<p>Where it says:</p> <p>Additional comment regarding the increase of the length of</p>	NO	The proposed amendment is not accepted. The observation, however, has resulted in a change to this

		<p>anchorage and overlap in elements in order to give them greater ductility.</p> <p>It should say: The anchor length in reinforcements must be increased by 10 diameters compared to that required in a non-seismic situation, as set out in Annex 19 of the Structural Code.</p>		<p>point, which is finally worded as follows:</p> <p>'For the construction details of the reinforcements, section 8 of Annex 19 of the Structural Code applies, together with the additional rules indicated in the following sections. Alternatively, the reinforcement anchorage and splice lengths may be obtained in accordance with Article 49.5 of the Structural Code (in this case, section 5.6.1(3) and section 5.6.2.1 (2) would not apply).'</p>
The whole document	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	<p>Since the grammar used is confusing, it would be useful to put at the beginning how the verbs used by the articulate 'can', 'should', or to unify it.</p> <p>'Should' is conditional, in Spanish it must go with the conditional if, but in the articulate this does not appear to be the case.</p> <p>With 'can', there is the possibility of not complying with it.</p> <p>'Generally it should be is not legally binding.</p>	YES, PARTIALLY	<p>The cases of 'should' originally present in UNE-EN 1998, have been modified to 'must' or 'will' to make them more mandatory. Only the non-regulatory (informational) appendices use the form 'should'. There are, however, circumstances where you can choose between two or more possibilities: in such cases, the 'can' is generally used.</p> <p>As regards the appearance of 'generally should' in point 3.2.2.5(6) of Annex 1, the wording is amended so that:</p> <p><i>'For the vertical component of the seismic action, generally speaking a coefficient of behaviour, q, no greater than 1.5 should be adopted for all materials and structural systems'.</i></p>
Annex 1	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	<p>Classifying content by materials, as if everything were a whole, does not coincide with construction reality. An earthquake is an action in which the whole building influences and the classes should be of non-material systems.</p>	NO	<p>The original structure of UNE-EN 1998 remains. Different types or rugged systems share structural elements subject to common design criteria. The treatment in a separate regulation of the different systems would be inefficient and impractical. Moreover, in such a case, it could never be exhaustive, as it would unduly constrain the design process.</p>

Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	References should be made to diaphanous floors, usually on the ground floor of buildings. It is mentioned that the coefficient of behaviour is only valid if all floors have similar behaviour, but it is not indicated what is done otherwise.	NO	While the Standard does not require absolute flat-rate regularity (see 4.2.3.3), it must be controlled (see 2.2.4.1(1) and 4.2.3 of Annex 1). In any case, as indicated in 4.4.2.3(3), the formation of a soft floor plastic mechanism should be prevented. The behaviour coefficient value, q , should be reduced for non-regular flat buildings (see 4.2.3.1(7)).
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	The standard does not apply below 0.04 g, but is not made explicit. There is no staggering to indicate what happens at an action of 0.05 g for example.	NO	Point (4) of section 2.2.1 (Criteria of Verification – Generalities) clearly states that it is not necessary to apply the Standard in areas of 'very low seismicity'. This is also indicated in point (5) of section 3.2.1, where in addition the areas of 'very low seismicity' are already defined as those in which the value of the maximum ground reference acceleration type A, a_{gR} , is less than 0.04 g.
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	There is no mention of wind action, which is worse for major period buildings. More than eight floors.	NO	The scope of NCSR-23 is the definition of seismic action, as well as the regulation of seismic design criteria. There is also no need for any link to wind actions; it is the mission of the designer to justify that the design complies with all applicable load combinations. Even if a design in a seismic zone is controlled on account of the wind or other actions, the relevant construction provisions and seismic design limitations imposed by the earthquake-resistant Construction Standard must continue to be respected in any case.
The whole document	José L. de Miguel Rodríguez María Belén Orta Rial	The short form for 'earthquake-resistant standard' is repeatedly used, which does not exist, the adjective of earthquake-resistant applies to the construction, not to the standard.	YES, PARTIALLY	Indeed, the expression is not quite formally correct: it is an abuse of language that makes it possible to simplify exposure. (This form is also contained in NCSE-02 and NCSP-07 and the Commission itself is called 'Earthquake-Resistant Standards Standing Committee').

				Only a few appearances of this expression are modified.
Annex 1 1.3 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	In 1.3 (1) it is for the work not by the type of action, it cannot be just for an earthquake.	NO	It is not just for earthquakes. To this end, the same assumptions are set out in 1.3 of Annex 18 to the Structural Code.
Annex 1 1.3 point (2)	José L. de Miguel Rodríguez María Belén Orta Rial	In 1.3 (2), when it indicates that no changes can be made, to what does this refer? The basic project has no structure and the execution project has no administrative route. The work is done with the book of orders and it cannot be deduced what changes. The construction planning law L.O.E is responsible for administrative matters. In any case, it is not indicated who should justify the changes.	YES	It is worth understanding with respect to the original project and for reasons that have occurred. Point (2) is partially amended to read as follows: <i>'No change to the original project is assumed to take place in the structure during the construction phase or during its subsequent life, unless adequate justification and verification is provided to the property, validated or adopted by the author of the project or, if this is not possible, by another properly qualified technician. Due to the specific nature of the seismic response, this applies even in the case of changes that result in an increase in strength or structural rigidity.'</i>
Annex 1 1.5.2	José L. de Miguel Rodríguez María Belén Orta Rial	In the section: sizing by capacity: Calculation method in which some elements of the structural system are properly chosen, sized and detailed to ensure the dissipation of energy before large deformations, while all other structural elements are equipped with sufficient resistance so that the chosen means of energy dissipation can be maintained. Perhaps it means or is better expressed as follows: Calculation method in which some elements of the structural system are chosen...	YES	The proposed change is accepted, with the wording finally being: <i>'Calculation method in which some elements of the structural system are chosen, sized and detailed to ensure the dissipation of energy in the face of large deformations, while all other structural elements are equipped with sufficient resistance so that the chosen means of energy dissipation can be maintained.'</i>

Annex 1 2.1	José L. de Miguel Rodríguez María Belén Orta Rial	Section 2.1 Basic requirements. It is organised with section (1) and sub-sections a) ... b) ... Note The note refers to the content of the auction (a) so it would be advisable to change the order and put it after sub-section (a) and not sub-section (b).	NO	The current wording is considered sufficiently clear.
Annex 1 2.1 and 2.2	José L. de Miguel Rodríguez María Belén Orta Rial	Sections 2.1 and 2.2: its content is already in the general code whether CE or CTE. There are ELU and ELS, what they are, with what combinations and coefficients of step-up and safety are used. It is in this code of seismic action, one of the actions to consider, there is no project or plans for seismics but an overall project.	NO	Sections 2.1 and 2.2 provide important requirements for the seismic case, including the definition of seismic design action for the non-collapse requirement and for the state of damage limitation. For the combination of actions, it will comply with the provisions of 3.2.4 of Annex 1.
Annex 1 2.1 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	About 2.1 (1) limitation of damages: It is not ELU (which affects security) so it is ELS. But in the CE code or CTE or Eurocode 0 it is said that with accidental actions (and quake it is) there are no checks of ELS. In none of these (characteristic, frequent or almost permanent) do accidental actions apply. The seismic standard is not competent and contradicts the bases of the codes. If you want, you can request the change, but you would have to change the CE, CTE and Eurocode 0.	NO	See the previous response. NCSR-23 does not contradict the calculation bases of Annex 18 of the Structural Code, nor does the EC-8 contradict EC-0.
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	With respect to collapse and damage limitation requirements: the objective is the limitation of damages, but the requirement is collapse and it is assumed that complying with that requirement does not result in damage or will be acceptable, nor will it collapse. As with the arrow, it is a requirement, it is understood that complying with this requirement means that no damage to the partitions occurs.	Comment	In accordance with the provisions of 4.4.3.1(1) of Annex 1: 'The "damage limitation requirement" is considered to have been satisfied if, in the event of a seismic action with a probability of occurrence greater than the calculation seismic action corresponding to the "non-collapse requirement" in accordance with points (1) of 2.1 and (3) of section 3.2.1, collapses between floors are limited pursuant to section 4.4.3.2.'
Annex 1 2.1	José L. de Miguel	In 2.1 (2) note: it refers to the fact that steel structures are regulated by the Structural Code (CE), however, the Technical	NO	Royal Decree 470/2021, of 29 June 2021, adopting the Structural Code states in its single derogatory

point (2)	Rodríguez María Belén Orta Rial	Building Code (CTE) is not repealed meaning that for steel construction structures, you can choose whether to design them according to the CE or the CTE.		provision that any provisions of equal or lower rank that contradict the provisions of this Royal Decree are repealed. DB SE-A should therefore be regarded as repealed as far as it contradicts the provisions of the EC.
Annex 1 2.2.1 point (3) and Annex 1 3.2.1 point (4)	José L. de Miguel Rodríguez María Belén Orta Rial	In 2.2.1 (3) it indicates that in case of low seismicity and well-defined categories simple rules can be used, 3.2.1 (4) again indicates the use of reduced or simplified methods for low seismicity. We have not found in the presented document what those methods or rules are. In any case, looking at the place where these categories are defined is also recommended.	NO	Throughout the Standard it is indicated which specific aspects and requirements can be relaxed or their verification ruled out in cases of low seismicity. As an example, in Annex 1: 4.3.6.4(1), 5.3.1(1), 9.2.2(1), 9.3(2), etc. For clarity, the wording of point 2.2.1(3) is amended and finally: <i>'In cases of low seismicity (see point (4) of section 3.2.1), the fundamental requirements may be satisfied by the application of simpler rules than those indicated in the corresponding annexes to this Earthquake-Resistant Standard.'</i>
Annex 1 2.2.3	José L. de Miguel Rodríguez María Belén Orta Rial	Point 2.2.3 State of limitation of damages section (2) states: In structures that are important for civil protection, the structural system must be checked in case of an earthquake associated with an appropriate return period. It would be useful to define the appropriate return period.	NO	The reference return period for the damage limitation status is indicated in point 2.1(1) of Annex 1. This reference return period is de facto modified by the application of the materiality coefficient corresponding to the structure concerned. See 2.1 and 4.2.5 in Annex 1.
Annex 1 2.2.3	José L. de Miguel Rodríguez María Belén Orta Rial	In 2.2.3 it should be said that, according to the code there are ELU and ELS, that these aim to limit the damage is a matter of the editor of the standard not of the user of it.	NO	The claim in this comment is not understood. See the response to the comment to section 2.1(1).
Annex 1	José L. de	2.2.2 (4) is said in the Structural Code since it is not an exclusive	Comment	Nothing to add

2.2.2 point (4)	Miguel Rodríguez María Belén Orta Rial	matter of seismic action but of the work.		
Annex 1 2.2.2 point (4)	José L. de Miguel Rodríguez María Belén Orta Rial	2.2.2 (4) does not define 'substantial permanent distortions'. This is not defined in the foundation code, nor how it's calculated.	NO	The circumstances are varied. What is considered to be 'substantial permanent distortions' will depend on the individual case and the structure or part of it concerned. The Standard should not unduly constrain the design process.
Annex 1 2.2.2 point (5)	José L. de Miguel Rodríguez María Belén Orta Rial	2.2.2 (5) is already stated in the structural code and this is a rule of seismic action.	NO	This remains.
Annex 1 2.2.4.1 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	In 2.2.4.1 (1) it says 'as far as possible' that is to say nothing.	NO	The Standard seeks not to unduly constrain the design process. What it sets out is a recommendation of regularity and simplicity; but it doesn't demand this. For cases where it cannot be considered that there is regularity in floor or elevation, the Standard establishes particular considerations.
Annex 1 2.2.4.1 point (3)	José L. de Miguel Rodríguez María Belén Orta Rial	In 2.2.4.1 Project, (3), referring to the details of union states that '...should be sized with special care'. That is not specific and from a technical point of view it does not provide information. The standard that replaces NCSE-02 contained a number indicative details for the case of reinforced concrete structures that this standard does not contemplate and therefore they are lost, perhaps they could be preserved.	NO	The draft NCSR-23 standard fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force in Spain. This does not prevent the designer from using the complementary bibliography or construction details that they deem appropriate, provided that they comply with the current regulatory requirements.
Annex 1	José L. de	In 2.2.4.3 (2), it is not defined in the document what is an 'element	NO	It is not necessary. Clause 2.2.4.3 (2) makes this clear.

2.2.4.3 point (2)	Miguel Rodríguez María Belén Orta Rial	of particular structural importance', so it is somewhat subject to interpretation.		It refers to those elements that require in the opinion of the designer a special check during construction. In these circumstances, it will indicate this appropriately in the drawings, as well as the methods of verification to be used.
The whole document	José L. de Miguel Rodríguez María Belén Orta Rial	It is not clear in the document the classification of zones of seismicity, very low, low, high and very high so that it does not lead to different interpretations. In 2.2.4.3 (3), it refers to 'high seismicity regions' without defining them. The section '3.2.1 seismic regions (4)' is the only one that indicates a limit for marking cases of low seismicity ($a_g \cdot S$ not greater than 0.10 g) and very low (a_{gr} less than 0.04 g).	Comment	The definitions of low and very low seismicity are given in points 3.2.1(4) and 3.2.1(5) of Annex 1, respectively. The appearances of the terms <i>moderate</i> , <i>high</i> or <i>high seismicity</i> should be considered semantic in nature and associated with values above those of the low seismicity threshold, without a defined quantitative limit.
Annex 1 3.1.1 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	3.1.1 (1) does not prescribe anything, only links to another section, would be surplus.	NO	It prescribes that appropriate studies must be carried out in order to classify the site according to the types listed in section 3.1.2. This remains.
Annex 1 3.1.2 point (3)	José L. de Miguel Rodríguez María Belén Orta Rial	3.1.2 (3) indicates how the mean velocity of the cutting wave is obtained for a terrain with several layers of various thicknesses. In the case of a plot for constructing a building with layers of different thickness, it should be indicated whether the average of the values thus obtained is carried out or if a weighted average is very variable.	NO	The main use of this value is to assign a class of average land type, estimate a C coefficient of the terrain and, with these two, the soil amplification coefficient S (see 3.2.2.2). It would be reasonable to obtain an average value for such a plot.
Annex 1 3.1.2	José L. de Miguel Rodríguez María Belén Orta Rial	3.1.2 does not indicate whether it is taken from the free surface, from the basement under basements, if any.	YES	The paragraph following equation (3.1) ultimately reads: <i>'where h_i and v_i represent the thickness (in meters) and the speed of the cutting wave (at a level of deformation of 10^{-5} or less) of the i-th formation or layer, of a total of N, existing in the 30</i>

				<i>first metres below the natural surface of the terrain.</i>
Annex 1 3.1.2	José L. de Miguel Rodríguez María Belén Orta Rial	In 3.1.2 in case of terrain S1 or S2, there is no indication as to what has to be done.	NO	3.1.2(4) (and also in subsequent note) states: <i>'At sites with terrain conditions that respond to one of the two special types of terrain, S₁ or S₂, specific studies are required to define seismic action. (...)'</i>
Annex 1 3.1.2 point (3)	José L. de Miguel Rodríguez María Belén Orta Rial	According to 3.1.2 (3) it would seem that you have to explore up to 30 m depth always. In NCSE-02, it was sufficient to assume that the unexplored was like the last explored.	Comment	The section indicates that a value Vs30 is to be estimated. The method of study or exploration used could make it possible to ensure that the rocky substrate is reached before that depth and that it extends to more depth.
Annex 1 3.2.1	José L. de Miguel Rodríguez María Belén Orta Rial	3.2.1 Seismic Regions explains very well how to obtain the seismic action of a point from the grid of Appendix E. What is not clear for a building of a certain size if at each of the points it occupies gives a different value which one is taken. Nor does it indicate whether, as the values in Appendix E have three decimal places, when performing operations it is sufficient to round to three decimal places.	NO	As for decimals, once the interpolation has been performed, it is sufficient to use a value rounded to two decimal places. Taking into account this rounding and the dimensions of the grid of Appendix E with a mesh step of 0.1 degrees in longitude and latitude, the values obtained at the points occupied by a building are not going to be very different.
Annex 1 Table 3.2.	José L. de Miguel Rodríguez María Belén Orta Rial	In table 3.2, it would be advisable to put in the fourth column, second row, a sign to multiply between K and C, unless it is a new variable KC that is not defined.	NO	Does not give rise to confusion; it is understood to be a product.
Annex 1 3.2.2	José L. de Miguel Rodríguez María Belén	It is a bit confusing: the spectra of sections 3.2.2.2 and 3.2.2.3 do not consider the reduction by ductility, here referred to as the coefficient of behaviour q. On the other hand, the spectrum of section 3.2.2.5 does take this ductility into account, it is therefore about simulating, in a simplified way, an analysis with ductility i.e.	NO	This remains. The analysis of the structure is elastic.

