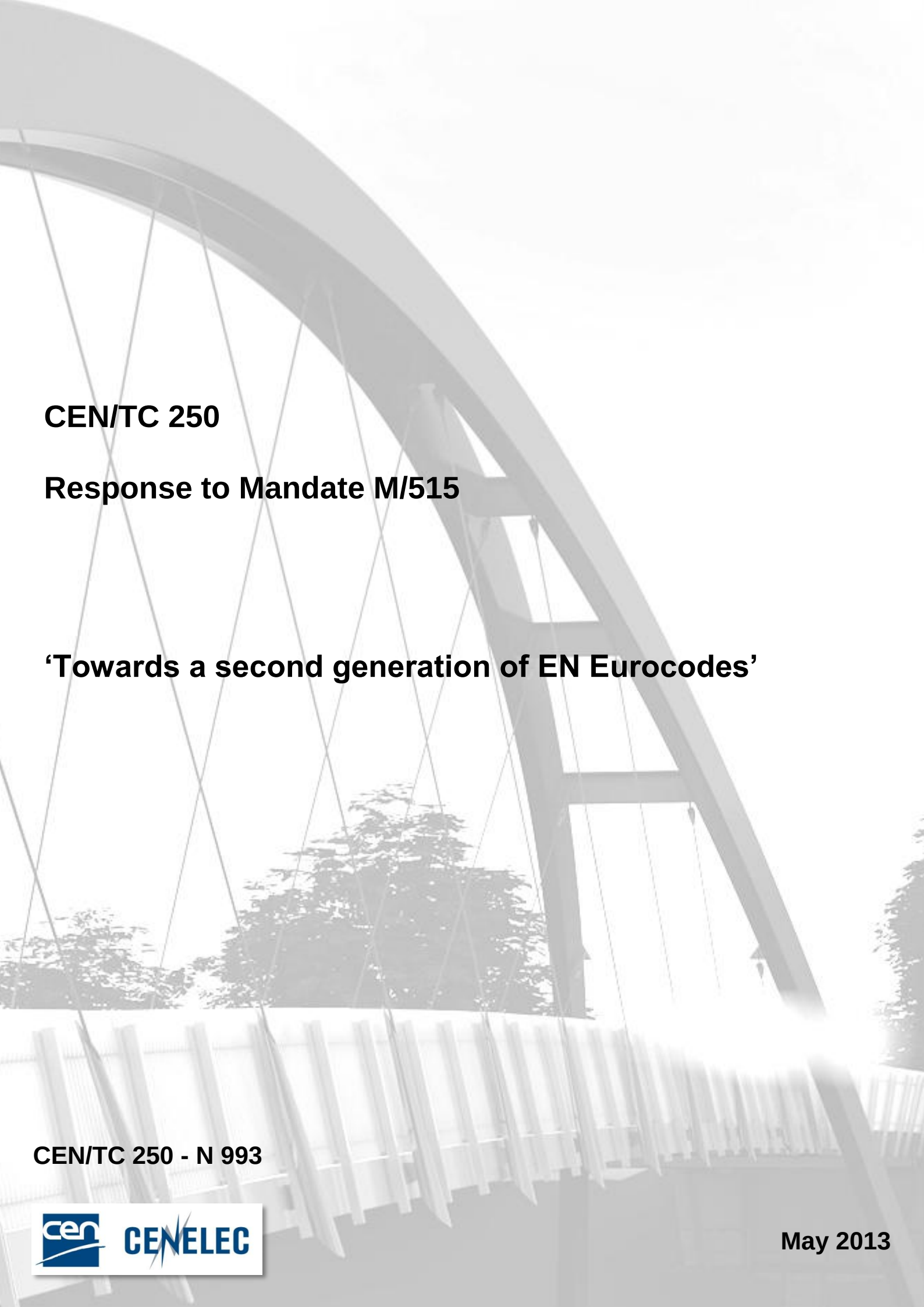

CEN/TC 250

Response to Mandate M/515

‘Towards a second generation of EN Eurocodes’

CEN/TC 250 - N 993

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Executive Summary

The Eurocodes enable the design of building and civil engineering works, and comprise 10 Standards in 58 parts. When they were published, prior to 2007, the first generation of EN Eurocodes were the most comprehensive and technically advanced suite of standards for structural and geotechnical design in the world.

Their development was a tremendous achievement and represented the culmination of over 30 years collaborative effort. Their impact has been considerable, affecting the day-to-day work of around 500 000 professional engineers across Europe.

In May 2010, the European Commission (EC), Enterprise and Industry Directorate-General, sent Programming Mandate M/466 EN to CEN concerning the Structural Eurocodes. The purpose of this mandate was to initiate the process of further evolution of the Eurocode system, incorporating both new and revised Eurocodes, and leading to the publication of the second generation of EN Eurocodes. CEN replied to this mandate in June 2011.

In December 2012, the EC sent a further Mandate M/515 EN, inviting CEN to develop a detailed standardisation work programme using the reply to mandate M/466 as a basis. This document is the reply to Mandate M/515 EN. It sets out TC 250's proposed work programme together with additional supporting information. Over 1000 experts from across Europe have been involved in the development and review of this document.

The objectives and intended impacts of the work are defined. It is widely recognised that long-term confidence in the codes requires the Eurocodes to evolve in an appropriate manner. Specifically the proposed work programme focuses on ensuring the standards remain fully up to date through embracing new methods, new materials, and new regulatory and market requirements. Furthermore, it focuses on further harmonisation and a major effort to improve the ease of use of the suite of standards for practical users.

Beneficial impacts of the work programme are presented ranging from improved efficiency and targeted extension of scope, to increased user confidence and enhanced sustainability in construction. With the European market for design services in the construction sector being approximately 75€Billion, it is clear that even very modest efficiency savings will yield very substantial monetary benefits for public and private sector clients.

The approach to the execution of the mandate is presented. Guiding principles used in the development of this response are set out, together with a detailed explanation of how a series of specific issues will be dealt with. The TC 250 work programme encompasses all the requirements of M/515, supplemented by requirements established through extensive consultation with industry and other stakeholders. As such the overall work programme includes elements for which funding is sought from the EC and elements that will be wholly funded from other sources, principally industry.

The work programme is structured to comprise four overlapping phases. In this response a complete overview of all phases is included, with further detail provided for those tasks in Phase 1 that are expected to form the basis for initial contractual discussions with the EC.

Details are provided of the organisational structure for the execution of the mandate and the means by which effective coordination will be assured. To maximise the benefit derived from the extensive existing network of active stakeholders, the organisational structure has been based upon the current TC 250 operating model.

The TC 250 work programme is presented in detail as Annex 1. It comprises 77 discrete tasks, all of which will be undertaken under the direction of one of TC 250's existing Sub-committees, Working groups or Horizontal groups. A summary of the deliverables for each task is provided, and a mapping between the explicit requirements of M/515 and the TC 250 work programme is given.

TC 250 is committed to the successful development of the second generation of EN Eurocodes, and seeks the support of the EC in helping to make this possible.

1 Introduction and context

1.1 Terms of reference

In May 2010, the European Commission (EC), Enterprise and Industry Directorate-General, sent the Programming Mandate M/466 EN to CEN concerning the Structural Eurocodes. The purpose of this mandate was to initiate the process of further evolution of the Eurocode system, incorporating both new and revised Eurocodes.

As the technical committee responsible for the preparation of European design rules for structures (Structural Eurocodes), CEN/TC 250 prepared a reply to M/466 on behalf of CEN that was issued to the Commission in June 2011.