	Orta Rial	plastic. Therefore, the last word of the title of this section '3.2.2.5 Calculation spectrum for elastic analysis' is not correct.		
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	Given the insecurity in buildings of low periods, below the plateau, that once subjected to an earthquake, their period is increased and therefore the action increases, since the NCSE-02 eliminated the upward section of the calculation spectrum. This is our question posed to the committee.	NO	In NCSE-02, this approach was carried out only in the simplified calculation method, for the calculation of seismic forces. NCSR-23 adopts the content of the standard UNE-EN 1998-1, together with its corresponding National Annex.
Annex 1 4.2.1.2 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	In 4.2.1.2 (1), I would say: 'The uniformity of the floor is characterised by a regular distribution of the structural elements...' and not structural. It is known a case of a housing building in the corner of Lorca that had to be demolished by the serious structural damage due to the torsion of the building having very asymmetrical non-structural elements that provided asymmetric masses.	YES	Finally, the wording of this point is as follows: <i>'Floor uniformity is characterised by a regular distribution of structural and non-structural, elements, which allows a short and direct transmission of the inertia forces created in the distributed masses of the building. If necessary, uniformity can be achieved by subdividing the entire building into dynamically independent units by seismic joints, provided that these joints are sized to avoid collision between the individual units, in accordance with section 4.4.2.7.'</i>
Annex 1 4.2.1.2 point (2)	José L. de Miguel Rodríguez María Belén Orta Rial	En 4.2.1.2 (2): 'The uniformity in the distribution of the structure and masses along the height of the building...'	YES	Finally, the wording of this point is as follows: <i>'The uniformity in the distribution of the structure and masses along the height of the building is also important, since it tends to eliminate the existence of sensitive areas where the concentration of tensions or high demands for ductility can prematurely cause collapse'.</i>
Annex 1 4.2.1.3 point (1)	José L. de Miguel Rodríguez	In 4.2.1.3 (1) it states that 'horizontal seismic movement is a bidirectional phenomenon', which would indicate that it is multidirectional but that it is sufficient to study it in two orthogonal directions for the building to be able to withstand horizontal actions	NO	It refers to that horizontal movement can be broken down in two directions, or it can be treated as a two-way phenomenon.

	María Belén Orta Rial	in any direction.		
Annex 1 4.2.1.6	José L. de Miguel Rodríguez María Belén Orta Rial	In '4.2.1.6 Adequate Foundation', it would be advisable to indicate what is intended to be achieved so that the designer can achieve this by choosing among the options raised in the section itself in the most appropriate way.	NO	It is considered that the section is sufficiently clear as to its subject matter.
Annex 1 4.2.1.6 point (3)	José L. de Miguel Rodríguez María Belén Orta Rial	4.2.1.6 (3) 'Adequate feeding' should include the action value from which the binding beams are not necessary given the generality of this standard.	NO	See section 5.4.1.2 of Annex 5 (referred to in point cited).
Annex 1 4.2.2	José L. de Miguel Rodríguez María Belén Orta Rial	In 4.2.2 it is said what the main system of structure is, speaking of seismic and gravitational action, but the action of wind remains to be considered.	NO	The scope of NCSR-23 is the definition of seismic action, as well as the regulation of seismic design criteria. In any case, it is the mission of the designer to justify that the design complies with all applicable load combinations.
Annex 1 4.2.2 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	When in 4.2.2 it says that you can 'designate' structural elements (secondary) that are not part of the quake structure. (But this would remain the vertical load, to wind and a fire engine). This aspect will be difficult to implement through programmes, perhaps by hand it would be possible.	Comment	There is no problem in using more than one model for the design of the structure. 'By hand' is considered more complicated.
Annex 1 4.2.2 point (2)	José L. de Miguel Rodríguez María Belén	4.2.2 (2) again does not include the CTE for steel structures when current legislation does allow it.	NO	Royal Decree 470/2021, of 29 June 2021, adopting the Structural Code states in its single derogatory provision that any provisions of equal or lower rank that contradict the provisions of this Royal Decree are repealed. DB SE-A should therefore be regarded as

	Orta Rial			repealed as far as it contradicts the provisions of the EC.
Annex 1 4.2.2 point (3)	José L. de Miguel Rodríguez María Belén Orta Rial	In 4.2.2 (3) it says 'The enclosures and partitions of buildings are considered structural elements unless explicit separation of the structure'. It does not say whether it can or should be. Nor if they are primary or secondary. '...must be included in the calculation model by, for example, including connecting rods with an equivalent rigidity'. But it does not say how to proceed in the general case where they do not connect pillars. 'and they must be checked against the resulting demands,' although the factory code does not say how elements with connecting rods are checked.	YES, PARTIALLY	For the sake of clarity, the wording of this section is amended, finally reading: <i>'All structural elements not designated as secondary seismic elements are considered as primary seismic elements. They are taken as part of the system resistant to lateral forces and must be modelled in the structural calculation in accordance with section 4.3.1, and will be designed and detailed constructively with respect to seismic resistance in accordance with the rules set out in Chapters 5 to 9.</i> <i>The enclosures and partitions of buildings will be classified and designated as structural elements, or as non-structural elements, in accordance with the following principles:</i> <ul style="list-style-type: none"> - <i>The enclosures and partitions of buildings will be considered as non-structural elements when explicitly separated from the structure, in which case the solutions used to maintain stability and functionality.</i> - <i>Regardless of their conditions of connection with the structure, non-structural elements will also be designated as non-structural elements where, due to their low rigidity or resistance, their participation in the building's system resistant to seismic action can be disregarded.</i> - <i>Enclosures and partitions of buildings which are not separated from the structure and which, by reason of their rigidity and strength,</i>

				<p><i>may form part of the system resistant to seismic action of the building will be considered as structural elements (primary seismic elements). In this case, they should be included in the calculation model by, for example, introducing connecting rods of equivalent rigidity into the model and should be checked against the requests resulting from it. When the enclosures and partitions of buildings are to be considered structural elements on the basis of the above, a coefficient of behaviour, q, greater than 2 cannot be adopted.</i></p> <p><i>It is prohibited to modify structural elements throughout the life of the building, including enclosures and partitions if they are classified as such, except as a result of a project supported by a competent technician.</i></p> <p><i>Any change to the original project, including those involving an increase in the strength or rigidity of the modified elements, is prohibited, except as a result of a project justified by a competent technician'.</i></p> <p>In addition, in 5.2.3.6(5), the content in the brackets has been deleted, leaving the final wording as follows:</p> <p><i>'Special rules are given in sections 4.3.6 and 5.9 for brick-filled vats.'</i></p>
Annex 1 4.3.3.2	José L. de Miguel Rodríguez	For the period, in 4.3.3.2, four methods are provided. Needless to say, if they come out differently, it's wise to use the lowest.	NO	The NCSR-23 stresses the need for appropriate modelling of the structure (see points 2.2.4.1(4), 4.2.2(3), 4.3.1(2) and 4.3.1 (8) of Annex 1). The influence of structural and non-structural elements that

	María Belén Orta Rial			<p>may influence the response of the structure must be considered in the modelling of the structure.</p> <p>For the expressions given in section 4.3.3.2.2 for the calculation of the fundamental period, T_1, to be used in the equivalent lateral force method, the same criteria should be understood as applicable.</p>
Annex 1 4.3.3.2.3	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	In formula 4.10, the F and s are unknown. It is necessary to proceed using successive approximations.	Comment	This is not necessary. See point 4.3.3.2.3(1).
Annex 1 4.3.3.2.4	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	In '4.3.3.2.4 Effects of torsion' the formula (4.12) should say that it is for similar parallel porticoes in sections and geometry, then it is for an infinite number of porticoes. You can reduce the coefficient 0.06 in case of limited porticoes as usual, therefore, this is an unreal upper limit.	NO	The original wording remains.
Annex 1 4.3.3.2.2	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	4.3.3.2.2 indicates how to obtain the period of building T1 with approximate formulas, usually when calculating the structures with calculation programmes in which the whole building is not introduced, only the structure, the period is longer giving a minor action and therefore insecure. Perhaps it would be advisable to put a limit on the period obtained with these procedures in order to ensure safety.	NO	<p>The situation that arises would imply that the designer is not complying with NCSR-23.</p> <p>The Standard highlights the need for appropriate modelling of the structure (see points 2.2.4.1(4), 4.2.2(3) and 4.3.1(2) of Annex 1). The influence of structural and non-structural elements that may influence the response of the structure must be considered in the modelling of the structure.</p>
Annex 1 4.3.5.1 point (2)	<p>José L. de Miguel Rodríguez</p> <p>María Belén</p>	In 4.3.5.1 (2) they should be defined or defined as being non-structural elements of great importance or of a particularly dangerous nature, in order not to give rise to subjective interpretation. From what building height?	NO	<p>No specific proposal is made.</p> <p>NCSR-23 adopts the content of UNE-EN 1998-1 (together with its corresponding National Annex).</p>

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Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	The importance coefficient appears as gamma sub I in one section and gamma sub (a) in another, it should be unified unless it relates to two different aspects.	NO	It actually refers to two different aspects. γ_i is the important factor of the structure; while γ_a is the important factor for non-structural elements (see 4.3.5.3 in Annex 1).
The whole document	José L. de Miguel Rodríguez María Belén Orta Rial	When referring to the Structural Code, I understand that 'or legislation replacing it' should be added since each legislation has a different period of use and provides that it can be replaced before the next earthquake legislation.	NO	It is not considered necessary to add the proposed text. In all cases in which a regulation is cited, it is understood what will also apply to the one that repeals and replaces it.
Annex 1 4.4.2.3 point (4)	José L. de Miguel Rodríguez María Belén Orta Rial	In 4.4.2.3 (4) it mentions 'the following condition must be fulfilled at all joints intersecting the primary or secondary seismic beams with the seismic pillars...' or later '...confluence in the joint...' we interpret the word together as a translation of 'joints' when it refers to the union and in Spanish it is called a knot, union or meeting. That also happens in: a. note on page 63, b. in 5.2.3.3 c. in 5.2.3.3 (3), d. penultimate line of page 98, e. in 5.4.3.3 (on several occasions), f. in 5.5.2.3, g. in 5.5.3.3, h. page 111, i. Figure 5.13. j. in 5.8.3 on several occasions, and perhaps in more places in the document that we haven't detected in a quick read. By context it is understood that it refers to the knot or union and in this way the text would be better understood. In the English version of EC-8, it is worded correctly. In 4.4.2.7 joint does mean joint	YES	In the case of beam-pillar joints, in general, where it says 'joints,' it should say 'knots' (or possible: 'unions', depending on the context). Changed.

Annex 1	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	<p>The treatment of structural and non-structural elements is confusing throughout the document, it would make it easier for them to be defined the first time they appear, then cited in other places of the document that regulate them. For example, page 35 states that 'building enclosures and partitions are considered structural elements unless in the case of the explicit separation of the structure...'</p> <p>Since enclosures and partitions are usually deemed non-structural, it should be clarified whether other considerations in the document regarding structural elements also refer to enclosures and partitions or not.</p> <p>Defining from the outset the structural elements including or not the enclosures and partitions would solve this question.</p> <p>If the enclosures and partitions are part of the structure, they cannot be touched, so a note should be included so that in relation to the building, it is reflected in the building book for joint freehold buildings as a servitude because it is common property and therefore is it different in areas of high seismicity from the others?</p>	YES, PARTIALLY	<p>The definition of 'non-structural element' for the purposes of this Standard is set out in 1.5.2(1) in Annex 1.</p> <p>For clarity, this definition is adjusted, leaving the final text as follows:</p> <p>'non-structural element:</p> <p><i>An architectural, mechanical or electrical element, system or component that, either due to the lack of resistance or rigidity or the way it is connected to the structure, is not considered in the seismic load-transmitting project in the seismic loads.</i></p> <p><i>NOTE For the particular case of enclosures and partitions, see 4.2.2'.</i></p> <p>See in addition the response to the observation made to point 4.2.2(3).</p> <p>As regards the servitudes to be established, this is not a matter for the Commission.</p>
Annex 1	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	<p>Defining the coefficient of behaviour in sections separated by material means that it can never appear for different structures such as vertical structures of laminated steel and horizontal concrete that is a type quite used in building when there are few floors; nor for structures with wood forging on brick walls; or horizontal concrete structure on brick walls.</p>	Comment	<p>The selection of the coefficient of behaviour in each direction of analysis must be made according to the ductility and the dissipation capacity that the structure concerned can actually develop in each direction, considering the materials, the structural configuration, the control of the potential fault mechanisms, the appropriate detailed of the critical regions, etc.</p> <p>NCSR-23 adopts the full content of the UNE-EN 1998 standards (together with their corresponding National</p>

				Annexes).
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	Regarding their behaviour: Buildings can be classified within a given type of structure for one of the horizontal directions and into another type for the other horizontal direction, although it is not specifically indicated as appropriate in such a case.	NO	The selection of the coefficient of behaviour in each direction of analysis must be made according to the ductility and the dissipation capacity that the structure can actually develop in each direction, considering the materials, the structural configuration, the control of the potential fault mechanisms, the appropriate detailed of the critical regions, etc. NCSR-23 adopts the full content of UNE-EN 1998-1 (together with its corresponding National Annex). The above principles are considered to be adequately explained and developed throughout the document.
Annex 1 Chapter 5	José L. de Miguel Rodríguez María Belén Orta Rial	'5 Specific Rules for Concrete Buildings' could include details of beams and knots that are contemplated in the current NCSE-02 and which are very useful.	NO	The draft NCSR-23 standard fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force in Spain. This does not prevent the designer from using the complementary bibliography or construction details that they deem appropriate, provided that they comply with the current regulatory requirements.
Annex 1 5.1.1 point (2)	José L. de Miguel Rodríguez María Belén Orta Rial	5.1.1 (2) states that 'concrete buildings with flat floor slabs as primary seismic elements are not fully covered in this chapter' when reading the chapter it is not clear which sections are applicable and which are not.	YES	The following section is deleted: ' <i>Concrete buildings with flat floor slabs as primary seismic elements in accordance with section 4.2.2 are not fully covered in this chapter</i> '.
Annex 1 5.1.1 point (2)	José L. de Miguel Rodríguez María Belén Orta Rial	In 5.1.1 (2) it reads 'primary seismic element' and in the following section 'major earthquake-resistant system'. It may be the same or not.	YES	In addition to the previous reply with regard to point 5.1.1 (2), the wording of this point is amended and finally reads: <i>'Reticular floor slabs or flat slabs on insulated pillars, and concrete porches with flat beams (understood as</i>

				<p><i>those where the width of the beam b_w is greater than the width of the pillar b_c measured perpendicularly to the beam axis) can only be used as part of the system resistant to seismic action (primary seismic elements) in areas classified as low seismicity. Flat beams must always comply with $b_w \leq \min \{b_c + h_w; 2b_c\}$ where h_w is the edge of the beam'.</i></p> <p>The comment also results in the amendment of the second point of section D.1 (a) of Annex 1, as follows:</p> <p><i>'Definition of the resistant system The measures taken to comply with the basic project principles (section 4.2.1) will be indicated. Construction elements designated as primary and secondary seismic elements (section 4.2.2), as well as non-structural elements. The classification will be explicitly justified on the basis of the contribution of each system to rigidity in relation to horizontal actions in each direction concerned, explicitly indicating the measures taken to avoid interaction between structural and non-structural elements'.</i></p> <p style="text-align: center;">***</p> <p>In addition, and after the revision of the sections on floor slabs, there is a certain contradiction between points 5.10(2) and 5.11.3.5(3) of Annex 1. In terms of the correction, point (2) of section 5.10 has been amended to read as follows:</p> <p><i>'A prefabricated floor slab or cover with a concrete compression layer in situ may be considered as a diaphragm if that layer:</i></p>
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				<p><i>a) complies with the requirements of section 5.11.3.5;</i></p> <p><i>b) is armed in both horizontal directions with at least the minimum reinforcement specified in Annex 19 to the Structural Code;</i></p> <p><i>c) its reinforcement is connected to the beams or walls supporting the forging;</i></p> <p><i>d) is concreted on a clean and rough substrate, or connected to that substrate through shear connectors; and</i></p> <p><i>e) is sized in such a way as to provide the rigidity and strength required for diaphragms.</i></p>
Annex 1 5.1.1 point (2)	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	<p>5.1.1 (2) limits the use of reticular forgings or flat slabs on insulated pillars and reinforced concrete structures with flat beams as the main resistant earthquake system of the building to areas classified as low seismicity.</p> <p>Arguing that these are construction systems widely used in Spain and that they can be given a low ductility, or behavioural factor, but if they are properly armed and come to analyse the knots are sufficiently resistant solutions. You always have to calculate and question the result. In Lorca, everything was forged from flat beams and only two successive façades of the building that had small columns collapsed.</p>	Comment	<p>No specific proposal is made.</p> <p>The original wording of this section is maintained since the National Annex of UNE-EN 1998-1.</p>
Annex 1	<p>José L. de Miguel Rodríguez</p> <p>María Belén Orta Rial</p>	<p>From our point of view we understand that it is necessary to clearly indicate in relation to the construction systems used in Spain, which are accepted and the calculations that must be made.</p>	NO	<p>NCSR-23 fully adopts Eurocode 8, by transcribing it and adapting it to the specific regulations in force in Spain.</p>

Annex 1 5.2.3.3 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	In 5.2.3.3 (1), fragile breakage is not defined in the codes.	Comment	Nothing to add.
Annex 1 5.2.3.4	José L. de Miguel Rodríguez María Belén Orta Rial	In 5.2.3.4 it mentions stickers on the pillars, however, it is shown that the supports fail by buckling before plastic joints appear on them.	Comment	It is clear that to achieve the objectives of 5.2.3.4, the design of the pillars must not be controlled by buckling.
Annex 1 5.3	José L. de Miguel Rodríguez María Belén Orta Rial	In '5.3 Dimensioning in accordance with Annex 19 of the Structural Code' would raise the possibility of adding... or code to replace it.	NO	It is not considered necessary to add the proposed text. In all cases in which a regulation is cited, it is understood what will also apply to the one that repeals and replaces it.
Annex 1 5.4.2.2	José L. de Miguel Rodríguez María Belén Orta Rial	It is stated in 5.4.2.2 that 'should assume that the plastic joints are formed at the ends, either of the beam...' That happens when it is calculated only with seismic action. By combining seismic action with gravitational action, for which there is always at least the permanent loads. The joints are not always given on it two ends of the beams, it depends on how it is assembled. The joint will come out where quake overflows to the above (permanent wind, for example). The project is calculated for everything, not just for earthquakes. With permanent and earthquakes the joints are at one end (the leeward*) while the other joint (windward*) moving away from the end. (*mention of wind for the purposes of understanding).	Comment	In porticoes where the beams receive considerable gravitational loads, plastic joints with rotation in one direction could be generated within the vain of the beam. Of course, this must be kept in mind by the designer when sizing and assembling these elements. Where appropriate, the provisions of 5.5.3.1.3 (1) of Annex 1 of NCSR-23 will apply, considering as a critical section, in addition to the ends (which must always be the case), any other section of the vain of the beam when it is capable of plasticising in the seismic calculation situation.
Annex 1 Chapter 5	José L. de Miguel	It is not clear throughout Chapter 5 how to proceed in case of concrete buildings with basements, a type of construction usual in	Comment	The principles and requirements of Chapter 5 are general in nature.

	Rodríguez María Belén Orta Rial	Spain.		<p>This results in changes in point (1) of section 5.4.3.4.2. It is finally worded as:</p> <p><i>'The critical zone height, h_{cr}, above (and, where applicable, below) from the base of the wall can be estimated as follows: (...)</i></p> <p><i>(...) where h_s is the free height of the floor, and where the base is defined as the level of foundation or underrun in basement floors with rigid diaphragms and perimeter walls (see point (5) of section 5.8.1)'.</i></p>
Annex 1 5.4.3.3	José L. de Miguel Rodríguez María Belén Orta Rial	In Construction Details 5.4.3.3, it would be convenient to include some detail in case of the reversal of moments or in case of a lot of disparity for the correct anchoring and continuity of the reinforcement, in square when necessary. Just as details are included in the previous sections.	Comment	The reference seems erroneous, 5.4.3.3 does not include a 'construction details' section. In any case, no specific modification or contribution is provided.
Annex 1 5.6.2	José L. de Miguel Rodríguez María Belén Orta Rial	In '5.6.2 Anchoring the reinforcements', it should be included that if there is inversion or at least much disparity of beam moments on both sides of a support, the balance is established in one part of the moment of the beam that has it greater, with that of the other beam that has it less and the rest against the support. In this case the reinforcements must be anchored, one straight against the other and others squared against the support. If the sign of M of beams is opposite then all squared against the support. Such issues are not mentioned in the document and they should be reflected somewhere. The only beam-pillar junction figure is Figure 5.13 and it provides no indications to this end. In constructions with more than 3 floors, efforts are already invested in areas of medium seismicity.	Comment	The required anchor lengths must be respected in accordance with the provisions of 5.6, either with hook or straight extension, where practicable. It is clear that where the geometric dimensions of the design do not allow the necessary anchor lengths to be accommodated, the design must be modified or the relevant construction arrangements adopted. Moreover, it is not the aim of this Standard to provide construction details that provide for each possible particular situation. NCSR-23 adopts the Eurocode 8 with its corresponding National Annex.
Annex 1	José L. de Miguel Rodríguez	I have not found references to short pillars except in section 5.8.2, which states that 'short joining pillars between the upper face of a shoe or a stud and the plane of the tied beams or foundation	Comment	NCSR-23 contemplates the use of 'short pillars'. These types of elements are likely to fail in a fragile to sharp way, to which end, design by capacity is imposed (see

	María Belén Orta Rial	beams' should be avoided. The only building that collapsed in Lorca was due to the short pillars and this was not the case. I understand that based on this experience, it should be suggested that short pillars should be avoided in all cases and in case of semi-basements the basement wall should be arranged up to the first forged to avoid this situation. Another type of union can also be suggested in case of not being able to avoid the short pillar in order to give it less rigidity.		5.2.3.3 and 5.4.2.3 in Annex 1). In addition, the particular case of short pillars generated by duress due to brick fillings is dealt with in section 5.9(2) of Annex 1. However, it is a good practice to try to avoid as much as possible such configurations in the conception of an earthquake-resistant design.
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	With regard to tethering and foundation beams, it is shown that they do not perform their function properly if the pieces (shoes or studs) that join or connect them do not have the same edge.	Comment	It does not provide any specific input or specific sections.
Annex 1 5.9 point (1)	José L. de Miguel Rodríguez María Belén Orta Rial	In 5.9 part (1) refers to honeycomb wall partitions, the term 'wall' makes them sound resistant, which is not the case.	NO	It is not correct: this doesn't just mean honeycomb wall partitions.
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	Currently in Spain for steel structures both the structural code and the CTE DB-SE-A for are is in force.	NO	Royal Decree 470/2021, of 29 June 2021, adopting the Structural Code states in its single derogatory provision that any provisions of equal or lower rank that contradict the provisions of this Royal Decree are repealed. DB SE-A should therefore be regarded as repealed as far as it contradicts the provisions of the EC.
Annex 1 6.4 point (2)	José L. de Miguel Rodríguez María Belén	In 6.4 (2) it states 'the analysis of the structure can be performed assuming that all elements of the earthquake-resistant structure are active', without defining what an active earthquake-resistant structure is.	NO	6.4 (2) makes not mention of 'active earthquake-resistant structure'.

	Orta Rial			
Annex 1	José L. de Miguel Rodríguez María Belén Orta Rial	The elastic arrow with gravitational loads horizontally, with earthquake loads exceed all elastic limits. 'Assuming infinite resistance' should be added.	Comment	No specific sections or points are identified.
Annex 1 Chapter 7	José L. de Miguel Rodríguez María Belén Orta Rial	In chapter 7 about mixed steel and concrete, buildings with steel supports and beams and concrete floor slabs should be included.	Comment	NCSR-23 adopts the content of the standard UNE-EN 1998-1, together with its corresponding National Annex.
Annex 1 Chapter 8	José L. de Miguel Rodríguez María Belén Orta Rial	In chapter 8 there is no mention of wooden slab floor buildings on brick walls which are very typical in rural architecture.	Comment	NCSR-23 adopts the content of the standard UNE-EN 1998-1, together with its corresponding National Annex.
Annex 1 Chapter 9	José L. de Miguel Rodríguez María Belén Orta Rial	Chapter 9 Brick Buildings: In EC-6 there is no unarmed brick, the armed brick refers to the armed only to bed joint. For earthquake is something else, the armed brick must be horizontally and vertically.	Comment	What is indicated here is not correct. Chapter 9 of Annex 1 should apply, which, in effect, considers vertical reinforcement and not only bed joints. In particular, for armed manufacturing, consider the provisions of section 9.5.4.
Annex 1 9.3	José L. de Miguel Rodríguez María Belén Orta Rial	9.3 should define what is confined brick.	NO	The definition of 'confined brick' can be found in the Technical Building Code (Annex A of the DB SE-F). It has not been accepted, but has resulted in a change to point (7) of section 9.5.3 of Annex 1, now reading as:

				'There will be boards of a diameter not less than 6 mm (...)'.
Annex 1 Appendix D	José L. de Miguel Rodríguez María Belén Orta Rial	Appendix D: project documents. Since this corresponds to another code, mention should be made of that code and indicate that this other code should also be included. In case of construction, it should also be distinguished what goes in the initial project and what goes in the final project or in the construction dossier. The structural information for the project has no administrative route.	YES, PARTIALLY	The first subparagraph of section D.1 finally reads as follows: <i>'Except in the case of constructions located in regions of very low seismicity, the project documentation will include, in addition, within the structural report, a specific chapter dedicated to the verification of the response of the construction to the earthquake, containing at least the following sections: (...)'</i>
Annex 3	José L. de Miguel Rodríguez María Belén Orta Rial	The structural assessment criteria are in a mandatory code, the CTE of the same ministry and the latter proposes something else. The basis of how and when to evaluate and how to rehabilitate are in CTE. This standard cites regulations in force. But does not respect it.	Comment	To this end, 'structural assessment' should not be confused with 'seismic assessment'. Nor 'rehabilitation' with 'seismic adjustment'. See section 1.1 for the subject-matter and scope of Annex 3.
Annex 3	José L. de Miguel Rodríguez María Belén Orta Rial	It is always assumed that everything is analysed and checked against this standard, regardless of whether the work was done in its time with others (seismic, concrete, actions, etc.) and therefore it will not be able to fulfil anything at present. You can't try to check anything except against the regulations of when it was made.	Comment	Annex 3 examines the seismic assessment of buildings in the light of more up-to-date knowledge in the field of earthquake-resistant design, in order to decide whether or not to intervene in their structure and, where appropriate, to design the seismic adequacy measures that may be necessary.
Annex 3	José L. de Miguel Rodríguez María Belén Orta Rial	Structural and non-structural elements in this annex are different from Annex 1.	Comment	No justification or specific sections or points are provided.
Annex 3	José L. de	Mention should be made of wood, in existing buildings this	NO	It would not be possible to add 'wood' here.

1.1 point (4)	Miguel Rodríguez María Belén Orta Rial	material is used a lot.		Only 'concrete, steel and brick' are indicated because they are the three materials treated respectively in Appendices A, B and C. NCSR-23 has adopted Eurocode 8, and in this case there is no equivalent Appendix for wood in UNE-EN 1998-3. However, as indicated in the NOTE of this point, the above-mentioned Appendices are not regulatory in nature, containing only recommendations and additional information in accordance with the basic requirements of Annex 1.
Annex 3 1.1 point (6)	José L. de Miguel Rodríguez María Belén Orta Rial	It says 'possibly contain important hidden errors', which should be referred to as hidden vices.	NO	The original translation of UNE-EN 1998-3 is maintained.
Annex 5	José L. de Miguel Rodríguez María Belén Orta Rial	It does not include aspects of real building with basements or half-sided which are very common in Spain and in seismic areas.	NO	The comment is not related to any section, nor does it provide concrete input.
Annex 5	José L. de Miguel Rodríguez María Belén Orta Rial	It is not intended for urban building, closed block.	NO	The comment is not related to any section, nor does it provide concrete input.
Annex 5	José L. de Miguel Rodríguez	The construction works with basement have floors that arch in all directions rather than beams in two directions; it is only necessary to calculate it to size it and assemble it according to the calculations, indicating the procedure would help users to opt for	NO	The commentary does not provide specific sections or inputs. The provisions of point 4.2.1.6(3) of Annex 1 and section 5.4.1.2 of Annex 5 are maintained.

	María Belén Orta Rial	cheaper and therefore more sustainable solutions.		
The whole document	ASECI	The solution proposed by ASECI for the processing of the new earthquake-resistant standard NCSR-22 would consist of drafting the NCSR by reference to UNE-EN-1998 together with its National Annex, with the date of the standard in force and providing for the possibility of updating the UNE-EN-1998 by Ministerial Order. This procedure, which is perfectly viable from a legal point of view, would resolve the inconsistencies, mentioned in this letter, of the references to Spanish regulations.	NO	See Appendix A.
The whole document	ACHE	<p>It states:</p> <p>1- Whereas as regards the structural project, the new NCSR-22 standard should not reproduce Eurocode 8 but refer in full to UNE EN-1998 and its National Annexes, respecting all the references included in this standard, allowing its joint application with the rest of Eurocodes. This reference should also be made to the current version and the published national annex, so that the update of NCSR-22 to the second generation of Eurocodes would be very quick after the publication of the national annex.</p> <p>2- That, if the current draft Royal Decree is maintained, the Additional provision should not be limited to projects developed by public sector bodies or entities, but should be general in nature.</p> <p>3- That the Additional Provision should explicitly allow the use of the remaining Eurocodes where they are referred to by the corresponding UNE-EN 1998.</p>	NO	See Appendix A.
The whole document	ACIES	<p>REQUESTS:</p> <p>FIRST: The adoption of European seismic legislation (Eurocode 8, UNE-EN-1998) by direct reference in its entirety, without changes or substitutions of references to other Eurocodes by references to</p>	NO	<p>See Appendix A.</p> <p>As for the requested transitional period of 36 months from the entry into force of the Royal Decree, it is too long for the objectives of this draft regulation.</p>

		<p>national regulations.</p> <p>SECOND: That the NCSR-22 Earthquake-Resistant Construction Standard incorporates an automatic update clause so that when UNE publishes the second generation of Eurocodes, which is currently in its final phase of voting procedures in Europe, and its corresponding National Annexes are available, the second generation of Eurocode 8 enters immediately into force.</p> <p>THIRD: That a transitional period of 36 months be established from the entry into force of the Royal Decree, for compliance with the document.</p>		
Annex 1 4.2.1.1 point (1)	<p>Luis Pallarés Rubio</p> <p>Francisco J. Pallarés Rubio</p>	<p>Where it says:</p> <p>(1) Structural simplicity, characterised by the existence of clear and direct trajectories for the transmission of seismic forces, is an important objective to pursue since the modelling, analysis, sizing, construction detail and construction of simple structures are subject to much less uncertainties and, consequently, the prediction of their seismic behaviour is much more reliable.</p> <p>It should say:</p> <p>(1) Structural simplicity, characterised by the existence of clear and direct trajectories for the transmission of seismic forces, is an important objective to pursue since the modelling, analysis, sizing, construction detail and construction of simple structures are subject to much less uncertainties and, consequently, the prediction of their seismic behaviour is much more reliable. In cases of complex seismic interactions between different construction elements, it is advisable to adopt construction solutions that reduce the seismic interaction between them, thus allowing to simplify the transmission of seismic forces to reduce uncertainties and improve the reliability of prediction in the response of seismic behaviour.</p>	NO	The proposed amendment is not considered necessary.