In December 2012, the European Commission (EC), Enterprise and Industry Directorate-General, sent a further Mandate M/515 EN, inviting CEN to develop a detailed standardisation work programme using the reply to mandate M/466 as a basis.

This document is the reply to Mandate M/515 EN (hereafter referred to as M/515). It has been prepared by CEN/TC 250 supported by extensive consultation with stakeholders. It sets out the TC 250 proposed work programme together with additional supporting information.

At the Copenhagen Meeting of CEN/TC 250 in May 2013, this reply was unanimously approved for submission to CEN for transmission to the European Commission, as recorded in TC 250 Decision 315.

The structure of this response has been based on guidance received from CEN. Section 2 sets out objectives and intended impacts of the proposed work. Section 3 details the approach that will be undertaken for the execution of the mandate. The detailed work programme is presented in Annex 1 and illustrated diagrammatically in Annex 2. The proposed schedule and key milestones are presented in Annex 3.

1.2 Overview of the Eurocodes

The Eurocodes were developed to enable the design of structural construction works (building and civil engineering works) in order to comply with the Essential Requirement n°1 (mechanical resistance and stability) and partially Essential Requirement n°2 (safety in case of fire) and n°4 (safety in use) and to determine the performance of structural construction products.

All 10 of the existing EN Structural Eurocodes, in 58 parts, were published prior to June 2007. They comprise:

EN 1990	Eurocode:	Basis of Structural Design
EN 1991	Eurocode 1:	Actions on structures
EN 1992	Eurocode 2:	Design of concrete structures
EN 1993	Eurocode 3:	Design of steel structures
EN 1994	Eurocode 4:	Design of composite steel and concrete structures
EN 1995	Eurocode 5:	Design of timber structures
EN 1996	Eurocode 6:	Design of masonry structures
EN 1997	Eurocode 7:	Geotechnical design
EN 1998	Eurocode 8:	Design of structures for earthquake resistance
EN 1999	Eurocode 9:	Design of aluminium structures

Mandate M/515 will underpin the development of the second generation of EN Eurocodes. It encompasses the development of new standards and new parts of existing standards, and the incorporation of new performance requirements and design methods across multiple standards. It also emphasises the need to enhance the user-friendliness of the Eurocodes. In addition, M/515 requires a report to be prepared setting out how the Eurocodes should be adapted to account for the relevant impacts of future climate change.

2 Objectives and impacts

2.1 Objectives

The development of the first generation of EN Eurocodes was a tremendous achievement and represented the culmination of over 30 years collaborative work by experts, National Standards Bodies and regulators across Europe. When they were published, the Eurocodes were the most comprehensive and technically advanced suite of standards for structural and geotechnical design of buildings and civil engineering works in the world.

In accordance with CEN requirements, the deadline for the withdrawal of conflicting national standards was set as March 2010. As a result, over recent years, the Eurocodes have become the primary standards for structural and geotechnical design across Europe and in many other countries around the world. Their impact has been considerable, affecting the day-to-day work of around 500 000 professional engineers across Europe.

Long-term confidence in the codes is based on the ability of the structural Eurocodes to evolve in an appropriate manner. Over time they must embrace new methods, new materials, new regulatory requirements and new societal needs, fostering more economic and sustainable design and construction. Furthermore, it is vital that feedback from practical users is used to support improvements in the efficiency of the design process and enhance design outcomes, both during construction and throughout the life of the construction works.

Specifically, there is a need for the Eurocodes to be revised to incorporate improvements to the existing suite to reflect the state of the art and the needs of the market, particularly in relation to improving ease-of-use for practical users of the standards. Further harmonisation is needed, leading to a reduction in Nationally Determined Parameters and the number of alternative design methods. Enhancements in user-friendliness, without reducing applicability, will assist new entrants to the market and small and medium sized enterprises.

The over-arching objective for the work programme set out in this response is to address these challenges leading to the publication of the second generation of EN Eurocodes. This second generation of EN Eurocodes will support the ECs overall objectives regarding safety and the Internal Market. The revised and new Eurocodes will: encourage innovation, ensuring that the standards reflect and incorporate sustained market developments; take into account new societal demands and needs; and, facilitate the harmonisation of national technical initiatives on new topics of importance for the construction sector.

The proposed work programme will lead to additional structural Eurocodes and substantial additions to the existing ones. The new suite of Eurocodes will introduce requirements for the assessment, re-use and retrofitting of existing structures. Requirements for robustness will be strengthened and the practical use of Eurocodes for day-to-day calculations will be improved.

Under M/515, a new Eurocode on structural glass will be developed following a step-by-step procedure designed to ensure effective consultation and technical governance. Pre-normative work will be advanced on FRP structures and tensile surface structures, and M/515 may be amended in future to include the development of this pre-normative work into CEN Technical Specifications and subsequently full EN Eurocodes following the same step-by-step approach.

2.2 Relevance

The proposed work programme has been carefully designed to meet the objectives defined together with the specific requirements of M/515, and to do so in an efficient and coordinated manner. Evidence of this alignment is provided in Section 3. Importantly, as described below, the work programme supports a range of EC objectives and recommendations.

Commission Recommendation (2003/887/EC), on the implementation and use of the Eurocodes for construction works and structural construction products, recommends that Member States adopt the Eurocodes as a suitable tool for designing construction works and indicates the need for "continuous

efforts to maintain the Eurocodes at the forefront of engineering knowledge and developments in structural design … including new materials, products and construction methods". In addition, the Recommendation indicates the need to assess the variations of the Nationally Determined Parameters (NDPs) with the aim of further harmonisation.

Application of the Eurocodes in the EU Member States supports Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market ("Services Directive"). Disparities in design/calculation methods of the national building regulations constitute impediments to the free circulation of engineering and architectural services within the Community. The implementation of the Eurocodes should facilitate the provision of services in the field of construction engineering and architecture by creating conditions for a harmonised system of general rules. To ensure their application over time, the Eurocodes need to be updated to take into account developments on the market (new materials, products, methods, etc) and in accepted design methods and practices.

The application of the Eurocodes in the EU Member States supports Public Procurement Directives 2004/17/EC and 2004/18/EC entered into force on 31st January 2006. They state that contracting authorities must allow the use of European Standards, like the Eurocodes, in tenders falling within the remit of these Directives. Common design/calculation rules for infrastructure and other construction works facilitate the circulation of goods and persons in the internal market. Thus, they contribute towards creating conditions for extended competition for public contracts.

Outside the EEA, the Eurocodes are being implemented for use in a number of 'third' countries where, in addition to the direct benefits for the countries themselves, their use is expected to contribute towards an improved competitiveness of the European construction industry

2.3 Indicators

Performance indicators will be agreed with the EC. These will be documented, monitored and reported during the execution of the mandate. It is envisaged that the indicators will define specific targets and success measures that will be used to track progress.

2.3.1 Engagement with standardisation bodies, experts and other stakeholders

In recognition of the importance of the Eurocodes, there is already a very high level of engagement with NSBs, mirror committees, national authorities, international industry associations, individual experts and other stakeholders. Over 1000 experts from across Europe have been involved in the development and review of this response to M/515. Formal liaisons have been established with other CEN Technical Committees and key industry bodies.

CEN/TC 250 is committed to sustaining this excellent level of engagement throughout the execution of the mandate. Furthermore, CEN/TC 250 will work to ensure that industry is updated with the intended strategy and schedule for Eurocode development so that they can incorporate necessary decisions within their business planning. Particular attention will be paid to ensuring there is effective communication with small and medium size enterprises.

2.3.2 Performance indicators during delivery

Specific performance indicators will be prepared by TC 250 in line with established CEN/CENELEC processes. It is expected that they will include progress measures against milestones based on specific deliverables, and relevant financial indicators. They may also include specific targets associated with stakeholder engagement.