Annex 1 4.2.2 point (3)	Luis Pallarés Rubio Francisco J. Pallarés Rubio	<p>Where it says:</p> <p>The enclosures and partitions of buildings are considered structural elements unless explicitly separated from the structure, in which case the solutions used to maintain their stability and functionality will be described.</p> <p>It should say:</p> <p>The enclosures and partitions of buildings are considered structural elements unless explicitly separating the structure or adoption of construction solutions that guarantee the significant non-participation of these elements in the structural seismic response. Subject to these caveats, the solutions used to maintain their stability and functionality will be described.</p>	NO	<p>This point has been amended in response to another observation.</p> <p>The following text will be added as a commentary in point (3) of section 4.2.2:</p> <p><i>'COMMENT The adoption of construction solutions that reduce the dynamic interaction of the enclosures and partitions (in particular, the filling walls) with the structure can improve their vulnerability and integrity, as well as reducing the forces transmitted by them to the structure'.</i></p>
Annex 1 4.2.2 point (3)	Luis Pallarés Rubio Francisco J. Pallarés Rubio	<p>Where it says:</p> <p>Enclosures and partitions of buildings that have not been separated from the structure and which can therefore form part of the primary earthquake-resistant system should be included in the calculation model by, for example, including connecting rods of equivalent rigidity in the model and must be checked against requests resulting from it. Where the enclosures and partitions of buildings are to be considered structural elements on the basis of the above, a performance coefficient q greater than 2 cannot be adopted.</p> <p>It should say:</p> <p>Enclosures and partitions of buildings that have not been separated from the structure or where no construction solutions have been adopted to ensure that they are not significantly involved in the structural seismic response and which can therefore form part of the primary earthquake-resistant system,</p>	NO	See the reply to the above comment.

		should be included in the calculation model by, for example, including connecting rods of equivalent rigidity and should be checked against requests resulting from it. Where the enclosures and partitions of buildings are to be considered structural elements on the basis of the above, a performance coefficient q greater than 2 cannot be adopted.		
Annex 1 4.3.5.1 point (1)	Luis Pallarés Rubio Francisco J. Pallarés Rubio	<p>Where it says:</p> <p>(1) Non-structural elements (appendices) of buildings (e.g. parapets, hatches, antennas, mechanical equipment and supplementary installations, curtain walls, partitions, railings) that could, in the event of failure, cause damage to people or affect the main structure of the building or the services of critical facilities, must be checked, together with their supports, to resist the seismic calculation action.</p> <p>It should say:</p> <p>(1) Non-structural elements (appendices) of buildings (e.g. parapets, hatches, antennas, mechanical equipment and supplementary installations, curtain walls, partitions, railings) that could, in the event of failure, cause damage to people or affect the main structure of the building or the services of critical facilities, must be checked, together with their supports, to resist the seismic calculation action.</p> <p>In addition to the analysis carried out, given the random nature of the seismic action, the uncertainties entailed and the serious damage to human life caused by the failure of these non-structural elements, in anticipation of a possible failure, it is advisable, when possible, to implement these additional containment systems to avoid damage to people or conditions to the main structure of the building or to the services of the critical facilities. For example, the use of straps or clamps to contain water accumulators or mechanical equipment in case of failure, in addition to the anchor designed in the analysis phase.</p>	NO	<p>The proposed amendment is not accepted; however, it results in changes in wording, leaving 4.3.5.1(1) as follows:</p> <p><i>'Non-structural elements (appendices) of buildings (e.g. parapets, hatches, antennas, mechanical equipment and supplementary installations, curtain walls, partitions, enclosures, railings, etc.) which could, in the event of failure, cause damage to people or affect the main structure of the building or the services of critical facilities, must be checked, together with their supports, connections and fastenings or anchorages, to resist the seismic calculation action'.</i></p>

Annex 1 4.3.6.1 point (2)	Luis Pallarés Rubio Francisco J. Pallarés Rubio	<p>Where it says:</p> <p>(2) Although the scope of sections 4.3.6.1 to 4.3.6.3 is limited pursuant to point (1) of this section, these sections provide good practice criteria, the monitoring of which may be positive for concrete, steel or mixed DCM or DCL class structures with brick fillers. In particular, for panels that could be vulnerable to breakage by exiting your plane, the placement of tethers can reduce the danger caused by falling brick</p> <p>It should say:</p> <p>(2) Although the scope of sections 4.3.6.1 to 4.3.6.3 is limited pursuant to point (1) of this section, these sections provide good practice criteria, the monitoring of which may be positive for concrete, steel or mixed DCM or DCL class structures with brick fillers. In particular, for panels that could be vulnerable to breakage by exiting your plane, the placement of tethers can reduce the danger caused by falling brick In addition, the adoption of construction solutions that reduce the dynamic interaction of fillers in the structural response can lead to the reduction of fill damage, thus reducing the danger caused by falling brick.</p>	NO	The proposed text is not in line with the subject-matter of the section. As indicated in 4.3.6.1(1), this section applies to filler brick 'in contact with the portico (i.e. without special separation joints)'.
Annex 1 4.3.6.2 point (4)	Luis Pallarés Rubio Francisco J. Pallarés Rubio	<p>Where it says:</p> <p>(4) Possible adverse local effects due to portico-filler interaction should be taken into account; for example, the cutting stress break of the pillars induced by the action of the diagonal connecting rods of the fillers (see chapters 5 to 7).</p> <p>It should say:</p> <p>(4) Possible adverse local effects due to portico-filler interaction should be taken into account; for example, the cutting stress break</p>	NO	The proposed text is not in line with the subject-matter of the section. As indicated in 4.3.6.1(1), this section applies to filler brick 'in contact with the portico (i.e. without special separation joints)'.

		<p>of the pillars induced by the action of the diagonal connecting rods of the fillers (see chapters 5 to 7).</p> <p>In addition to the analysis, the adoption of construction solutions that reduce the dynamic interaction between pillars and fillers is advisable to reduce transmitted forces.</p>		
Annex 1 4.3.6.4 point (2)	<p>Luis Pallarés Rubio</p> <p>Francisco J. Pallarés Rubio</p>	<p>Where it says:</p> <p>(2) Lightweight wire meshes well anchored to one side of the wall, the wall straps attached to the pillars and placed within the horizontal joints (bed joints), and the concrete poles and transverse straps to the panels that embrace the entire thickness of the wall are examples of measurements, in accordance with point (1) of this section, to improve the performance and integrity of brick fillers, both in their plane and outside their plane.</p> <p>It should say:</p> <p>(2) Lightweight wire meshes well anchored to one side of the wall, the wall straps attached to the pillars and placed within the horizontal joints (bed joints), and the concrete poles and transverse straps to the panels that embrace the entire thickness of the wall are examples of measurements, in accordance with point (1) of this section, to improve the performance and integrity of brick fillers, both in their plane and outside their plane. Likewise, the adoption of construction solutions that reduce the dynamic interaction between the filling walls and the structure can improve the behaviour and integrity of the fillers.</p>	NO	<p>The proposed text is not in line with the subject-matter of the section. As indicated in 4.3.6.1(1), this section applies to filler brick 'in contact with the portico (i.e. without special separation joints)'.</p>
Annex 1 5.9 point (4)	<p>Luis Pallarés Rubio</p> <p>Francisco J. Pallarés Rubio</p>	<p>Where it says:</p> <p>(4) The length, l_c, of the pillars on which the stress is exerted due to the diagonal connecting rod of the filling will be checked by shearing for the lower of the values of the following two shear stresses: the horizontal component of the connecting rod force of the filler, assumed to be equal to the horizontal shear strength of</p>	NO	<p>The original wording remains.</p> <p>However, the observation provided gives rise to a COMMENT in 4.2.2(3):</p> <p><i>'COMMENT The adoption of construction solutions that reduce the dynamic interaction of the enclosures</i></p>

		<p>the panel, estimated according to the shear strength of the horizontal joints; or (b) the shear stress calculated in accordance with section 5.4.2.3. or 5.5.2.2., depending on the ductility class, assuming that the bending resistance reserve capacity of the pillar, $pRd \cdot MR_{c,i}$, develops at both ends of the contact length, l_c. The contact length will be assumed to be equal to the total vertical width of the diagonal connecting rod of the filling. Unless a more accurate estimation of this width is made, taking into account the elastic properties and geometry of the filler and of the pillar, it can be assumed that the width of the connecting rod is a fixed fraction of the length of the diagonal of the panel.</p> <p>It should say:</p> <p>(4) The length, l_c, of the pillars on which the stress is exerted due to the diagonal connecting rod of the filling will be checked by shearing for the lower of the values of the following two shear stresses: the horizontal component of the connecting rod force of the filler, assumed to be equal to the horizontal shear strength of the panel, estimated according to the shear strength of the horizontal joints; or (b) the shear stress calculated in accordance with section 5.4.2.3. or 5.5.2.2., depending on the ductility class, assuming that the bending resistance reserve capacity of the pillar, $pRd \cdot MR_{c,i}$, develops at both ends of the contact length, l_c. The contact length will be assumed to be equal to the total vertical width of the diagonal connecting rod of the filling. Unless a more accurate estimation of this width is made, taking into account the elastic properties and geometry of the filler and of the pillar, it can be assumed that the width of the connecting rod is a fixed fraction of the length of the diagonal of the panel.</p> <p>In all cases, in addition to the analysis indicated in the previous points, the adoption of construction solutions that reduce the dynamic interaction between the pillars and the filling walls can improve the vulnerability and integrity of the fillers and decrease the cutting forces transmitted to the pillars.</p>		<p><i>and partitions (in particular, the filling walls) with the structure can improve their vulnerability and integrity, as well as reducing the forces transmitted by them to the structure'.</i></p>
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	AICCPIC	The Association of Engineers of Roads, Canals and Ports REQUESTS that the draft Royal Decree for the adoption of the NCSR-22 be withdrawn and replaced by a text that refers to Eurocode 8 and enables its use in both public and private works.	NO	See Appendix A.
The whole document	Alejandra Mallavia	The draft standard does not indicate the reference regulations for the justification of wood and brick earthquake-resistant structures. The structural code does not cover either wooden or brick structures.	NO	See, respectively, sections 8.1.1(1) and 9.1(2) of Annex 1. Not accepted, but has resulted in changes to point 9.1(2) of Annex 1, adding for clarity, ' <i>of the Technical Building Code</i> ', The final wording is as follows: <i>'For the brick building project, the provisions of the Basic Document DB SE-F 'Structural security: brick' of the Technical Building Code. The following rules complement those set out in that regulation.</i>
	José María Goicolea Ruigómez Hugo Corres Peiretti Miguel Fernández Ruiz Ivan Muñoz Díaz Miguel Ángel Astiz Suárez Alejandro Pérez Caldentey	* The preparation of a new Spanish Earthquake-Resistant Standard through reproduction of Eurocode 8 replacing references to other Eurocodes with references to Spanish structural codes results in the mixture of regulatory bodies of different origin, thus breaking technical coherence and can lead to situations that compromise security. * Therefore, European seismic legislation (Eurocode 8, UNE-EN-1998) should be adopted by direct reference in its entirety, without changes or replacements of references to other Eurocodes by references to national regulations. The 'direct referral' technique adopted in other European countries to incorporate Eurocodes into their national legislation is the only way to ensure the internal consistency of the set of rules applied, as well as harmonisation with Europe. * It is of the utmost importance that the NCSR-22 Earthquake-Resistant Construction Standard incorporates an automatic update	NO	See Appendix A.

	<p>Juan Carlos Mosquera Feijóo</p> <p>Javier Pascual Santos</p> <p>Carlos Zanuy Sánchez</p> <p>José María Arrieta Torrealba</p> <p>Miguel Ortega Cornejo</p> <p>Álvaro Serrano Corral</p>	<p>clause so that as soon as UNE publishes the second generation of Eurocodes and its corresponding National Annexes are available, the second generation of Eurocode 8 enters immediately into force.</p> <p>* The training and skills of structural engineering professionals must be focused on European criteria and regulations, meaning that as part of our teaching, the reference regulations are the Structural Eurocodes.</p>		
Annex 1 2.2.4.1 point (4)	ICOG - Illustrious Official College of Geologists	<p>Where it says: (4) The calculation should be based on an appropriate structural model which, where necessary, should take into account the influence of soil deformability, non-structural elements, and other aspects, such as the presence of adjacent structures.</p> <p>It should say: (4) The calculation should be based on an appropriate structural model that should take into account the influence of soil deformability, non-structural elements, and other aspects, such as the presence of adjacent structures.</p>	NO	The modification is not appropriate, given that it will not be necessary in all cases to consider the model of the above aspects (and therefore should not be required).
Annex 1 3.1.1 point (1)	ICOG	<p>Where it says: (1) Appropriate studies should be carried out in order to classify the site according to the types listed in section 3.1.2.</p>	NO	The proposal is not much more concise or concrete, it is sufficient to say: <i>appropriate studies</i>

		<p>It should say:</p> <p>(1) Appropriate geological, geotechnical, geophysical or other studies should be carried out in order to accurately and reliably classify the terrain according to the types listed in section 3.1.2.</p>		
Annex 1 3.1.1 point (2)	ICOG	<p>Where it says:</p> <p>(2) Additional guides concerning the study and classification of the terrain are given in section 4.2 of Annex 5.</p> <p>It should say:</p> <p>(2) Additional technical criteria concerning the study and classification of the terrain are included in section 4.2 of Annex 5.</p>	YES	Accepted: ' <i>Additional technical criteria</i> '
Annex 1 3.1.1 point (3)	ICOG	<p>Where it says:</p> <p>(3) The construction location and the nature of the land underpinning it will normally be free from risks of land breakage, slope instability and permanent settling caused by liquefied or densification in the event of an earthquake. The possibility of the occurrence of such phenomena should be studied in accordance with the requirements of Chapter 4 of Annex 5.</p> <p>It should say:</p> <p>(3) The construction location and the nature of the land underpinning it must be free from risks of land breakage, slope instability and permanent settling caused by liquefaction or densification in the event of an earthquake. Therefore, the mandatory geotechnical study must quantitatively analyse the possibility of the occurrence of such phenomena in accordance with the requirements of Chapter 4 of Annex 5, proposing the necessary mitigation measures, if identified.</p>	NO	<p>The original wording remains.</p> <p>In the chapter 4 of Annex 5, to which reference is made, details how this type of assessment should be carried out (section 4.1.1 and et seq.)</p> <p>The term liquefied is more accurate according to the RAE.</p>
Annex 1 3.1.1 point (4)	ICOG	<p>Where it says:</p> <p>(4) Depending on the type of importance of the structure and the particular conditions of the project, ground studies or geological studies should be carried out in order to determine the seismic action. Additional investigations to those required for sizing against</p>	NO	This point establishes the need to develop specific field studies in view of adjusting the seismic action and the particular conditions of when these studies can be omitted.

		<p>non-seismic loads in the case of major class I buildings may be avoided in accordance with Table 4.3 (see section 4.2.5). They can also be omitted for buildings of major class II according to Table 4.3, provided that there is a survey of the terrain up to a depth sufficient to allow the interpretation that the characteristics of the terrain do not worsen from that depth.</p> <p>It should say:</p> <p>(4) Depending on the type of importance of the structure and the particular conditions of the project, geological-geotechnical studies must be carried out in order to determine with precision and reliability the seismic action they have to withstand. Additional investigations to those required for sizing against non-seismic loads in the case of major class I buildings may be omitted in accordance with Table 4.3 (see section 4.2.5). Additional investigations may also be omitted in buildings of major class II in accordance with Table 4.3, provided that the geotechnical study prescribed by the CTE makes it possible to justify and interpret that the characteristics of the terrain do not worsen from the recognised depth of research, at least up to 30 m deep. For buildings of major classes III and IV, geotechnical studies that, in accordance with the precepts of the CTE, directly characterise the terrain to at least 30 m deep will be required. In the case of other structural types not covered by the ETC (bridges, silos, reservoirs, pipes, foundations, containment structures, etc.) or land works (dismounts and embankments), the designer will classify in a justified way their importance with respect to the buildings and according to the consequences of the earthquake.</p>		
Annex 1 3.1.2 point (1)	ICOG	<p>Where it says:</p> <p>(1) To take into account the influence of local terrain conditions on seismic action, the average land types A, B, C and D described by stratigraphic profiles and parameters given in Table 3.1 and detailed below can be used. This can also be done taking into</p>	YES, PARTIALLY	The value of Vs for fixing the rocky substrate in engineering (<i>engineering bedrock</i>) usually takes different conventional values (760 m/s, 800 m/s or 1 500 m/s). According to the European scope Vs is taken ≥ 800 m/s.

		<p>account, in addition, the influence of deep geology on seismic action.</p> <p>It should say: (1) To take into account the influence of local terrain conditions on seismic action, sites will be classified according to the average land types A, B, C and D described by stratigraphic profiles and parameters $v_{s,30}$ indicated in Table 3.1. This can also be done taking into account, in addition, the influence of deep geology on seismic action, for what will be considered as seismic substrate when $v_s > 1\,500$ m/s.</p>		<p>The wording of 3.1.2(1) is amended and ultimately reads:</p> <p><i>'To take into account the influence of local terrain conditions on seismic action, the mean land types A, B, C and D described by stratigraphic profiles and the V_{s30} parameter indicated in Table 3.1 may be used. This can also be done taking into account, in addition, the influence of deep geology on seismic action, for which the formation located at a depth from which $v_s \geq 800$ m/s will be considered as rocky substrate'.</i></p>
Annex 1 Table 3.1.	ICOG	<p>Where it says: In the tens of metres closest to the surface, predominance of dense granular soils or hard cohesive soils or the presence of thin layers of loose or cohesive granular soils.</p> <p>It should say: In the 30 m closest to the surface, predominance of dense granular soils or hard cohesive soils, with sporadic presence of thin layers (maximum thickness of 2 m) of loose or cohesive granular soils.</p>	NO	This is a qualitative description for a broad class; it doesn't seem necessary to constrain it further.
Annex 1 Table 3.1.	ICOG	<p>Where it says: In the tens of metres closest to the surface, predominance of granular soils of medium compactness or cohesive soils of firm or very firm consistency or presence of layers of fairly thick granular soils loose or cohesive soft.</p> <p>It should say: In the 30 m closest to the surface, predominance of granular soils of medium compactness or cohesive soils of firm to very firm consistency, with sporadic presence of layers of loose or cohesive granular soils.</p>	NO	This is a qualitative description for a broad class; it doesn't seem necessary to constrain it further.

Annex 1 Table 3.1.	ICOG	<p>Where it says: In the tens of metres closest to the surface, the predominance of layers of great thickness of loose or cohesive granular soils.</p> <p>It should say: In the 30 m closest to the surface, the predominance of layers of great thickness of loose or cohesive granular soils.</p>	NO	This is a qualitative description for a broad class; it doesn't seem necessary to constrain it further.
Annex 1 3.1.2 point (1)	ICOG	<p>Where it says: The terrain is classified according to its ability to amplify the seismic movement that occurs in the rock, which depends on the thickness of the surface soils and the average rate of propagation of transverse seismic waves. The terrain may be homogeneous or consist of several layers of the following types (from I to IV):</p> <ul style="list-style-type: none"> – Type I terrain layer: Compact rock or cemented soil, with propagation rate of transverse elastic waves $v_s > 800$ m/s. – Type II terrain layer: Highly altered or highly fractured rock, dense granular soils or hard cohesive soils, with propagation rate of transverse elastic waves $800 \text{ m/s} \geq v_s > 360$ m/s. – Type III terrain layer: Medium compact granular soil or cohesive soil of firm to very firm consistency, with propagation rate of transverse elastic waves $360 \text{ m/s} \geq v_s > 180$ m/s. – Type IV terrain layer: Loose granular soil or soft cohesive soil, with propagation rate of transverse elastic waves $v_s \leq 180$ m/s. <p>We propose: Remove this classification inherited from the previous NCSE-02, since it can be confused with Table 3.1. and does not add value to the annex, since the determination procedures of $v_{s,30}$ and the subsequent coefficient C are specified below, ignoring these typologies).</p>	NO	This classification, actually inherited from the NCSE-02 and adopted by this Commission as part of the EC-8 National Annex and integrated into the NCSR-23, is the one that allows to describe the terrain in depth, from the layers that compose it and thus estimate a speed V_{s30} to obtain a more adjusted classification of the terrain.
Annex 1 3.1.2 point (1)	ICOG	<p>Where it says: The classification of the ground layer type (I to IV) is made by means of the velocity v_s of propagation of the transverse waves corresponding to a tangential deformation of 10^{-5} or less.</p>	NO	<p>The current wording is maintained. The justification given is not correct. Ground layers (not medium ground types) are classified by their velocity V_s (average) but not by the</p>

		<p>Preferably v_s should be determined directly. In addition, static or dynamic penetration tests can be used in granular soils, in cohesive soils for simple compression resistance, and in rocks and soils the rate of propagation of longitudinal seismic waves.</p> <p>It should say: The classification of the ground type (A to D) is made by determining the average value of the velocity v_s of propagation of transverse waves corresponding to a tangential deformation of 10^{-5} or less, for a depth of 30 m. For Class III and IV buildings and other similar structures, v_s must be determined directly. For Class II buildings and similar, structures may be used for the estimation of v_s recognised and verified correlations: in granular soils, with static or dynamic penetration tests; in cohesive soils, with the resistance to simple compression or cutting in situ, without drainage.</p> <p>We propose:</p> <ul style="list-style-type: none"> - a complete modification of this section, based on table 3.1 derived from EC8, which sets the criteria for determination/estimation of v_s according to the importance classification, giving prescriptive priority to direct dynamic methods, and updating the correlationable static tests. - Eliminating the correlation with V_p, since a direct relationship with V_s is not guaranteed (it depends heavily on the Poisson coefficient and usually has a high dispersion) and where the use of seismic methods by refraction does not penetrate in case of the inversion of the speed with the depth, and therefore neither the scope nor the reliability of the record is guaranteed. 		<p>V_{s30} parameter. The velocity of the P waves (or the given ranges of this one) is one more parameter for this classification. This should not be omitted.</p>
Annex 1 3.1.2 point (1)	ICOG	<p>Where it says: Type I ground layers typically possess longitudinal elastic wave velocity $v_p > 2\,000$ m/s. Type II ground layers typically possess longitudinal elastic wave velocity $v_p > 1\,000$ m/s, granulars, impact in SPT tests $N_{1.60} > 40$</p>	NO	<p>These parameters were adopted by this Commission, as part of the EC-8 National Annex. The velocity of the P waves (or the given ranges of this one) is one more parameter for this classification. This should not be omitted.</p>

		<p>and resistance at tip of the static penetrometer $q_p > 15$ MPa, and cohesive resistance to simple compression $q_u > 500$ kPa.</p> <p>Type III terrain layers usually possess, granular, impact in SPT tests $40 \geq N_{1,60} > 15$ and strength at the tip of the static penetrometer $15 \text{ MPa} \geq q_p > 6 \text{ MPa}$, and cohesive simple compression strength $500 \text{ kPa} \geq q_u \pm 150 \text{ kPa}$</p> <p>Type IV ground layers usually have parameters $N_{1,60}$, q_p, q_u smaller than those indicated for other types.</p> <p>We propose:</p> <ul style="list-style-type: none"> - that a table with an indicative character is included, where, according to the current state of the art, the Vs are correlated with static parameters such as $N_{1,60}$ (SPT), q_p (CPT), q_u (RCS), C_u (vane test or pressure measurement), indicating the limitations in terms of reliability of each test. - removing suggestions in relation to correlation with V_p for the reasons given in the previous comment, as they can lead to confusion and error. 		
Annex 1 3.1.2 point (1)	ICOG	<p>Where it says:</p> <p>In each actual terrain (from A to D), formed by N layers of different types of terrain, the mean velocity of the transverse elastic waves $v_{s,30}$ is determined as set out in section 3.1.2(3).</p> <p>We propose:</p> <p>This section explains the proposed two comments earlier, so it can be added to it and deleted here.</p>	NO	That is incorrect. The section explains what needs to be done to determine or classify the actual terrain, based on the N layers (as defined in the previous points) that make up it.
Annex 1 3.1.2 point (2)	ICOG	<p>Where it says:</p> <p>(2) The location will be classified according to the mean velocity value of the cutting wave, $v_{s,30}$. In another case, the value of N_{SPT} will be used.</p>	YES	

		It should say: (2) The location will be classified according to the mean velocity value of the cutting wave, $v_{s,30}$.		
Annex 5 4.1.2 point (1)	ICOG	Where it says: (1) Buildings of Classes II, III and IV, as defined in section 4.2.5 of Annex 1, must not be constructed in the vicinity of tectonic faults classified as seismically active according to the state of existing knowledge. It should say: (1) Buildings of classes II, III and IV, as defined in section 4.2.5 of Annex 1, and other structures of similar importance must not be constructed less than 500 m away from tectonic faults classified as seismically active based on existing knowledge.	NO	Not accepted. This section has been modified differently based on other comments.
Annex 5 4.1.2 point (2)	ICOG	Where it says: (2) The absence of movements in the Upper Pleistocene (last 129 000 years) can be used as a criteria for identifying non-active faults for most structures that are not critical to public safety. It should say: (2) The absence of movements in the Upper Pleistocene (last 129 000 years) can be used as a criteria for identifying non-active faults, based on official updated databases.	YES, PARTIALLY	The current wording of point 4.1.2 (2) has been maintained. The following NOTE is added: <i>'NOTE A fault can be classified as seismically active if a specific investigation is certified by a competent public administration'.</i>
Annex 5 4.1.2 point (3)	ICOG	Where it says: (3) Special geological studies should be carried out for urbanisation plans and for important structures that are built near potentially active faults, in order to determine the dangerousness in terms of ground breakage and magnitude of seismic motion. It should say: (3) Special geological studies should be carried out for urbanisation plans and for classifiable structures such as III and IV that are constructed at a distance of less than 15 km of seismically	NO	The current wording: 'Urban development plans and those for important structures' is sufficient. Specific studies would be needed to justify the proposed distance and magnitude thresholds.

		active faults with a potential magnitude $M_s \geq 6.5$, in order to determine the danger in terms of ground breakage and magnitude of seismic motion.		
Annex 5 4.2.2 point (4)	ICOG	<p>Where it says: (4) In stable terrain, the profile of ground-wave propagation speeds, v_s, should be considered as the most reliable indicator on which to base the determination of the characteristics of the seismic action depending on the type of location.</p> <p>It should say: (4) In terrain type A, B and C, the profile of ground-wave propagation speeds, V_s, should be considered as the most reliable indicator on which to base the determination of the characteristics of the seismic action depending on the type of location. For Class III and IV buildings, obtaining v_s through proven geophysical methods will be required up to a depth of at least 30 m.</p>	NO	The current wording is maintained. Stable land refers to land not affected by fault breakage effects, slope instability, settling, liquefied, etc. The latter would require another type of parameter setting process or treatment.
Annex 5 4.2.2 point (5)	ICOG	<p>Where it says: (5) In regions of high seismicity, especially in type D, S1, or S2 terrains (see section 3.1.2. of Annex 1), the V_s profile will be obtained in situ by applying geophysical methods inside the probes.</p> <p>It should say: (5) In regions of high seismicity, especially in type D, S1, or S2 terrains (see section 3.1.2. of Annex 1), the V_s profile will be obtained in situ up to 30 m deep by applying geophysical methods inside the probes.</p>	NO	It is understood that this means a V_s speed profile in depth. Exploration would not have to be limited to a depth of 30 m.
Annex 5 4.2.2 point (6)	ICOG	<p>Where it says: (6) In any other case, when determining the natural periods of ground vibration, the V_s profile can be estimated by empirical correlations with in situ penetration resistance or other geotechnical properties, taking into account the dispersion of these correlations.</p>	YES, PARTIALLY	<p>The original wording is amended, with the text finally being:</p> <p><i>'In any other case, when the natural periods of ground vibration are to be determined, the V_s profile can be estimated by empirical correlations with in situ penetration resistance or other geotechnical properties</i></p>

		<p>It should say:</p> <p>(6) Except for Class I buildings, the natural periods of ground vibration will be determined. For Class II it may be estimated by empirical correlations with geometric and geotechnical properties of the substrate; for Classes III and IV, they will be determined by instrumental measurements in situ.</p>		<i>(taking into account the dispersion of such correlations), or be determined by instrumental measurements in situ.'</i>
Royal Decree, preamble	<p>Rosario Cornejo Arribas</p> <p>Álvaro Parrilla Alcaide</p>	<p>NCSR Authorship:</p> <p>The text of the Royal Decree states:</p> <p>'The Standing Committee on Earthquake-Resistant Standards, in the exercise of its functions, has drawn up a new Standard of Earthquake-Resistant Construction...'</p> <p>This statement is not correct because the members of the Commission have been appointed by Order of the Ministry of the Presidency, Relations with the Courts and Democratic Memory of 30 May 2022 and its first contact with the NCSR proposal (a rule of more than 600 pages), was on 13 June 2022 (...)</p> <p>Please state that the NCSR can be traced to Eurocode 8 and remove the section reproduced at the start of this section.</p>	YES, PARTIALLY	See Appendix B.
The whole document	<p>Rosario Cornejo Arribas</p> <p>Álvaro Parrilla Alcaide</p>	<p>Identification of the technical paper writer:</p> <p>It is considered essential that the promoters of the NCSR project be clearly identified and their affiliation is of general knowledge.</p> <p>The identification and dissemination of the promoters' details.</p>	NO	See Appendix B.
The whole document	<p>Rosario Cornejo Arribas</p> <p>Álvaro Parrilla Alcaide</p>	<p>Intellectual property:</p> <p>Do not proceed with the processing of the NCSR until written authorisation from CEN for the reproduction of the standard is available, or a report from the State Legal Service in which, having regard to Eurocode 8 and the proposal of NCSR, it is indicated that there is no breach of intellectual property law.</p>	NO	See Appendix B.

RD, additional provision	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>The RD includes an Additional Provision that provides for the application of Eurocode 8, but only of this Eurocode, requiring it to be used in conjunction with national regulations.</p> <p>This Additional Provision is conceptually very different from the Second Additional Provision contained in Royal Decree 70/2021 adopting the Structural Code, which expressly recognises the validity of all Eurocodes ('the EN 1990 to 1999 series standards') as a way of complying with that Structural Code in its scope.</p> <p>Please include an additional provision equivalent to the DA2 of Royal Decree 470/2021, which expressly recognises the validity of all the Eurocodes for the seismic zone structures project.</p>	NO	See Appendix B.
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>References to the instructions for actions on road and rail bridges, IAP-11 and IAPF-07:</p> <p>Please delete any reference to IAP and IAPF, including in Comments.</p>	NO	See Appendix B.
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>References to other Eurocodes contained in UNE-EN 1998:</p> <p>The Eurocodes have been drafted to be used together. The system of cross-references in Eurocodes consists of thousands of references to one another.</p> <p>To facilitate the understanding of this problem, some examples, merely for the purposes of illustration, are provided below:</p> <p>- Example C. The NCSR-22 proposal replaces references to UNE-EN 1992 with references to the Structural Code. This Code contains in its articulate a procedure for calculating the anchor lengths of the reinforcements different from the UNE-EN 1992 method. This procedure allows reductions in the anchor lengths of the bars in the concrete that do not guarantee the plastification of them in the areas of 'plastic joints', which is a key aspect in the</p>	YES, PARTIALLY	See Appendix B.

		<p>behaviour of the structures against earthquake (...)</p> <p>- Example D. The proposal of NCSR-22 (clause 4.1.2 of Annex 2) specifies the values of the combination coefficients and, simultaneously, refers to the Instructions for Actions in Spanish Bridges, when the values listed in them for these coefficients are different: $\psi_2=0.3$ for high-traffic bridges in the proposal for NCSR-22 compared to $\psi_2=0$ in the Spanish Actions Regulation. (...)</p> <p>- Example E. The formulation of thermal action with Spanish regulations results in values very on the side of insecurity compared to those defined in UNE-EN 1991-1-5. The NCSR-22 proposal, which replaces the reference to UNE-EN 1991-1-5 with a reference to IAP-11/IAPF-07, results in the undervaluation of the seismic situation of thermal actions, which has an important effect on the sizing of certain structural elements.</p> <p>In the event that it is not regulated by direct reference to Eurocode 8, we ask for the 435 references to other Eurocodes that have been replaced by other non-equivalent referrals to be incorporated directly into the NCSR proposal.</p>		
The whole document	<p>Rosario Cornejo Arribas</p> <p>Álvaro Parrilla Alcaide</p>	<p>Responsibility of the author of the project in case the Eurocodes are applied:</p> <p>In the NCSR proposal, the following phrase is repeated more than 25 times:</p> <p>'The specific regulations in force or, failing that, the specific technical documents that the author of the project, at their responsibility, deems most appropriate will apply'</p> <p>(...) it is considered inappropriate that the NCSR proposal allocates responsibility to the author of the project for the use of Eurocodes, when these European standards have a very important legal coverage in European legislation, logically transferred to the Spanish legal</p>	NO	See Appendix B.

		<p>system.</p> <p>Please remove from the allocation of responsibility to the author of the project from the NCSR proposal in case the Eurocodes are applied in the project, in contradiction with European legislation.</p>		
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>Progress made with earthquake-resistant engineering over the past two decades:</p> <p>The NCSR proposal reproduces the text of UNE-EN 1998 which was drafted more than twenty years ago. Its content and calculation procedures are now obsolete (...)</p> <p>In the event that it is not regulated by direct reference to Eurocode 8, it is requested to incorporate into the NCSR proposal the progress achieved by earthquake-resistant engineering in the last two decades.</p>	NO	See Appendix B.
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>Need for a study supporting the technical content of the NCSR:</p> <p>(...) All Spanish structural regulations have traditionally had supporting technical studies and examples of calibration. This is basic. The result of the implementation of the structural regulations cannot be an unknown, it has to be evaluated before their adoption. (...)</p> <p>In case it is not regulated by direct reference to Eurocode 8, carry out a study developed by specialists in seismic engineering that technically validates the content of the NCSR proposal including the change of regulatory references before continuing with their processing.</p>	NO	See Appendix B.
The whole document	Rosario Cornejo Arribas Álvaro Parrilla	<p>Non-compliance with the agreements adopted by CPNs in 2014 and 2016:</p> <p>At the meeting of the CPNs on 20 November 2014, the following</p>	Comment	See Appendix B.