A table of indicators will be developed in consultation with the EC. For each indicator, this table will define objectives, measures and means of verification.

It is recommended that the design of the performance indicators is undertaken so that it provides strong administrative and technical governance, whilst retaining sufficient simplicity so that the focus of project teams remains on delivery of the highest quality Standards.

Performance against the agreed indicators will be discussed with the EC at an annual review meeting (see M/515), as a minimum.

2.4 Impact

The construction industry is hugely significant to the European economy. It is generally accepted that it accounts for some 6-7 % of total European GDP and employs approaching 15 million people. Analysis reported by the European Commission in impact assessment SEC(2008) 1900 has identified the total annual value of the European construction market as over 1,800 €Billion, with design services making up 75 €Billion.

The proposed work programme will bring significant beneficial impacts to the industry and market. These are summarised in Table 2.1.

Table 2.1: Analysis of impacts

Impact	Benefit
User confidence in Eurocodes retained as they remain state-of-the-art documents	This is an essential underpinning requirement for the Eurocodes to remain credible standards of the highest reputation, promoting confidence in their use within Europe and adoption elsewhere around the world. Increased user-friendliness in comparison with the first generation of Eurocodes will reflect best practice in standards development.
Improved efficiency of design processes and reduced barriers to entry through enhanced user friendliness	The design market has an annual worth of 75€Billion. Every 0.1% efficiency saving in design processes would therefore yield a 75€Million annual saving. The expected enhancement of efficiency is greater than this figure, although it is difficult to quantify precisely. Enhanced user friendliness will reduce barriers to entry and aid opportunities for small and medium sized enterprises.
Improved harmonization across member states, through e.g. reduction in NDPs and different design methods	Improved harmonization will reduce barriers to trade of products and services.
Use of new methods and new materials, enhanced coverage of robustness	This will enable the latest technologies and knowledge to be applied in a way that is acceptable for practitioners, promoting cost effectiveness and sustainability in design, and innovation. Given the huge size of the construction market across Europe even the most modest efficiency saving arising from new and innovative technologies will yield €multi-million annual savings.
Relevant sustainability consideration incorporated within design requirements	This supports European Community objectives, including those for energy saving and waste accrual.
Climate change consideration embraced within Eurocodes	This will provide increased resilience of long-life infrastructure assets to potential climatic changes. It is very cost effective to address such risks at the design stage rather than through later retrofitting. Such an approach also reduces user disruption and environmental impacts.
Incorporation of initial requirements for assessment and retrofit of existing structures	This supports the effective and sustainable management of existing infrastructure, providing a consistent technical framework across member states as a platform for future R&D and appropriate harmonization, enabling the sustainable life extension of existing assets.

3 Approach to execution of the mandate

3.1 General

3.1.1 Introduction

The successful development of the second generation of EN Structural Eurocodes is a complex and challenging undertaking. The approach to the execution of the mandate has been developed to address a series of key challenges. In particular:

- The focus is on what is most important, as understood from extensive consultation. Much more could be done, but the objectives must be realistic in the context of the available timescales and budgets.
- The high level of interdependency between the many Eurocode parts has demanded careful planning and phasing of activities to promote consistency of technical approach and underpin efforts to enhance the 'ease of use' of the Eurocodes.
- The work programme has been broken down into discrete tasks of focussed scope so that drafting can be undertaken by teams of experts with the highest levels of technical knowledge relevant to their work.
- A smooth transition needs to be achieved for practical users as the next generation of Eurocodes is introduced, so consideration has been given to publication schedules to ensure any incompatibility of implemented standards is avoided.

CEN/TC 250 has worked to create a realistic work programme with realistic timescales, addressing the needs of industry and the priorities of the European Commission. Whilst the work will embrace recent results of international studies from scientific and technical associations, it will be limited to developments that have an appropriate level of technical maturity and acceptance across Europe. New methods will only be introduced where they will provide significant benefit, for example in response to positive industry support or where significant changes in technology have occurred. In new areas, such as assessment, efforts will be directed to achieving useful and worthwhile progress, recognising that exhaustive treatment at this stage would be an unrealistic ambition.

All work will be undertaken in accordance with CEN regulations, along with CEN/TC250 policy, resolutions and derogations.

3.1.2 Guiding principles

Following discussions with the European Commission in April 2012, a series of guiding principles was developed for the preparation of this response. These principles were agreed by CEN/TC 250 in Berlin in May 2012 and underpin the approach to the execution of the mandate. They are presented in Table 3.1.

Importantly, it was acknowledged that the overall work programme of TC250 was likely to extend beyond the scope for which the European Commission would be able to provide funding. As a result, the overall work programme presented here contains elements for which funding is sought from the European Commission and elements that will be funded from other sources, principally by industry.

Furthermore, given funding levels likely to be available and the broad scope of the mandate, it is anticipated that even for those elements of work that receive financial support from the European Commission significant companion funding will be essential from industry. Although nothing has been settled, and cannot be until the arrangements with the commission are finalised, positive expressions of interest in helping with aspects of individual projects have been made.

Table 3.1: General Principles used the development of the Specific Mandate response

- The overall TC 250 work programme is for TC 250 to determine in line with CEN procedures.
- Under Mandate M/515, funding can be expected to be provided by the European Commission, up to a limit, for specific parts of the TC 250 work programme. As such, the TC 250 work programme will comprise some funded and some unfunded activities.
- The work programme will be phased. It is anticipated that there may be up to four overlapping phases.
- The response to the Mandate will provide an overview of the entire work programme, and greater detail for those elements proposed for inclusion in Phase 1. The phasing of work will acknowledge the interdependencies between work items.
- Phase 1 will include those parts of the work programme upon which other activities are primarily dependent for reasons of overall coordination, technical scope or because they are essential to achieving the target dates for delivery of the next generation of Eurocodes.
- The work programme will be devised so that there are no funded activities that are dependent upon the delivery of unfunded work items.

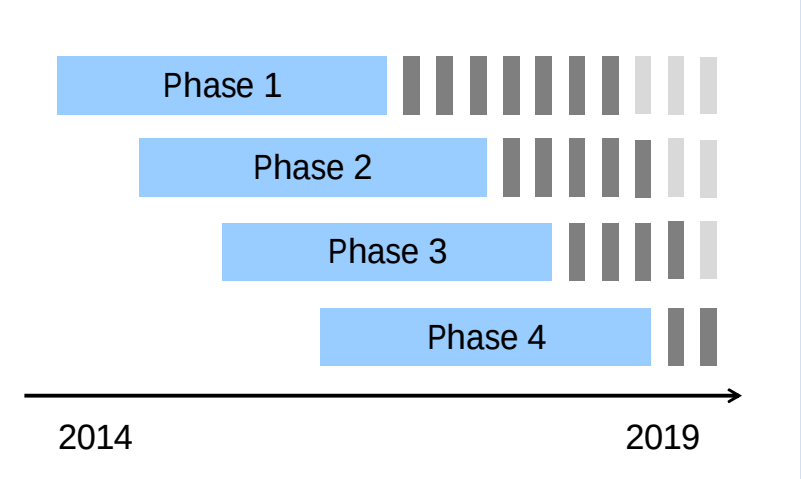
3.2 Specific aspects of the approach to the execution of the mandate

Specific aspects of the approach to the execution of the mandate that have been designed to meet the needs of users and align with the requirements of the mandate are summarised in Table 3.2.