	Alcaide	<p>was unanimously agreed: 'As a final decision, it is accepted by the Commission that the update of the earthquake-resistant legislation is undertaken by adopting Eurocode-8 and its corresponding National Annex'.</p> <p>In line with this unanimous decision, the draft RD was prepared, which was technically approved unanimously at the CPNs meeting on 23 June 2016, as set out in the minutes of that meeting.</p> <p>The draft RD technically approved by the CPNs consisted of six pages, with no annexes, and basically consisted of direct block referral to Eurocode 8 with the Spanish National Annexes.</p> <p>The NCSR proposal does not follow the principle of direct referral and therefore contravenes the unanimous agreements adopted at the CPNs.</p>		
The whole document	<p>Rosario Cornejo Arribas</p> <p>Álvaro Parrilla Alcaide</p>	<p>Feasibility of direct referral to Eurocodes in Spanish regulations:</p> <ul style="list-style-type: none"> - Report of the State Legal Service <p>Consulted by the State Advocacy at MITMA on regulatory alternatives in Spain, which issued a report dated March 8, 2019, the conclusions of which stated:</p> <p>'It is for the body responsible for the preparation of these general provisions to decide which option is most appropriate [the CPNs in the case of the NCSR] among those at its disposal (reproduction of the fragments of Rules to which a referral is made, bulk referral, reference to fragments, referral by subject, for example) (...)</p> <p>(...) 'it is possible to draw up a Technical Regulation by referring to the provisions contained in the UNE-EN 1990 Standards to UNE-EN 1999, known as Euro Structural Codes.'</p> <ul style="list-style-type: none"> - Opinion No 1083/2019 of 23 January 2020 of the Council of State <p>Opinion No 1083/2019 of the Council of State sets out the legal bases that support the possibility of regulating by way of reference to European standards. (...)</p> <p>The decision to refer or reproduce the Eurocodes in Spanish</p>	Comment	See Appendix B

		regulation is therefore a technical and non-legal issue. Obviously, the wording of the NCSR by reference to Eurocode 8, will imply the adjustment of the rest of the Spanish structural regulations, but this need for readjustment occurs whenever one of those interrelated regulations is updated. The situation from this point of view is the same whether it is referred or reproduced.		
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>Explicit prohibition on the mixing of regulatory bodies: The structural safety risks inherent in the combined use of regulatory bodies of different origin are well known, which is why the structural regulations of various European countries have expressly prohibited the mixing of Eurocodes with national regulations, which is incomprehensibly binding on the NCSR proposal.</p> <p>This is the case, for example, of the Portuguese Regulatory Office No 21/2019, which Approves the conditions for using Structural Eurocodes in building structure projects (see Article 6.2). It should be borne in mind that Portugal is a country whose regulatory tradition is very similar to the Spanish one and that, as you can see, has replaced its set of structural codes with a three-page regulation containing the Eurocodes list.</p> <p>It is requested that the three pages of the Portuguese regulation be analysed in order to apply in Spain the same solution that, in such a sensible way, has been adopted by our neighbouring country.</p>	NO	See Appendix B
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>Deadline for submissions: (...) - The CPNS has only met once in six years (the meeting of 23 June 2016 was followed by the meeting of 20 June 2022). - The members of the CPNS had a week between the distribution of the text and the meeting to discuss it (13-20 June 2022). - For the hearing and public information process in Spain, the shortest possible deadline allowed by law is 15 working days</p>	Comment	See Appendix B

		<p>(midday on 8 to 29 July 2022).</p> <p>- Furthermore, this public information process is carried out in the middle of summer, which is a de facto impediment to the participation of professionals in the procedure.</p> <p>All this for a text that is more than six hundred pages long, for which in Europe other countries dedicate several years of debate and numerous votes and submissions of comments, all of which have been attended to and answered properly.</p>		
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>Need for consensus in the Spanish technical community</p> <p>It is understood that a text of this importance for the safety of structures in Spain must enjoy the maximum consensus in the technical community that must apply it.</p> <p>It is requested not to continue with the processing of the NCSR until the necessary consensus is reached and the technical comments that have been expressed in different areas in recent weeks are addressed, many of which are reflected in this letter.</p>	NO	See Appendix B
The whole document	Rosario Cornejo Arribas Álvaro Parrilla Alcaide	<p>Conclusion</p> <p>It is considered that the appropriate way to solve all the problems affecting the NCSR proposal, as set out in this letter, is to draft the Spanish seismic legislation by direct reference to UNE-EN 1998 together with its National Annex, with the date of the regulation currently in force and with the possibility of updating the version by ministerial order.</p> <p>With this solution, which, as indicated above, is perfectly viable from the legal point of view, the problem introduced in the NCSR proposal would be solved by the change of the system of normative references and would greatly facilitate the updating of the Spanish seismic standard moving forwards.</p>	NO	See Appendix B
Annex 1 1.6.2	Álvaro González	Where it says: (Missing, between the definitions of E_d and N_{SPT})	YES, PARTIALLY	Included in 1.6.2 of Annex 1, between the definitions of E_d and N_{SPT} :

	Gómez	It should say: <i>M</i> Earthquake Magnitude		<p><i>'M_w Earthquake Magnitude, Moment Magnitude Scale Used'</i></p> <p>And <i>M_s</i> entry in section 1.6.9 has been removed to define the magnitude of the earthquake.</p> <p>All occurrences of <i>M</i> or <i>M_s</i> from this Annex 1, referring to magnitude of an earthquake, are changed to <i>M_w</i>.</p> <p>This observation is also verified in the rest of the annexes, and the same correction process is performed, where appropriate.</p>
Annex 1 1.6.9	Álvaro González Gómez	<p>Where it says: <i>M</i> superstructure mass <i>M_s</i> Magnitude</p> <p>It should say: <i>M_s</i> superstructure mass <i>M</i> Magnitude</p>	NO	<p>See corrections indicated in the previous reply.</p> <p><i>M_w</i> is the symbol ultimately used to define the magnitude of an earthquake.</p>
Annex 1 3.2.1	Álvaro González Gómez	<p>Where it says: The value of magnitude <i>M</i> of the earthquake to be considered for the definition of artificial accelerograms – point 3.2.3.1.2(2) of this Annex – and for liquefy calculations – Appendix B Table B of Annex 5 – is <i>M_w</i> = 6 when <i>K</i> is less than or equal to 1.1 and <i>M_w</i> = 8 when <i>K</i> is greater than 1.1</p> <p>It should say: The value of magnitude <i>M</i> of the earthquake to be considered for the definition of artificial accelerograms – point 3.2.3.1.2(2) of this Annex – and for liquefaction calculations – Appendix B Table B of Annex 5 – is <i>M</i> = 6 when <i>K</i> is less than or equal to 1.1 and <i>M</i> = 8 when <i>K</i> is greater than 1.1</p>	NO	<p>See response to comment in section 1.6.2 of Annex 1.</p> <p><i>M_w</i> is the symbol ultimately used to define the magnitude of an earthquake.</p>

Annex 1 10.6	Álvaro González Gómez	Where it says: 'magnitude $M_s \geq 6.5$ ' (in two places in the text) It should say: 'magnitude $M \geq 6.5$ '	NO	See response to comment in section 1.6.2 of Annex 1. M_w is the symbol ultimately used to define the magnitude of an earthquake.
Annex 5 Appendix B B.2	Álvaro González Gómez	Where it says: 'magnitude different from $M_s = 7.5$ (where M_s is the magnitude of surface waves)' and 'Table B.1 – Values of the coefficient CM M_s CM' It should say: 'magnitude different from $M = 7.5$ (where M is the magnitude of the earthquake in magnitude moment scale)' and 'Table B.1 – Values of the coefficient CM M CM'	NO	See response to comment in section 1.6.2 of Annex 1. M_w is the symbol ultimately used to define the magnitude of an earthquake. Moment magnitude scales, M_w , and surface wave scales, M_s , can be considered equivalent in the magnitude range given in Table B of Appendix B1 to Annex 5, so the change of M_s by M_w is considered appropriate, even if this table was originally performed for M_s values.
Annex 5 Appendix B Figure B.1:	Álvaro González Gómez	Where it says: Figure B.1 – Relationship between the tension ratio generating liquefaction and values N_1 (60) for clean sands and slim sands subjected to earthquakes of magnitude $M_s = 7.5$ It should say: Figure B.1 – Relationship between the tension ratio generating liquefaction and values N_1 (60) for clean sands and slim sands subjected to earthquakes of magnitude $M = 7.5$	NO	See response to comment in section 1.6.2 of Annex 1. M_w is the symbol ultimately used to define the magnitude of an earthquake.
Annex 1	Álvaro González Gómez	Where it says: In all other places where ' M ' is used to denote the 'superstructure mass': - Formula 10.1 and its explanation in the text. - Formula 10.4 - Formula 10.5 It should say:	NO	The note remains.

		M_s		
Annex 1 Appendix C.3	Álvaro González Gómez	Where it says: 'M' referred to 'Bending moment' (in various places in the text and figures) It should say: (Replace with another unused note for other variables.)	NO	The note remains. It can be distinguished based on the context.
Annex 1 1.1.1 point (2)	PRINCIPIA Ingenieros Consultores	Where it says: 'Special structures, such as nuclear power plants, open sea structures and large dams are...' We recommend replacing this with: 'Special structures such as nuclear power plants, liquefied natural gas plants, open sea structures and large dams are...'	YES	
Annex 1 1.4 point (2)	PRINCIPIA Ingenieros Consultores	Where it says: 'tensions and resistances' We recommend replacing this with: 'tensions'	YES	
Annex 1 1.4 point (2)	PRINCIPIA Ingenieros Consultores	Where it says: 'moments (bending, etc.)' We recommend replacing this with: 'moments'	YES	
Annex 1 1.5.1 point (1)	PRINCIPIA Ingenieros Consultores	Where it says: 'Structural code' We recommend replacing this with: 'Structural Code'	YES	
Annex 1 1.6.2	PRINCIPIA Ingenieros Consultores	Where it says: ' c_u ground cutting resistance in the drain-free test' We recommend replacing this with: ' c_u undrained cohesion' or ' c_u cutting resistance without drainage' or ' c_u undrained cutting resistance'	YES	Amended to ' c_u cutting resistance without drainage'
Annex 1 1.6.2	PRINCIPIA Ingenieros	Where it says: ' d_g the value of...'	YES	

	Consultores	We recommend replacing this with: ' d_g value of...'		
Annex 1 1.6.2	PRINCIPIA Ingenieros Consultores	Where it says: ' V_{s30} mean speed value...' We recommend replacing this with: ' V_{s30} harmonic mean speed...'	NO	It would strictly be a harmonic mean weighted by the thicknesses of each of the layers. Since the formula (3.1) defines how this parameter is calculated, it is not considered necessary to modify this text.
Annex 1 2.1 point (3)	PRINCIPIA Ingenieros Consultores	Where it says: '...earthquake return period...' We recommend replacing this with: '...seismic action return period...' or '...ground movement return period...'	YES	Amended to: ' <i>Ground movement return period</i> '
Annex 1 2.1 point (4)	PRINCIPIA Ingenieros Consultores	Where it says: '...of the Standard...' We recommend replacing this with: '...of this Standard...'	YES	
Annex 1 2.1 point (4)	PRINCIPIA Ingenieros Consultores	Where it says: '... usually around 3.' We recommend replacing this with: '... usually around 3 and being able to justify the most appropriate value in each case.' [or similar expression]	NO	For the purposes of this standard, the generic value set $K=3$, uniform for all users and on which the factors of importance and the change of return period entailed have been based. The use of a variable K would result in the use of different important factors, or the consideration of different return periods. However, this aspect should be taken into account in future reviews.
Annex 1 3.1.2	PRINCIPIA Ingenieros Consultores	Where it says: '... elastic waves ...' We recommend replacing this with: '... waves ...'	NO	The term elastic waves is valid and appears as such in numerous academic texts.
Annex 1 3.1.2	PRINCIPIA Ingenieros Consultores	Where it says: '... resistance in tip ...' We recommend replacing this with: '... resistance by tip ...'	YES	
Annex 1	PRINCIPIA	Where it says: 'elastic displacement spectrum'	YES	

3.2.2.2 point (6)	Ingenieros Consultores	We recommend replacing this with: 'elastic response spectrum in terms of displacement'		
Annex 1 3.2.2.2 point (6) (NOTE)	PRINCIPIA Ingenieros Consultores	Where it says: 'response elastic spectrum' We recommend replacing this with: 'elastic response spectrum'	YES	Amended in this and other appearances in the text.
Annex 1 3.2.2.3 Table 3.3.	PRINCIPIA Ingenieros Consultores	Where it says: 'vertical response elastic spectrum' We recommend replacing this with: 'vertical elastic response spectrum'	YES	
Annex 1 3.2.2.3 Table 3.3. (NOTE)	PRINCIPIA Ingenieros Consultores	Where it says: '... vertical elastic response spectrum ...' We recommend replacing this with: '... vertical elastic response spectrum ...'	YES	
Annex 1 3.2.2.5 point (2)	PRINCIPIA Ingenieros Consultores	Where it says: '... regarding the elastic ...' We recommend replacing this with: 'regarding the elastic response ...'	YES	
Annex 1	José Antonio Álvarez Gómez José Miguel Azañón Hernández Ariadna Canari Bordoy Carolina Canora Catalan	We propose that the definition and characteristics of what is to be considered as 'potentially active failure' be generally performed in Annex 1, within a subsection in point 3 (Land conditions and seismic action). In order to contribute to integrating all the definitions described in a dispersed manner throughout the standard, the following text is proposed: 'The presence of potentially active faults that may affect the planned works will be taken into account. A <i>potentially active fault</i> is considered as one that fails to meet any of the following requirements: ● Its average slip rate is equal to or greater than 1 mm/year.	Yes, PARTIALLY	The definition and characteristics of 'potentially active failure' are incorporated in section 1.5.2 of Annex 1. The wording is ultimately as follows: <i>'potentially active fault:</i> <i>Fault that meets any of the following requirements:</i> ● <i>Its average slip rate is equal to or greater than 1 mm/year.</i> ● <i>There is evidence of a rupture or cosmic deformation in the surface of the ground over the past 129 000 years (from the beginning of the Upper Pleistocene, to</i>

<p>Julián García Mayordomo</p> <p>Jorge Gaspar Escribano</p> <p>Octavi Gómez Novell</p> <p>Álvaro González Gómez</p> <p>Paula Herrero Barbero</p> <p>Juan Miguel Insua Arévalo</p> <p>Raquel Martín Banda</p> <p>Ivan Martín Rojas</p> <p>José Jesús Martínez Díaz</p> <p>Eulàlia Masana Closa</p> <p>María Ortuño Candela</p> <p>Hector Perea Way</p>	<ul style="list-style-type: none"> • There is evidence of a rupture or cosmic deformation in the surface of the ground over the past 129 000 years (from the beginning of the Upper Pleistocene, to the present day). • It has associated seismic activity attested to in instrumental seismological records, or deduced from historical, archaeological or geological information, always within the last 129 000 years. <p>Potentially active faults can produce two types of effects to be considered in each project based on its particular characteristics:</p> <ul style="list-style-type: none"> • Direct effects, caused by breakage or deformation of the surface as a result of the displacement of the ground on both sides of the fault. • Near field effects on ground movement, involving anomalously high seismic acceleration values, and which may include directivity effects on seismic rupture propagation that generate seismic wave amplification effects. <p>To identify and locate potentially active faults, the active fault databases published by public institutions should be consulted, as well as the specialised and updated scientific literature.</p> <p>If there are potentially active faults in the vicinity of a projected building of particular importance (classes II, III and IV, as defined in section 4.2.5 of Annex 1), it is recommended that a specific geological and geotechnical study of them be carried out, by a competent professional, in order to find out their potential to affect that building, mapping them accurately, specifying their degree of activity, and determining whether they have seismogenic potential and deforming the surface of the ground.'</p>	<p><i>the present day).</i></p> <ul style="list-style-type: none"> • <i>It has associated seismic activity attested by the instrumental seismological record, or deduced from historical, archaeological or geological information, always within the previous 129 000 years</i> <p><i>NOTE The terms 'potentially active fault' and 'seismically active fault' are used in this Standard without distinction.</i></p>
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	José Luis Sánchez Roldán			
Annex 5 4.1.2 point (1)	<p>José Antonio Álvarez Gómez</p> <p>José Miguel Azañón Hernández</p> <p>Ariadna Canari Bordoy</p> <p>Carolina Canora Catalan</p> <p>Julián García Mayordomo</p> <p>Jorge Gaspar Escribano</p> <p>Octavi Gómez Novell</p> <p>Álvaro González Gómez</p> <p>Paula Herrero Barbero</p> <p>Juan Miguel Insua Arévalo</p>	<p>Where it says: Buildings of Classes II, III and IV, as defined in section 4.2.5 of Annex 1, must not be constructed in the vicinity of tectonic faults classified as seismically active according to the state of existing knowledge.</p> <p>It should say: Buildings of Classes II, III and IV, as defined in section 4.2.5 of Annex 1, must not be constructed in the vicinity of tectonic faults classified as seismically active according to the state of existing knowledge. For these purposes, it will be considered that a fault is close to the projected building if, in the event of an earthquake associated with said fault, the breakage of the fault or the permanent deformation of the ground around it may affect the construction. An additional distance should be considered as a safety margin, taking into account the uncertainty when it comes to mapping the fault as regards the cartographic scale used.</p>	YES	<p>The proposed amendment was accepted, with this item being worded as follows:</p> <p><i>'The buildings of Classes II, III and IV, as defined in section 4.2.5 of Annex 1, must not be constructed in the vicinity of tectonic faults classified as seismically active according to the state of existing knowledge. For these purposes, it will be considered that a fault is close to the projected building if, in the event of an earthquake associated with said fault, the breakage of the fault or the permanent deformation of the ground around it may affect the construction. An additional distance should be considered, as a safety margin, in order to take into account the uncertainty when it comes to mapping the fault as regards the cartographic scale used.'</i></p>