Table 3.2: Treatment of specific issues

Aspect	Approach
Reduction of Nationally Determined Parameters	Nationally Determined Parameters (NDPs) allow Countries to decide on safety levels, and to give national geographic and climatic data, in National Annexes. The inclusion of NDPs in the published Eurocodes has been more extensive than was originally envisaged. All tasks concerned with existing Eurocode parts include a requirement to review the contents of all Countries' National Annexes and supporting documents that provide information needed to implement the Eurocode Part, and seek ways to achieve better convergence of requirements and reduce the number of NDPs. The use of the JRC database of collected National values and choices is encouraged to support this effort.
Enhancing 'ease of use'	The Eurocodes are the result of a consensus between many European experts after enormous exposure to examination. The Eurocodes are technically advanced standards which are intended to allow the design of most structures that are likely to be needed now and in the future. Accordingly they are very comprehensive, which can lead to their appearing to be more complicated than is necessary when a limited range of types of structure is to be designed. In this context, it is understandable that wishes have been expressed for "simplification" by CEN/TC250 members, the ENC group and a large number of users, and this is reflected in M/515. The legitimacy of the wish for "simplification" has been recognised by CEN/TC250 which has agreed to work towards enhancing 'ease of use' in the further development of the Eurocodes through:

	(i) improving the clarity; (ii) simplifying routes through the Eurocodes; (iii) limiting, where possible, the inclusion of alternative application rules; and, (iv) avoiding or removing rules of little practical use in design. All tasks in the work programme therefore include a requirement to work to improve the ease of use of existing Eurocode parts and ensure that new parts are drafted with an emphasis on ease of use, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements.
CEN 5-year review	Part of the CEN procedure is to hold '5 year' reviews of their standards. It was realised in 2008 that to send out the 58 parts of the Eurocodes for review 5 years after their publication dates would be of little value as they would not have been exposed to widespread practical application. The CEN BT agreed a derogation for TC 250, allowing certain of the normal rules to be relaxed, including the need for the review at 5 years. The 5 year reviews will be treated as a complementary activity to the execution of M/515, timed to be compatible with the phasing of the overall work programme so that the findings can be reviewed by the relevant Sub-committee and could inform actions to be taken by the relevant Project Team. The responses to the reviews are likely to include maintenance activities, which will not be funded under M/515.
Period of stability for users	It has been widely recognised that a period of stability is desired by users of the Eurocodes. Although the standards are now widely adopted across EU and elsewhere around the world, in many countries their use has only become widespread in the past 2 years. The work programme has been developed to respect this need for stability, with the next generation of Eurocodes not expected to be completed until 2019, at the earliest.
Complete TC250 work programme	In preparing this response, TC 250 has considered, in detail, all the work that would be beneficial to enhancing the Eurocode suite, and, by prioritising activities through consultation, has developed a realistic overall work programme. This complete work programme addresses all the requirements of M/515 but also includes further items of work identified through consultation via the Sub-committees and other groups. To provide complete transparency and enable all interdependencies to be considered, this response presents the complete planned work programme (in outline). The programme includes activities for which funding is sought from the EC and also activities that will be wholly funded by industry and other sources. The work programme has been developed so that activities for which EC funding is sought will not be contingent on the delivery of non-EC funded tasks, unless full funding for them has already been secured from other sources. Only the activities for which funding is sought from the EC will form part of the contract between CEN and the EC. It is emphasised that the fulfilment of the contractual requirements of the EC will not be dependent on any activities for which funding is not secure.

Phasing of work	The work programme has been split into four over-lapping phases, as illustrated Figure 3.1. This has been done to enable the interdependencies between activities to be effectively managed, and ensure that the work is undertaken as efficiently as possible. This approach enables a strong focus to be placed on the management and delivery of those tasks that need to be done first. It also enables the work in later phases to be tailored in response to the findings and recommendations of work undertaken in Phase 1.  **Figure 3.1: Indicative phasing of work** As described in the guiding principles in Section 3.1.2, Phase 1 will include those parts of the work programme upon which other activities are primarily dependent for reasons of overall coordination, technical scope or because they are essential for achieving the target dates for delivery of the next generation of Eurocodes. In this response full details are provided for the tasks in Phase 1, to form the basis of a contract between CEN and EC. Outline details are included for tasks in the other phases, and these will be finalised before funding for subsequent phases is formally sought.
Work packages	Annex I of M/515 identifies two work packages. Package I is concerned with standards of general relevance and the production of a technical report on requirements for climate change. Package II is concerned with material specific standards, including new Eurocodes. M/515 explains that the detailed work programme, that addresses the requirements of Annex I, is for CEN to determine. In developing the response, the requirements of each of the work packages have been carefully considered and included within the work programme presented in this response, see Section 3.2.3.
Horizontal coordination	Effective horizontal coordination will be crucial to ensure that technical and structural consistency is achieved in the next generation of Eurocodes. Overall responsibility for horizontal coordination will remain the responsibility of the TC 250 Coordination Group, supported by the existing Horizontal Groups for Bridges and Fire. Guidelines will be developed on behalf of the TC 250 CG under the direction of TC 250 WG1 providing recommendations on the treatment of common issues such sustainability, reducing NDPs, and

	enhancing ease of use. It is also planned that, following their initial work, several other working groups will fulfil horizontal coordination roles. Specifically, WG2 and WG6 will fulfil a horizontal coordination role for detailed rules on assessment and robustness, respectively, in the material dependent Eurocodes. SC1/WG on climatic actions will fulfil a horizontal coordination role in respect of climate change related issues. In addition, it will be essential that effective horizontal coordination is achieved on certain technical issues that affect multiple Eurocode parts, such as fatigue. At the direction of the TC250 CG, from time to time, ad-hoc groups drawn from relevant Project Teams will be established with the agreement of the relevant Sub-committees to agree coordinated approaches to specific technical aspects.
Step-by-step development of new Eurocodes	TC 250 policy, as set out in resolutions 254 and 255, is that the work of WGs 2, 3, 4 and 5 on assessment, glass, FRP and membrane structures follows a step-by-step approach whereby a 'Scientific and Technical Report' is published first. Subject to agreement of TC 250, this is followed by preparation and publication of a CEN Technical Specification (previously known as an ENV). (At present FRP and membrane structures are not included in the scope of M/515, although it may be extended to include them.) After a period for trial use and commenting, TC 250 will decide whether the Technical Specifications should be converted into ENs. This step-by-step approach will fulfil the need for early guidelines to be put into the public domain whilst ensuring appropriate governance and the opportunity for practical experience to be gained prior to final development as ENs. It will, however, mean that the work will take longer than the evolution of the existing standards as there will be a minimum period (expected to be around 2 years) from the publication of the Technical Specification before conversion into an EN. The production of the Scientific and Technical Reports is pre-normative work and as such will not be funded under mandate M/515.
Background documents	It is a fundamental requirement of TC 250 that all future work, including revisions to existing parts and preparation of new parts, will be accompanied by background documents that are to be made available to users of the Eurocodes.
Maintenance of existing Eurocode parts	No funding will be sought from EC for maintenance related to existing clauses in the Eurocodes under mandate M/515. The preparation and implementation of the standardisation work set out in this response will not delay high-priority maintenance tasks related to the existing Eurocodes, particularly if they concern safety issues. Such cases will follow appropriate CEN and TC 250 procedures.
Publication plan	During the execution of the mandate, final drafts of revised and new Eurocode parts will become available progressively. A clear publication and implementation plan will need to be developed that balances two key requirements. Of paramount importance, no new or revised Eurocode parts should be implemented that result in incompatibilities with other parts that have yet to be revised. Balanced against this fundamental need, there will be a desire to publish improved Eurocode parts as soon as they are available.