	Raquel Martín Banda Ivan Martín Rojas José Jesús Martínez Díaz Eulàlia Masana Closa María Ortuño Candela Hector Perea Way José Luis Sánchez Roldán			
The whole document	IGME-Ana María Alonso Zarza and Rosa María Mateos Ruiz	<p>1-Regarding the consistent use of the term active fault, NCSR-22 employs up to 9 different denominations across all its annexes. To avoid confusion in the application of the standard, it would be desirable to homogenise the terminology used. To this end, we would simply advise using the terms 'potentially active fault' or 'active fault'.</p> <p>2- In relation to the definition of the time period for which a fault is to be considered to be active or potentially active, it would be desirable for this to appear at the start of the document, in Annex I 'General Rules'. However, this definition is not found until the Annex II 'Bridges' and, in particular, in the Annex V 'Foundations'.</p>	YES, PARTIALLY	<p>The definition and characteristics of 'potentially active failure' are incorporated in section 1.5.2 of Annex 1. The wording is ultimately as follows:</p> <p><i>'potentially active fault: Fault that meets any of the following requirements:</i></p> <ul style="list-style-type: none"> • <i>Its average slip rate is equal to or greater than 1 mm/year.</i> • <i>There is evidence of a rupture or cosmic deformation in the surface of the ground over the past 129 000 years (from the beginning of the Upper Pleistocene, to</i>

				<p>the present day).</p> <ul style="list-style-type: none"> • It has associated seismic activity attested by the instrumental seismological record, or deduced from historical, archaeological or geological information, always within the previous 129 000 years <p>NOTE The terms 'potentially active fault' and 'seismically active fault' are used in this Standard without distinction.</p>
The whole document	IGME-Ana María Alonso Zarza and Rosa María Mateos Ruiz	<p>3-The correct application of the NCSR-22 requires, in many cases, knowing the distance of the infrastructure to the active faults in the surrounding area. It is of great interest and importance to have nationwide mapping where faults active since the Upper Pleistocene are identified as well as potentially referring to the distance of the faults to the infrastructure in question. Since 2010, the IGME has developed and maintained a map and database of faults with geological evidence of activity during the Quaternary period. Notwithstanding studies to be performed based on the importance of the infrastructure, this database could serve as a starting point for locating, within the series of faults active during the Quaternary, those with activity since the Upper Pleistocene</p>	YES, PARTIALLY	<p>In this regard, points 4.1.2 (1) and 4.1.2 (2) of Annex 5 have been amended on the basis of two previous observations, with the following wording:</p> <p><i>'(1) Buildings of Classes II, III and IV, as defined in section 4.2.5 of Annex 1, must not be constructed in the vicinity of tectonic faults classified as seismically active according to the state of existing knowledge. For these purposes, it will be considered that a fault is close to the projected building if, in the event of an earthquake associated with said fault, the breakage of the fault or the permanent deformation of the ground around it may affect the construction. An additional distance should be considered, as a safety margin, in order to take into account the uncertainty when it comes to mapping the fault as regards the cartographic scale used.</i></p> <p><i>'(2) The absence of movements in the Upper Pleistocene (last 129 000 years) can be used as a criteria for identifying non-active faults for most structures that are not critical to public safety.</i></p> <p>NOTE A failure can be classified as seismically active if a specific investigation is certified by a</p>

				<i>competent public administration</i>
The whole document	IGME-Ana María Alonso Zarza and Rosa María Mateos Ruiz	<p>4- It seems appropriate that the active faults identified, in addition to spatially located, include the maximum potential magnitude of the earthquake they can generate. (...)</p> <p>It should be noted that NCSR-22 refers to two different scales of magnitude: moment magnitude (M_w) and surface wave magnitude (M_s). Although for the size of the magnitudes cited -6.5- both scales are very similar, it would be ideal to standardise the magnitude scale referred throughout the document to the M_w, which is used in the seismic characterisation of faults.</p>	YES	<p>On account of a previous observation, the following amendments have been made:</p> <p>Inserted in 1.6.2 of Annex 1, (among the definitions of E_d and N_{SPT}):</p> <p><i>'M_w Earthquake Magnitude, Moment Magnitude Scale Used'</i></p> <p>And M_s entry in section 1.6.9 has been removed to define the magnitude of the earthquake.</p> <p>All occurrences of M or M_s from this Annex 1, referring to magnitude of an earthquake, are changed to M_w.</p> <p>This observation is also verified in the rest of the annexes, and the same correction process is performed, where appropriate.</p>
The whole document	IGME-Ana María Alonso Zarza and Rosa María Mateos Ruiz	<p>Summary and conclusions (...)</p> <p>c- The need for official maps that identify, locate and characterise the country's potentially active faults. This mapping is paramount when it comes to obtain the distance parameters of the active fault to the infrastructure, as well as the magnitude of the potential earthquake that the fault may generate. (...)</p> <p>d- In relation to the previous point, the CN IGME-CSIC offers the use of its QAFI database, which could be adapted to the specific requirements for the proper management of the NCSR-22.</p>	COMMENT	<p>It is proposed that this information be included in comments on a future commented edition of the Standard,</p> <p>These comments, indicating the availability of such mapping or IGME databases, once adapted will be included after the definition of potentially active fault in section 1.5.2 of Annex 1.</p> <p>In addition, it should be included that this database does not exempt further studies on such faults-</p>

APPENDIX A.

RESPONSE TO REPEATED COMMENTS:

Comments:

- 1 The preparation of a new Spanish Earthquake-Resistant Standard through reproduction of Eurocode 8 replacing references to other Eurocodes with references to Spanish structural codes results in the mixture of regulatory bodies of different origin, thus breaking technical coherence and can lead to situations that compromise security.*
- 2 Therefore, European seismic legislation (Eurocode 8, UNE-EN-1998) should be adopted by direct reference in its entirety, without changes or replacements of references to other Eurocodes by references to national regulations. The 'direct referral' technique adopted in other European countries to incorporate Eurocodes into their national legislation is the only way to ensure the internal consistency of the set of rules applied, as well as harmonisation with Europe.*
- 3 It is vital that the NCSR-22 Earthquake-Resistant Construction Standard incorporates an automatic update clause so that as soon as UNE publishes the second generation of Eurocodes and their corresponding National Annexes are available, the second generation of Eurocode 8 enters immediately into force.*
- 4 The training and skills of structural engineering professionals must be focused on European criteria and regulations, meaning that as part of our teaching, the reference regulations are the Structural Eurocodes.*

Answers:

The draft NCSR-22 standard fully adopts Eurocode 8 (UNE-EN 1998), by transcribing it and adapting it to the specific regulations in force in Spain, including its National Annex in the appropriate sections.

The answers to the points listed in the above common comments are provided below:

1- Regardless of the legal aspects that will be detailed below, **the reference to current Spanish regulations generates a document that is technically consistent**, with an analysis of these references having been performed. This system has been used in other regulations, such as the Structural Code, in which the aspects included within the competence of the proposing committees have been developed and has been referred to other technical regulations in other cases.

Furthermore, the transcription process carried out fully maintains the criteria and concepts given in Eurocode 8. In turn, some corrections of errors or translation errors have been made, in relation to the tenses used and the direct inclusion in the text of the contents of the National Annexes (Parameters of National Determination and Complementary Non-contradictory Information).

2- The use of a direct reference to the Eurocodes in this draft legislation **presents several drawbacks, but mainly some legal problems**. These problems, which are described below, have been corroborated by the Opinion of the Council of State No 1083/2019, which assessed the incorporation of different UNE-EN standards relating to Eurocodes into the Structural Code, in a manner similar to that contained in this draft regulation.

- Direct referral to Eurocodes involves adopting not only the six parts of Eurocode 8 of the 'Scope' of the Standing Committee on Earthquake-Resistant Standards, but other Eurocodes, as some are cited in EC8 (e.g. Eurocode 2, which sets out the requirements for the concrete structure project, Eurocode 1, which sets actions in structures, or Eurocode 5 for wooden structures) and many of them are interrelated.

In some of these cases, different laws (e.g. Building Planning Act, Road Law, etc.) and different regulations (Structural Code, Technical Building Code, Instruction on actions to be considered in the road bridges project, or Instruction on actions to be considered in the project of railway bridges) would be infringed, since the latter regulate aspects considered in other Eurocodes cited in EC8.

In addition, all would entail a proposal being undertaken that would go beyond the scope of the powers assigned to the aforementioned Commission (and which correspond to other administrative bodies).

In this regard, the Opinion of the Council of State No 1083/2019 indicates that when these circumstances are present, direct referral is not possible:

'The Council of State must state, finally, that it would not have been contrary to the legal system to refer to all or some of the UNE standards that reproduce the Eurocodes, establishing their general or partial obligation, with the limitations indicated above that they can neither infringe legal determinations nor exceed the areas specific to the referring regulatory standard. However, this option would require the modification of some legal rules and numerous sectoral technical regulations, other than the general ones relating to steel, concrete and mixed structures –Technical Building Code, road legislation, public works, etc. – so that the proposed legislative instrument – Royal Decree – would be insufficient because of the range to address it.

3- The adoption of a clause that automatically adopts the updates to the UNE standards of Eurocodes, voluntary rules adopted by the European Committee for Standardisation (CEN), would imply amending the content of the Royal Decree, and therefore allow a private body to exercise regulatory power.

Regulatory authority is regulated (Article 97 of the Constitution and ratified by Law 50/1997 of 27 November 1997 on the Government); Law 39/2015 of 1 October 2015, on the common administrative procedures of the public administration; and in Law 40/2015, of 1 October 2015, on the Legal System applicable to the Public Sector) and endorsed by different opinions of the Council of State, such as number 153/2018, of 22 March 2018, and number 930/2018, of 13 December 2018. Based on these, it can be concluded that a Royal Decree must be amended by a rule of equal rank, or only in some cases, by Ministerial Order.

On the other hand, the current earthquake-resistant standard needs an update that would not allow to wait for the future generation of Eurocodes, in its entirety, to be

available, since this process, according to information from CEN could be completed by 2028. When this happens, it would be necessary to take into account this second generation of Eurocodes and improvements to the state of knowledge that this will lead to.

4- The process followed and the final result obtained maintains the criteria considered in the European legislation and does not differ substantially from this one, so it should not be an obstacle to university education and training if the intention is to structure it around voluntary European regulations.

APPENDIX B.

RESPONSE TO COMMENTS FROM ROSARIO CORNEJO ARRIBAS AND ÁLVARO GRILL ALKAID

First, each of the 14 points or arguments contained in the allegation are answered in detail, before finally concluding with a reply to the conclusion.

1. NCSR AUTHORSHIP:

It should be declared that the NCSR can be traced to Eurocode 8 and remove the section reproduced at the start of this section.

RESPONSE:

CPNs agreed at its meeting on 20 November 2014 that: *'the update of the earthquake-resistant regulations is carried out by the adoption of the Eurocode-8 and its corresponding National Annex (...).'*

At the subsequent meeting of 23 June 2016, the CPNs adopted the National Annex of the six parts of the EC-8 and agreed on the technical content of a draft Royal Decree for the adoption of the Standard of Earthquake-Resistant Construction.

The present procedure is the continuation of this process initiated previously, and it is therefore the CPNs who ultimately draws up such technical regulations.

The Royal Decree does not assign the authorship of the document to the CPNs, rather it is Royal Decree 518/1984, of 22 February, which reorganises the composition of the Permanent Commission on Earthquake-Resistant Standards, which indicates what are the functions of the Commission, among which is 'Study, elaborate and propose earthquake-resistant rules applied to the fields of engineering and architecture'.

In any case, we propose amending the third section of the draft Royal Decree as follows:

The Standing Committee on Earthquake-Resistant Standards, in the exercise of its functions, has drawn up a new Earthquake-Resistant Construction Standard that replaces the aforementioned standards, incorporating the most relevant aspects of European regulations for the calculation of structures, in accordance with the procedures established in the Structural Eurocodes and expanding their content with more structural typologies. The new standard establishes the technical conditions to be met by building structures and civil engineering works, so that their behaviour, in the face of seismic phenomena, avoids serious consequences for people's health and safety, avoids economic losses and promotes the maintenance of basic services for society in cases of high intensity earthquakes.

2. IDENTIFICATION OF THE TECHNICAL PAPER WRITER:

'The identification and dissemination of paper affiliation is requested'.

RESPONSE:

The editorial process of adaptation and correction of the NCSR-23 has been carried out by a working group composed of staff from the DG. of the National Geographical Institute (IGN) and the Technical General Secretariat (SGT) of MITMA.

Occasionally, some technical consultation has been carried out with another body or expert in the field, including in this regard some of the interactions carried out with the Commission's members.

3. INTELLECTUAL PROPERTY:

'Refrain from proceeding with the processing of the NCSR until written authorisation is available from CEN for the reproduction of the standard, or a report from the State Legal Service in which, having regard to Eurocode 8 and the NCSR proposal, it is indicated that there is no infringement of intellectual property law'.

RESPONSE:

The text on the third page of the standard is: '© year CEN. Reproduction rights reserved to CEN Members'. Previously, on the second page, it says '© UNE year'. That is, the copyright in Spain corresponds to UNE.

The Structural Code has been developed using the same technique, without any problems being raised by UNE. In the case of NCSR-23, no claim has been received from UNE during official public information; in addition, the secretariat of this Commission has these rules thanks to the fact that UNE has voluntarily given them to us, knowing what they were going to be used for.

4. ADDITIONAL PROVISION IN THE ROYAL DECREE:

'Include an Additional Provision equivalent to the DA2 of Royal Decree 470/2021, which expressly recognises the validity of all Eurocodes for the project of structures in seismic zone'.

RESPONSE:

The Report of the Regulatory Impact Analysis of the Structural Code, in relation to this second additional provision, states that: 'This provision provides for a potential alternative application of Article 3 of the Structural Code to projects developed for public sector bodies or entities pursuant to the structural Eurocodes within the scope of this Code (these Eurocodes are those listed in Article 3.b thereof, which includes the indication of the version in force at the time of the adoption of this Code)...'. The interpretation made by the SGI members of this second additional provision does not correspond to its actual meaning, included in the MAIN, a document accompanying the regulatory draft for adoption by the Council of Ministers and published on the Government's Transparency portal (<https://transparencia.gob.es>)

In the draft Royal Decree of the draft Construction Standard NCSR-23, a single additional provision was initially included, similar to that adopted with the Structural Code. This additional provision only supported, as does that of the Structural Code, use of Eurocodes rules covered by the regulation itself. The opinion of the Council of State does not allow the scope of the regulation to be extended, either directly, or through additional provisions. It has already been well explained that the earthquake-resistant Construction Standard cannot regulate issues outside its competence, and what is being proposed in that writing is that this new Standard of Earthquake-Resistant Construction allows the use of other Eurocodes instead of the current regulations (structural Code, Technical Building Code, etc.). Apart from the fact that it is contrary to the aforementioned Opinion of the Council of State and the distribution of competence within the Administration, it does not form part of the functions of this Commission to regulate the scope of the Structural Code (design, construction and maintenance of concrete, steel and mixed structures of concrete and steel), the Technical Building Code (actions to be considered in buildings, wooden and brick structures, building foundations), etc.

Finally, given the impossibility of reaching an agreement on this point, that initially proposed additional provision was deleted by agreement of the CPNS.

5. REFERENCES TO THE INSTRUCTIONS FOR ACTIONS ON ROAD AND RAIL BRIDGES, IAP-11 AND IAPF-07:

'Delete any reference to IAP and IAPF, including in Comments'.