Governance and reporting	An annual review meeting will be held to inform the Commission about the progress of the work. In addition, CCMC will immediately inform the Commission of any problem relating to the carrying out of the mandate within TC 250. Final drafts of the new and revised Eurocode parts will be presented to the Commission for confirmation of compliance with M/515 in accordance with the agreed timetable between CCMC and the Commission. Final drafts will also be issued to national authorities for consideration of any impacts on regulatory issues, building on lessons learned during the later phases of development of the current Eurocodes.
Publication of new and revised Eurocodes parts by CEN/CENELEC members	M/515 includes a request that CEN/CENELEC members publish new and revised Eurocode parts at the latest 6 months after their adoption in CEN/CENELEC. However, to allow sufficient time for the preparation of National Annexes, CEN/TC 250 currently has a derogation allowing 12 months from the Date of Availability (DAV) of Eurocode parts to the withdrawal of existing standards. It is proposed that this derogation is maintained for the development of the second generation of EN Eurocodes.

3.3 Overview of the CEN/TC 250 Work Programme

3.3.1 Structure of the Work Programme

The structure of the work programme has been developed to meet the requirements of M/515 and align with the operating structure of CEN/TC 250.

The complete work programme has been divided into a series of tasks, under the primary leadership of an existing CEN/TC 250 Sub-committee, Working Group or Horizontal Group. Each task contains a series of sub-tasks as illustrated in Figure 3.2.

The complete work programme is presented in Annex 1. A summary of tasks and deliverables is included in Section 3.5. A diagrammatic representation of the work programme is provided in Annex 2.

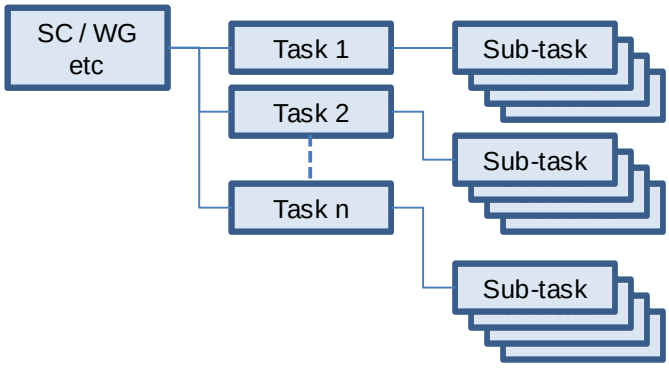


Figure 3.2: Illustrative structure of tasks and sub-tasks

3.3.2 Task Scopes and outputs

In the detailed work programme presented in Annex 1, a common template has been used to set out the scope and output for each task. The template has been developed to provide the information requested in M/515, including details of reference documents that will provide a basis for the standardisation work.

In addition, the template includes the proposed phase for each task together with supporting justification if the task is included in Phase 1. For each sub-task, the template defines priority items for inclusion in the EC contract under M/515, with specific justification provided where relevant.

As noted in Section 3.1.2, all tasks concerned with existing Eurocode parts include some common requirements in their scope. Standard requirements on reducing NDPs and enhancing ease of use have been included as sub-tasks 1 and 2 in all such tasks. The provision of background documents is a common requirement for all tasks. Funding for maintenance activities is not included in any tasks.

Typically tasks are associated with particular Eurocode parts. However, in some cases, it has been determined that an alternative approach will be more effective in successfully fulfilling the objectives of the Mandate. Therefore, in some cases several tasks contribute to the evolution of particular parts and in others, several related Eurocode parts are included within the scope of a single task.

3.3.3 Relationship between M/515 work packages and the TC250 work programme

Table 3.3 provides a general mapping between the requirements of the M/515 work packages and the approach that will be used to fulfil them, with references included to specific tasks in the TC 250 work programme where relevant.

Table 3.3: Approach to addressing M/515 requirements

Requirement	Task / Approach
5.1(a) and 6.1(a) Extension of existing rules for the assessment of existing buildings and structures and their strengthening	Scientific and technical report will be developed by WG2 (WG2.T1.1), and converted into CEN TS for general rules (WG2.T1.2) and actions (WG2.T1.3).
5.1(b) and 6.1(b) Extension of existing horizontal rules for robustness	Development of robustness rules for normal and accidental actions (WG6.T1) will be undertaken by WG6, and adopted within EN 1990 and EN 1991. Horizontal implementation of new and revised robustness rules will be developed within all relevant Eurocodes with horizontal coordination by WG6 (WG6.T2).
5.2(a) and 6.2(a) Reduction in the number of Nationally Determined Parameters (NDPs)	Common sub-task included in all tasks relating to existing Eurocode parts
5.2(b) and 6.2(b) Refinement to improve the 'ease of use' of Eurocodes by practical users	Common sub-task included in all tasks relating to existing Eurocode parts. Common requirement included in the scope of all tasks relating to new Eurocode parts.
5.2(c) and 6.2(c) Incorporation of recent results … relevant to innovation	Included in all relevant Tasks.
5.2(d) and 6.2(d) Incorporation of recent results … relevant to contribution of structural design to sustainability	Consistent guidance will be developed by WG1 under direction of TC 250 CG, and adopted within all relevant Tasks.
5.2(e) and 6.2(e) Adoption, where relevant, of ISO standards to supplement the Eurocodes family (inc. atmospheric icing of and actions from waves and currents on coastal structures)	Conversion of ISO 12494:2001 "Atmospheric Icing" into EN-ISO 12494 (SC1.T8). Conversion of ISO 21650:2007 "Actions from waves and currents on coastal structures" into EN-ISO 21650 (SC1.T7).
5.2(f) and 6.2(f) Developing auxiliary guidance documents to facilitate feedback from stakeholders and the practical local implementation wherever necessary.	The need to develop recommendations for auxiliary guidance will be monitored by CEN/TC 250 CG. Specific requirements will be agreed with the EC for inclusion in Phase 4 as a horizontal coordination activity.
5.2(g) Developing information on the determination of material and resistance factors, serviceability for buildings and bridges; fatigue verification; improving the fire safety engineering approach (EN 1990)	Additional content on material and resistance factors and load and combination factors, serviceability of buildings and fatigue verification, will be developed in Task TCEN1990 (Sub-tasks 1.7, 1.8, 1.9).

	Serviceability of bridges is addressed in TCEN1990.T2.
5.2(h) Incorporating new developments in the field of traffic loads and climatic actions; atmospheric icing; waves and currents (EN 1991)	Revision and extension of EN 1991 will be undertaken by SC1 to include additional road and rail traffic loads (SC1.T9). New Eurocode parts will be developed by SC1, including conversion of ISO 12494:2001 “Atmospheric Icing” to EN-ISO 12494 (SC1.T8) and of ISO 21650:2007 “Actions from waves and currents on coastal structures” to EN-ISO 21650 (SC1.T7).
5.2(i) and 6.2(g) Providing a clear and complete list of background documents used during the standardisation process	Background documents will be prepared for all work.
5.2(j) and 6.2(h) Developing a technical report analysing and providing guidance for potential amendments for Eurocodes with regard to structural design addressing relevant impacts of future climate change (general and material specific)	A report on the impact of climate change will be developed by SC1 in consultation with other SCs and WGs. This work will make use of the results obtained in many on-going research projects on climate change carried out over Europe. This report will then inform the work of SC1 and other SCs, WGs and HGs.
6.2(i) Assessing the link to harmonised product standards developed under the framework of the Construction Products Directive/Regulation (89/106/EEC, 305/2011/EU) or other European standards, in particular with regard to any discrepancies between Eurocodes calculation approaches and performance declarations provided by CE marked products	This important coordination activity will be led by TC 250 WG1, in conjunction with the TC 250 CG. Appropriate resources will be allocated in recognition of the need to ensure effective liaison with relevant TCs. Existing and important TC liaisons are highlighted in the Work Programme in Annex 1.
6.3(a) to (g) New Eurocode on Glass	Scientific and technical report will be developed by WG3 (WG3.T1) and converted into CEN TS for general rules and material (WG3.T2.1), for design of plates, its supports and fixations (WG3.T2.2) and for design of primary members of glass, beams, columns and special joints (WG3.T2.3). Conversion of CEN TS into EN on Structural Glass.

3.4 Organisation and coordination

3.4.1 Organisation and leadership

Overall responsibility for the execution of the mandate and the delivery of the work programme will be held by TC 250.

TC250 will retain its established structure to lead the execution of the mandate. As explained in 3.2.1, all tasks will be delivered under the primary leadership of an existing CEN/TC 250 Sub-committee, Working Group or Horizontal Group illustrated in Figure 3.3.

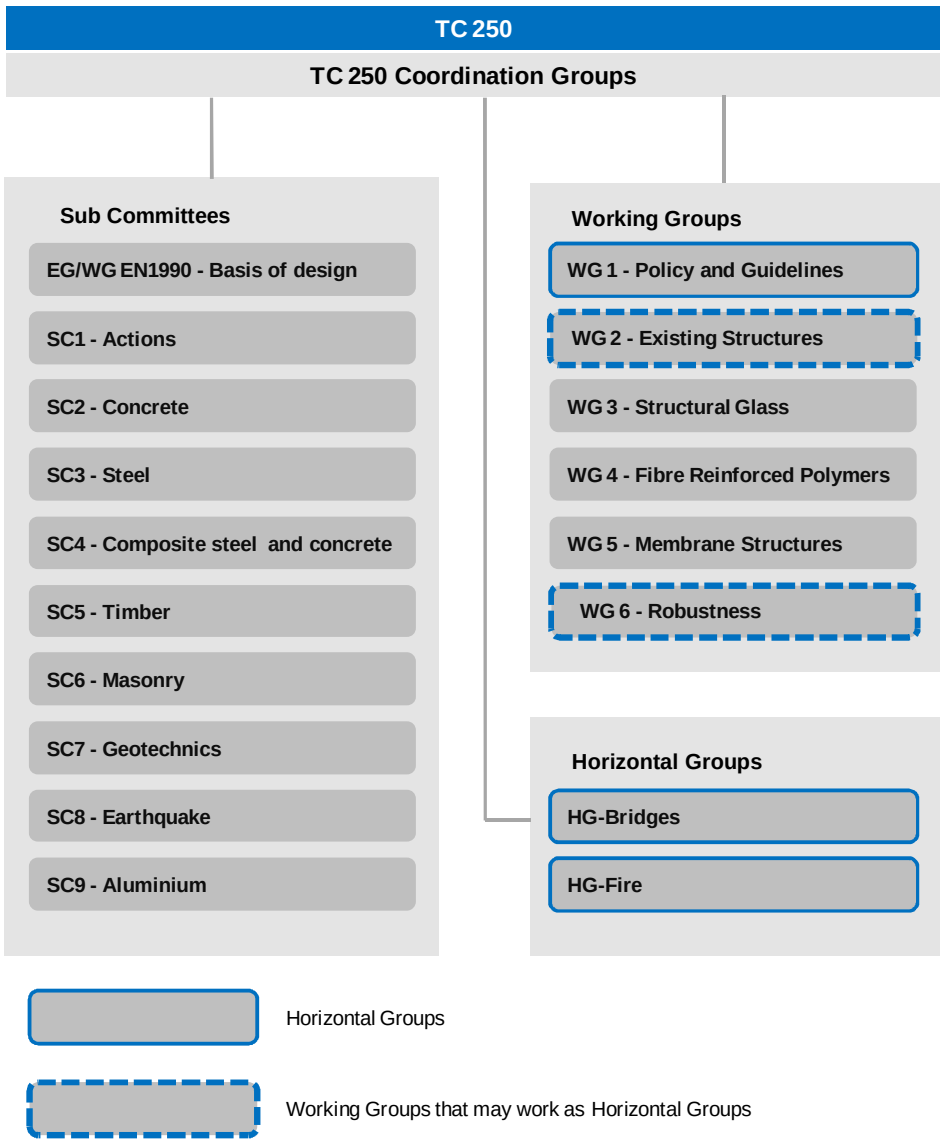


Figure 3.3: Illustrative diagram showing the TC250 structure

Project Teams will be established to undertake each of the tasks. In line with TC 250 document N250, such teams will typically have 6 members to ensure an appropriate representation from member states whilst promoting cost effectiveness. Slightly larger teams may be acceptable in exceptional circumstances. The Chairman and Secretary of the responsible SC / WG or HG will serve as ex-offico members of each Project Team.

The appointment of Project Teams that will receive funding will be undertaken in line with the Framework Partnership Agreement (FPA) 2009 rules for award of contracts, and may involve competition. The contracts for each of the Project Teams will be based on the scope of work for each task included in this response. Project teams will be responsible to their appropriate SC, WG or HG, and their responsibilities will end when they have provided a draft that the SC, WG or HG accepts as being a correct and adequate response to the contract. After the SC, WG or HG has accepted a draft from a PT as meeting its contract, the SC, WG or HG will be responsible for the finalisation of the document to Formal Vote within the CEN rules.

3.4.2 Coordination

As explained in Section 3.1.2, TC 250 Coordination Group will have overall responsibility for horizontal coordination, supported by the existing Horizontal Groups for Bridges and Fire.

Furthermore, for common issues such as sustainability, reducing NDPs, and enhancing ease of use, common guidelines will be developed on behalf of the TC 250 CG under the direction of WG1 providing recommendations on the treatment of such issues by Project Teams.

Following their initial work several working groups will also fulfil horizontal coordination roles. WG2 will fulfil a horizontal coordination role for assessment, WG6 will do so for robustness, and the SC1/WG2 will do so for Climate Change.

At the direction of the TC250 CG, ad-hoc groups drawn from relevant Project Teams may be established to agree coordinated approaches to specific technical aspects, such as fatigue, that span multiple Eurocode parts.

3.5 Summary of tasks and final deliverables

A summary of the tasks in the TC 250 work programme and their final deliverables is provided in Table 3.4. Further details are included in the complete work programme given in Annex 1.

Table 3.4: Summary of the tasks and final deliverables

Task Ref.	Task Name	Deliverable
TCEN1990		
TCEN1990.T1	Evolution of EN1990 – General.	Revised EN 1990 including new Annexes. Background information.
TCEN1990.T2	Evolution of EN1990 – Bridges specific issues.	Revised EN 1990 Annex A2 including two new Annexes to EN 1990. Background information.
SC1		
SC1.T1	EN 1991-1-2 (Fire)	Revised EN 1991-1-2 with modified clauses. Background document(s).
SC1.T2	EN 1991-1-3 (Snow loads)	Revised EN 1991-1-3 with new and modified clauses. Background document(s).
SC1.T3	EN 1991-1-4 (Wind)	Revised EN 1991-1-4 with new and modified clauses. Background document(s).
SC1.T4	EN 1991-1-5 (Thermal actions)	Revised EN 1991-1-5 with new and modified clauses. Background document(s).
SC1.T5	Climate change	Report. Recommendations for EN 1991-1-3, -1-4, -1-5 and EN 1991-1-9 (and possibly other Eurocode Parts).
SC1.T6	Interdependence of climatic actions (wind, snow, thermal and atmospheric icing) and glass structure	Recommendations for EN 1991-1-3, -1-4, -1-5 and EN 1991-1-9 (and future Eurocode for Structural Glass). Background document(s)
SC1.T7	EN 1991-1-8 (Waves and Currents)	New Eurocode part (Conversion of ISO 21650:2007 to EN-ISO 21650). Background document(s)
SC1.T8	EN 1991-1-9 (Atmospheric Icing)	New Eurocode Part (Conversion of ISO 12494:2001 to EN-ISO 12494). Background document(s).
SC1.T9	EN 1991-2 (Road and rail traffic loads)	Revised EN 1991-2 with new and/or modified clauses. Background documents
SC1.T10	EN 1991-4 (Silos and Tanks)	Revised EN 1991-4 with new clauses and sections. Background document(s).