RESPONSE:

The articulation of the draft of NCSR-23 does not contain any reference to the IAP-11 or IAPF-07 instructions.

Mentions to the regulation of actions involving bridge were only in an initial draft with Comments, the objective of these being to structure the current regulatory framework.

6. REFERENCES TO OTHER EUROCODES CONTAINED IN UNE-EN 1998:

'In the event that it is not included by direct reference to Eurocode 8, incorporate the 435 references to other Eurocodes that have been replaced by other types of non-equivalent referrals directly into the NCSR proposal.'

RESPONSE:

The incorporation of all references to other Eurocodes would imply, on the one hand, adopting aspects that fall outside the competence of the Commission, and on the other would regulate aspects already regulated by other bodies (such as concrete, steel, and mixed structures, actions in building and bridges, among others).

In this regard, the Opinion of the Council of State No 1083/2019 indicates that this situation makes a direct reference of the rules impossible:

'The Council of State must state, finally, that it would not have been contrary to the legal system to refer to all or some of the UNE standards that reproduce the

Eurocodes, establishing their general or partial obligation, with the limitations indicated above that they can neither infringe legal determinations nor exceed the areas specific to the referring regulatory standard. However, this option would require the modification of certain rules of legal status and numerous sectoral technical regulations, other than those relating to steel, concrete and mixed structures – Technical Building Code, road legislation, public works legislation, etc. – so that the proposed regulatory instrument – Royal Decree – would be insufficient because of the range to address it.

In relation to the examples cited:

- **'Example C.'**

The NCSR-22 proposal replaces references to UNE-EN 1992 with references to the Structural Code. This Code contains in its articulate a procedure for calculating the anchor lengths of the reinforcements different from the UNE-EN 1992 method. This procedure allows reductions in the anchor lengths of the bars in the concrete that do not guarantee the plastification of them in the areas of 'plastic joints', which is a key aspect in the behaviour of the structures against earthquakes...

RESPONSE:

The Structural Code includes two ways to determine the anchor length of passive reinforcement. If the characteristics of adhesion of the bar are certified based on a beam test, pursuant to the provisions of Article 34.2 of this Code, the provisions of Article 49.5 will apply. However, it is also stated that if the bar adhesion characteristics are checked based on the geometry of corrugates or graphs, the anchor lengths set out in Annex 19 (Eurocode 2) will apply. Although each method gives rise to different anchor lengths depending on the diameter of the bars and the anchoring conditions, both procedures are valid, being adopted by the Structural Code.

In the seismic case, as provided for in Article 47 of the Structural Code: 'For concrete structures that may be subjected to the effects of an earthquake, the corresponding specific regulations will apply'.

Therefore, once the new Earthquake-Resistant Standard is adopted, it must be in accordance with the provisions thereof. And in particular, with regard to reinforcement anchorage and splice lengths, section 5.6 of Annex 1 of NCSR-23 (5.6 – Provisions for anchorages and splices) will be complied with, which sets out specific criteria for anchorages subject to seismic loads.

Section 5.6.1(1) of Annex 1 of NCSR-23 originally provided: '*For the construction details of the reinforcements, the section 8 of Annex 19 of the Structural Code applies, together with the additional rules indicated in the following sections*'. This point has been modified after the review of the comments received during the process of public information, finally reading as:

'For the construction details of the reinforcements, section 8 of Annex 19 of the Structural Code applies, together with the additional rules indicated in the following sections. Alternatively, the reinforcement anchorage and splice lengths may be obtained in accordance with Article 49.5 of the Structural Code (in this case, section 5.6.1(3) and section 5.6.2.1 (2) would not apply).'

- **'Example D.'**

The proposal under NCSR-22 (clause 4.1.2, Annex 2) specifies the values of the combination coefficients and, simultaneously, refers to the Instructions for Actions in Spanish Bridges, when the values included in them for these coefficients are different: $\psi_2=0.3$ for high-traffic bridges in the NCSR-22 proposal compared to $\psi_2=0$ in the Spanish Regulation for Actions. In other words, if the NCSR-22 proposal were adopted, there would be a contradiction between two Spanish regulations in an aspect of considerable importance in the sizing of bridges in seismic zones. (In Eurocodes this coefficient is collected only on one site and only one reference is included in the other Eurocodes).'

RESPONSE:

The reference, in fact, is to the regulations in force.

In this section (4.1.2 (4) of Annex 2), the full content of the EC-8 National Annex has been moved. The intention pursued with the adaptation of this section has been, on the one hand, to incorporate the provisions of the National Annex of the EC-8; and, on the other hand, adapt to the current regulatory scenario, in which NCSR-23 must be framed as long as IAP-11 and IAPF-07 are not repealed and replaced, avoiding a contradiction in their provisions. The objective is for the verification to be carried out pursuant to both regulations (NCSR-23 and the corresponding instruction for actions on bridges).

The opposition has given rise to a change in this section, which is finally worded as follows:

(4) 'Quasi-permanent values of variable actions should be taken as being equal to $\psi_{2,1} Q_{k,1}$, where $Q_{k,1}$ is the characteristic value of the traffic load.

For the purposes of the application of this Earthquake-Resistant Standard, the combination coefficients, $\psi_{2,1}$, for the seismic situation will be adopted according to the following values:

- Pedestrian passageways and bridges, $\psi_{2,1} = 0$.*
- Road or rail bridges with normal traffic, $\psi_{2,1} = 0$.*
- Bridges with high traffic (for uniform overload only):*
 - Road bridges, $\psi_{2,1} = 0.2$.*
 - Railway bridges, $\psi_{2,1} = 0.3$.*

Note 1 Road bridges with high traffic conditions can be considered as equivalent to those of motorways and other roads of national importance. Rail bridges with high traffic conditions can be regarded as equivalent to intercity rail links and high-speed lines.

Note 2 Without prejudice to the foregoing, the verification must also be carried out considering the combinations of actions provided for in the specific regulations in force'.

- **'Example E.**

The formulation of thermal action with Spanish regulations results in values very much on the side of insecurity compared to those defined in UNE-EN 1991-1-5. The NCSR-22 proposal, which replaces the reference to UNE-EN 1991-1-5 with a reference to IAP-11/IAPF-07, results in the undervaluation of the seismic situation of thermal actions, which has an important effect on the sizing of certain structural elements.

RESPONSE:

In this case, again, the requirements established in the regulation are respected. In any event, the determination of the thermal action does not fall within the competence of this Commission.

In the case of thermal action, only the combination coefficient values are set out in NCSR-23 for cases in which seismic action is concomitant. For example, in 2.3.6.3(2) of Annex 2, the value of the combination coefficient is provided for the quasi-permanent value of the thermal action ($\psi_2=0.5$) for the calculation of slacks.

On the other hand, J.1(2) of Annex 2 (Variations of the calculation properties of the insulators) includes the full content of the EC-8 National Annex.

In any case, to avoid ambiguities, the decision has been made to use the concrete value of ψ_2 , without references to other regulations. In both cases, the value $\psi_2=0.5$ is consistent with the Eurocode framework.

7. RESPONSIBILITY OF THE AUTHOR OF THE PROJECT IN CASE THE EUROCODES ARE APPLIED:

'Remove from the allocation of responsibility to the project author in case the Eurocodes are applied in the project, in contradiction with European legislation, from the NCSR proposal.

RESPONSE:

NCSR-23 does not hold the project author liable for the use of Eurocodes; in all aspects for which there is no applicable regulation and exceeds the competence of this regulation, and where therefore the author of the project can use what he deems appropriate, the author of the project, in those cases, is responsible for the decision taken, as this is in a non-regulatory environment. Even so, by mentioning the corresponding Eurocodes, it is given a prominent place within the voluntary standards. In addition, it is once again insisted that at no time is the use of Eurocodes deemed appropriate being inhibited. Finally, neither the European Commission nor the European Committee for Standardisation (CEN) assumes any responsibility for the use of Eurocodes, so it is considered necessary to warn which agent it is taking over when using them outside the regulatory scope.

There is a misinterpretation in the second additional provision of Royal Decree 470/2021 adopting the Structural Code, since the justification given in the letter omits a fundamental part (emphasised below), in which it expressly recognises the validity of all Eurocodes ('the EN 1990-1999 series standards') **which relate to the scope of this**

Code and in the version in force at the time of this Code was adopted as a way of complying with the Structural Code. In short, that second additional provision recognises the application of the 15 standards referred to in Article 3.b of the Structural Code, but in no case of the rest, not included in its scope; in doing so, it would be contrary to what was stated in the Opinion of the Council of State on the extension of the scope of the regulation and the violation of the national regulatory framework. This misinterpretation of the additional provision has already been explained in the response to submission 4.

The letter states that: In any event, it is the European Commission itself which states that *'Member States should adopt Eurocodes in relation to structural products and construction works, and recognise that the use of such Eurocodes gives rise to a presumption of conformity with the essential requirements referred to in Directive 89/106/EEC'* (Official Journal of the European Union, 19 December 2003).

In this regard, Spain has adopted the Eurocodes, since they are published as UNE-EN standards and, moreover, within the scope of the Earthquake-Resistant Commission, it assumes the content of Eurocode 8 as regulatory, going well beyond what the European Commission establishes.

8. PROGRESS MADE WITH EARTHQUAKE-RESISTANT ENGINEERING OVER THE PAST TWO DECADES:

'In the event that it is not regulated by direct reference to Eurocode 8, it is requested to incorporate into the NCSR's proposal the progress achieved by earthquake-resistant engineering in the last two decades.'

RESPONSE:

In the conclusion of their letter, they indicate as a proposed solution '...to draft the Spanish earthquake-resistant legislation by reference to UNE-EN 1998 together with its National Annex, with the date of the regulation currently in force...'. That being his proposal, it is not understood that in the second section of this point eight it is said that 'It is considered unacceptable to approve a Spanish seismic standard that does not reflect the advances that have been made in earthquake-resistant engineering in the last two decades...'. These are contradictory sections (when referring to Eurocode 8 it is completely correct, but if it is transcribed, it is an obsolete text), although we understand that what is valid is what they present in conclusions, i.e., that the seismic rule must be adapted to Eurocode 8, as is also what the CNPS adopted at the previous meeting.

Evidently in the technical field there are continuous advances in knowledge, but today this is the most modern standard in relation to seismic action. It is true that a new one is being worked on, but it will not be available in the coming years; when it is, we will have to work on incorporating it, but currently it is urgent to update the earthquake-resistant standard, which is very obsolete.

These rules, adopted between 2004 and 2006, have subsequently undergone changes to adapt them to the state of knowledge, between 2009 and 2013. Therefore, they have indeed experienced updates during this time.

9. NEED FOR A STUDY SUPPORTING THE TECHNICAL CONTENT OF THE NCSR:

In the event that it is not regulated by direct reference to Eurocode 8, a study should be undertaken by specialists in seismic engineering that technically validates the content of the NCSR proposal including the change of regulatory references before continuing with its processing.

RESPONSE:

The comments submitted are not justified. There is no difference between referring to Eurocode 8 and transcribing it, so if there is no problem of reliability of the structure in the referral, there can be no problem in the transcript either.

10. NON-COMPLIANCE WITH THE AGREEMENTS ADOPTED BY CPNS IN 2014 AND 2016:

'The NCSR proposal does not comply with the principle of direct referral and therefore contravenes the unanimous agreements adopted at the CPNS.'

RESPONSE:

As already explained at the CPNS meeting, the January 2020 Council of State Opinion invalidates the Commission's previous technical decision, as it is not legally possible to carry it out. The amendment submitted by the secretariat reflects the technical content adopted by the Commission at previous meetings, and makes a legally viable proposal, which is what the Commission is currently voting on.

In no case did the CPNS approve in previous meetings change the existing regulations (Technical Building Code, Instructions EHE-08 and EAE, etc.), because it also had no competence to do so. It is not appropriate for the Commission to propose a regulation on all those aspects outside it.

11. FEASIBILITY OF DIRECT REFERRAL TO EUROCODES IN SPANISH REGULATIONS:

'The decision to forward or reproduce the Eurocodes in a Spanish regulation is therefore a technical and non-legal issue. Obviously, the wording of the NCSR by reference to Eurocode 8, will imply the adjustment of the rest of the Spanish structural regulations, but this need for readjustment occurs whenever one of those interrelated regulations is updated. The situation from this point of view is the same whether it is referred or reproduced'.

RESPONSE:

In relation to the report of the State Counsel of March 2019, prior to the opinion of the Council of State of January 2020, it should be noted that it also concludes the following:

'Where the use of referrals is used, it is necessary to establish rules, etc. which cover, inter alia, the Technical Standard applicable in the event of reform, repeal, or change of

name, or in respect of references contained therein to other Standards to which no reference has been made in the general provision. These rules should be aimed at achieving the necessary clarity in relation to the provisions of the Technical Regulation, as well as the certainty of the applicable law as a requirement of the principle of legal security. In other words, the referral, when possible, is not immediate, but must analyse its fit, among others, to the principle of legal security.

In any case, the opinion of the Council of State is very clear and leaves no room for doubt in its interpretation: under the current legal framework, such a referral is not possible.

Finally, the extraction of random sections from the Opinion of the Council of State and the report of the State Advocacy does not reflect the meaning of these documents.

12. EXPLICIT PROHIBITION ON THE MIXING OF REGULATORY BODIES:

'The three pages of the Portuguese regulation must be analysed to apply the same solution in Spain that, in such an intelligent way, has been adopted by our neighbour'.

RESPONSE:

References to the current Spanish regulations contained in the Earthquake-Resistant Construction Standard generate a document with technical consistency, and an analysis of these references has been carried out. This system has been used in other regulations, such as the Structural Code, in which the aspects included within the competence of the proposing committees have been developed and has been referred to other technical regulations in other cases.

The above limitation of the document drawn from the Portuguese regulation would not apply to the situation in Spain, inter alia due to differences in the regulatory framework of the two countries.

13. DEADLINE FOR SUBMISSIONS:

RESPONSE:

The current Earthquake-Resistant Standard (NCSE-02 and NCSP-07) needs an update. Given the existing agreement and consensus reached at the previous meetings of the CPNs, as regards Eurocode 8, it seems reasonable and consistent not to delay this process in excess.

The content of NCSR-23 is that of Eurocode 8, which is therefore already a document known to experts, as the allegation indicates.

In March 2022, the Prior Public Consultation of the NCSR-23 was carried out, where it was already indicated what the contents of the same would be.

The processing of this NCSR-23 is complying with all the formalities established in Spanish legislation, including deadlines.

14. NEED FOR CONSENSUS IN THE SPANISH TECHNICAL COMMUNITY:

'Do not continue with the processing of the NCSR until the necessary consensus is reached and the technical comments that have been expressed in different areas in recent weeks are addressed, many of which are reflected in this letter'.

RESPONSE:

The proposal raised on this point should be regarded as a party opinion. There is no reliable demonstration of a lack of security in the proposed regulation, nor is there widespread disagreement about it in the technical community. While recognising that this Earthquake-Resistant Construction Standard will always be susceptible to improvement, we believe that the proposal expressed aims to keep current standards in place longer.

CONCLUSIONS

'It is considered that the appropriate way to resolve all the problems affecting the NCSR proposal, set out in this letter, is to draft the Spanish earthquake-resistant legislation by direct reference to UNE-EN 1998 together with its National Annex, with the date of the regulation currently in force and with the possibility of updating the version by ministerial order.

With this solution, which, as indicated above, is perfectly viable from the legal point of view, solves the problem introduced in the NCSR proposal by changing the system of regulatory references and would greatly facilitate the updating of the Spanish seismic standard from now on.'

RESPONSE:

The submission of observations only proposes adopting an Earthquake-Resistant Building Rule by reference to Eurocode 8, without any alternative solution to the proposed text. Since the opinion of the Council of State is very clear on this issue, i.e. that such a referral is not possible within the current regulatory framework, such a request cannot be granted.

The proposed step with the new Earthquake-Resistant Construction Standard is that the Structural Code and the new standard are fully adapted to Eurocodes. So far, there has never been a security problem and it is not justified why there may be now. It should be justified which of the proposed changes could pose a technical problem and for what reason, in order to be able to correct it.

**DRAFT ROYAL DECREE ADOPTING THE
EARTHQUAKE-RESISTANT CONSTRUCTION
STANDARD NCSR-23**

REGULATORY IMPACT ANALYSIS REPORT

ANNEX III

**ASSESSMENT OF THE ECONOMIC IMPACT OF THE PROJECT
EARTHQUAKE-RESISTANT CONSTRUCTION STANDARD:**

**‘STUDY OF FUNDAMENTALLY
ECONOMIC IMPACTS THAT APPLYING THE
EUROCODE WOULD HAVE IN 1998 PART 1 (BUILDINGS) AND PART 2
(BRIDGES) IN SPAIN’**