SC1.T11	Evolution of existing parts of EN 1991 not included in the other tasks	Revised EN 1991-1-1, EN 1991-1-6, EN 1991-1-7, EN 1991-3
SC2		
SC2.T1	New Items in EN 1992-1-1, EN 1992-2, EN 1992-3	New and modified content in EN 1992-1-1, EN 1992-2 and EN 1992-3 including new Annexes.
SC2.T2	New Items in EN 1992-1-2	New chapter in EN 1992-1-2.
SC3		
SC3.T1	Design of Sections and Members according to EN 1993-1-1	Revised EN 1993-1-1. Background documents.
SC3.T2	Joints and Connections according to EN 1993-1-8	Revised EN 1993-1-8. Background documents.
SC3.T3	Cold-formed members and sheeting. Revised EN 1993-1-3	Revised EN 1993-1-3 with modified Annex D. Background documents.
SC3.T4	Stability of Plated Structural Elements. Revised EN 1993-1-5	Revised EN 1993-1-5. Background documents.
SC3.T5	Harmonisation and Extension of Rules for Shells and Similar Structures. Revised EN 1993-1-6 and EN 1993-1-7	Revised EN 1993-1-6. Revised and restructured EN 1993-1-7. Background documents.
SC3.T6	Fire design of Steel Structures. Revised EN 1993-1-2	Revised EN 1993-1-2. Background documents.
SC3.T7	Stainless Steels. Revised EN 1993-1-4	Revised EN 1993-1-4 with new and modified clauses. Background documents.
SC3.T8	Steel Fatigue. Revised EN 1993-1-9	Revised EN 1993-1-9 with new clauses and modified Annex B. Background documents.
SC3.T9	Material and Fracture. Revised EN 1993-1-10	Revised EN 1993-1-10 with new and modified clauses. Background documents.
SC3.T10	Steel bridges and tension components. Revised EN 1993-2 and EN 1993-1-11	Revised EN 1993-2 with modified Annexes A, B, C, D. Revised EN 1993-1-11 with modified Annex A. Background documents.
SC3.T11	Consolidation and rationalisation of EN 1993-3	Revised EN 1993-3-1 and EN 1993-3-2. New Annex in EN1991-1-4. Background documents.
SC3.T12	Harmonisation and Extension of Rules for Storage Structures. Revised EN 1993-4-1 and EN 1993-4-2	Revised EN 1993-4-1. Revised and redrafted EN 1993-4-2. Background documents.

SC3.T13	Evolution of existing parts of EN 1993 not included in the other tasks	Revised EN 1993-1-12, EN 1993-4-3, EN 1993-5, EN 1993-6
SC4		
SC4.T1	Respond to demands from industry, including needs for harmonization with EN1992 and EN1993.	Revised EN 1994-1-1, EN 1994-1-2 and EN 1994-2.
SC4.T2	Composite beams with large web openings.	New part of EN 1994 or revised EN 1994-1-1 and -1-2. Background documents.
SC4.T3	Revised rules for shear connection in the presence of modern forms of profiled sheeting.	Revised EN 1994-1-1. Background documents.
SC4.T4	Develop new rules for composite columns (concrete filled tubes) in fire.	Revised EN 1994-1-2 Annex H. Background documents.
SC4.T5	Development of rules covering shallow floor construction, and other flooring types using precast concrete elements.	New part of EN 1994 or revised EN 1994-1-1 and -1-2. Background documents.
SC4.T6	Extended scope of shear connector and materials guidance to cover current industrial needs.	Revised EN1994-1-1 and possibly EN1994-1-2 and EN1994-2. Background documents.
SC4.T7	Development of rules for composite frames and prestressed elements.	Revised EN1994-1-1 and -1-2. Background documents.
SC5		
SC5.T1	New items in revised Eurocode 5, part 1-1.	Revised EN 1995-1-1 with new clauses. Background documents.
SC5.T2	New Eurocode 5 Part on Timber Concrete Composites.	New Eurocode part in EN 1995. Background documents.
SC5.T3	Revised Eurocode 5, part 1-1.	Revised EN 1995-1-1 with new and modified clauses. Background documents.
SC5.T4	Revised Eurocode 5, part 1-2 (Fire).	Revised EN 1995-1-2 with new and modified clauses. Background documents.
SC5.T5	Revised Eurocode 5, part 1-1.	Revised EN 1995-1-1 with new or modified clauses. Background documents.
SC5.T6	Evolution of existing parts of EN 1995 not included in the other tasks	Revised EN 1995-2
SC6		
SC6.T1	Revised version of EN 1996-1-1.	Revised EN 1996-1-1 with new and revised clauses.
SC6.T2	Revised version of EN 1996-1-2.	Revised EN 1996-1-2 Annexes B, C, D.

SC6.T3	Revised version of EN 1996-2.	Revised EN 1996-2 with new and modified clauses.
SC6.T4	Revised version of EN 1996-3.	Revised EN 1996-3 with new and modified clauses.
SC7		
SC7.T1	Harmonization and ease-of-use.	Reorganized framework of EN 1997. Split EN 1997-1 into two parts: EN 1997-1 General rules; EN 1997-3 Geotechnical constructions.
SC7.T2	General rules.	Revised EN 1997-1. Modification to the text and annexes of EN 1997-2; additions to the text of EN 1997-1 section 2 and Annexes A and B. Scientific and Technical Report on Practical Examples.
SC7.T3	Ground investigation.	Revised EN 1997-2 with new/revised paragraphs and annexes. New content in EN 1997-1 with new Annex. Scientific and Technical Report on Practical Examples.
SC7.T4	Foundations, slopes and ground improvement.	Sections 2-5 and new Annexes in (new) EN 1997-3. Alignment with EN 1992, EN 1993, EN 1995 and EN 1996. Scientific and Technical Report on Practical Examples.
SC7.T5	Retaining structures, anchors, and reinforced ground	Sections 6-8 and new Annexes in (new) EN 1997-3. Alignment with EN 1992, EN 1993, EN 1995 and EN 1996. Scientific and Technical Report on Practical Examples.
SC7.T6	Rock mechanics and dynamic design.	New/revised content in EN 1997-1, -2, and -3 and (possibly) in EN 1998-5. Scientific and Technical Report on Practical Examples.
SC8		
SC8.T1	Material independent sections of EN 1998-1.	Redrafting of Section 3 and Annex B of EN 1998-1.
SC8.T2	Material dependent sections of EN 1998-1.	Revision and update of Sections 5 to 9 of EN 1998-1 with new Section.
SC8.T3	Evolution of EN 1998-3.	Revision, update and extension of EN1998-3.
SC8.T4	Evolution of EN 1998-5.	Revision and update of EN1998-5.
SC8.T5	Evolution of EN 1998-4 and EN 1998-6	Revision and update of EN1998-4 and EN 1998-6.

SC8.T6	Evolution of existing parts of EN 1998 not included in the other tasks	Revised EN 1998-2
SC9		
SC9.T1	Update and Simplification of all parts of EN 1999.	Partially revised EN 1999-1-1 and revised EN 1999-1-2, EN 1999-1-3, EN 1999-1-4, EN 1999-1-5 with new and/or modified clauses
SC9.T2	New types of Connection.	Further revised EN 1999-1-1 with new clauses.
SC9.T3	Roofing.	Further revised EN 1999-1-1 by new Annex.
SC9.T4	Bridging.	Further revised EN 1999-1-1 by new Annex.
SC9.T5	Facades.	Further revised EN 1999-1-1 by new Annex.
HG-B		
HG-B.T1	Bridges - consultation activities and ease of use review	Report containing specific recommendations to other SCs. Series of papers setting out discussion points and specific recommendations for other SCs, WGs etc.
HG-B.T2	Bridges - ease of use and technical consistency review	Recommendations for other SCs / WGs on improvements to draft new and revised Eurocode parts.
HG-F		
HG-F.T1	Harmonization of fire parts of Structural Eurocodes.	Harmonized sections 1 to 3 of the parts 1-2 of all related Eurocodes. New informative Annexes in EN 1992-1-2, EN 1993-1-2 and EN 1994-1-2.
WG2		
WG2.T1	Assessment and Retrofitting of Existing Structures – General Rules / Actions.	Scientific and Technical Report. Conversion of the Report into CEN TS for general rules and actions.
WG2.T2	Assessment and Retrofitting of Existing Structures – Concrete Structures. This task is solely coordination with SC2.	Conversion of the Report into CEN TS for concrete structures.
WG2.T3	Assessment and Retrofitting of Existing Structures – General Rules / Actions. Preparation of EN	Conversion of CEN TS into EN on Assessment and Retrofitting of Existing structures for general rules and actions.
WG3		
WG3.T1	Structural Glass – Preparation of Scientific and Technical Report	Scientific and Technical Report.
WG3.T2	Structural Glass – Preparation of CEN TS	Conversion of the Report into CEN TS on Structural Glass (parts 1, 2 and 3).
WG3.T3	Structural Glass – Preparation of EN	Conversion of CEN TS into EN on Structural Glass (parts 1, 2 and 3).

WG4		
WG4.T1	Fibre Reinforced Polymers – Preparation of Scientific and Technical Report.	Scientific and Technical Report.
WG4.T2	Fibre Reinforced Polymers – Preparation of CEN TS	Conversion of the Report into CEN TS on Fibre Reinforced Polymers.
WG5		
WG5.T1	Membrane Structures – Preparation of Scientific and Technical Report.	Scientific and Technical Report.
WG5.T2	Membrane Structures – Preparation of CEN TS	Conversation of Report into CEN TS on Membrane Structures.
WG6		
WG6.T1	Robustness Framework.	New and revised clauses in EN 1990 and EN 1991-1-7. Report.
WG6.T2	Robustness rules in material related Eurocode parts.	New/modified clauses in material related Eurocodes (SC2, SC3, SC4, SC5, SC6, SC9).

3.6 Schedule and milestones

An outline schedule (Gantt chart) for the execution of the mandate is included in Annex 3, highlighting significant interdependencies between activities.

In addition, Annex 3 contains a description of the various stages that will need to be followed in the revision of existing Eurocode parts and the development of new ones.

Annexes

Annex 1 – Detailed Work Programme

Annex 2 – Overall structure of TC250 work programme (diagrammatic)

Annex 3 – Outline Schedule

Annex 1 – Detailed Work Programme

Task Ref:	**TCEN1990.T1**	**Task Name:**	Evolution of EN1990 – General
Proposed Task Phase:	**P1**	**Deliverable:**	A new version of EN 1990 with an increased scope reflecting needs identified by National Standard Bodies and the other Eurocodes, together with background information for all changes and new material, excluding new version of Annex A2 for bridges and new Annex Es relating to bearings and expansion joints.
Outline Task Scope:		Revision of EN 1990 to incorporate comments from the EN 1990, 5 year review and requirements from other Eurocodes for principle guidance on fatigue, non-linear analysis etc with the Specific Mandate Section 5 from Mandate for amending existing Eurocodes and extending the scope of structural Eurocodes (Document Doc.28/2012 – EN, Brussels, 13th July 2012). Scope does not include specific work relating to Bridges which is included in Task TCEN1990.T2.	
Starting documents:		EN 1990: Basis of Structural Design	
Justification for inclusion in Phase 1:		EN 1990 is the head Eurocode, setting the rules for achieving safety, serviceability, robustness and durability as well as Reliability and Quality Management for the other 57 parts of the Structural Eurocode suite and CEN structural product standards. It is the cornerstone for all other Structural Eurocodes and serves as a template for the development of new parts as well as revision of existing standards. The items identified by the CEN/TC250/Expert Group for the revision of EN 1990 described in this proposal have been developed collaboratively with a representative cross section of stakeholders and need to be given priority. The selected tasks will further support and strengthen harmonisation, the development of an EU Internal Market in the design and construction sector. The work takes into account market and research developments in materials, products, construction techniques and design methods in the sector. It also reflects new societal needs and demands as linked to structural design of buildings and other construction works. Therefore EN 1990 as the head code needs to be updated at the earliest convenience so as to form a basis for the work of the other sub-committees. As full a draft as possible must be made available at end of Phase 1.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.	-			✓
3	Transfer of Basis of Design rules from EN 1991-1-6, EN 1991-3, EN 1991-4, EN 1993-3-1, EN 1993-3-2 and EN 1991-7.	There are a number of Basis of Design clauses at present included in EN 1991, such as EN 1991-1-6, EN 1991-3 and EN 1991-4, and EN 1993-3-1 and EN 1993-3-2 on Towers and Masts and EN 1991-1-7. These parts, including γ factors will be moved to EN 1990, to guarantee consistency with general rules and harmonisation. (N.B. as this is a maintenance activity no resources have been allowed for it).	All work to provide information completed	All Basis of Design information will be in EN 1990 thus avoiding mixed responsibilities that can lead to inconsistency.	New Annexes A3, A4 and A5 in EN 1990.	
4	Evolution of management of structural reliability of construction works (Annex B)	Adapt EN 1990 by establishing and implementing control procedures for design and execution in agreement with the principles of the standard, on a national level recognizing differences between the various countries. Making Annex B of EN 1990 more comprehensive by increasing its scope to construction works with higher consequences of failure than Consequence Class 3 and recognizing complexity of design. Improving alignment with Execution Standards (EN 1090 and EN 13670) and appropriate material Eurocodes.	EN 1990 as the head code needs to be updated first so as to form a basis for the work on reliability differentiation of the other SCs and WGs and CEN Committees developing Execution Standards	The evolution of Annex B, which is expected to be kept informative, will assist NSBs in helping ensure that the assumptions in the Eurocodes relating to quality management during design and execution are fulfilled and thus leading to increased levels of safety. EN 1990 as the Head code will ensure alignment with related annexes in material parts together with consistent approach.	Revised Annex B and revisions to Section 2.	✓
5	Robustness	Review and update as necessary the requirements for Robustness in Section 2 of EN 1990 in the light of recent published cost action (COST Action TU0601. 2011) report. It is expected that work will also include moving some information from EN 1991-1-7 to EN 1990 and further developing these rules. This will be in liaison with WG6: Robustness.	In liaison with WG6: Robustness	Ensure that the requirements for robustness reflect the latest state of the art.	Updated Section 2 of EN 1990. Based on the recommendations of WG6 the Inclusion of new clauses into EN 1990, based on content currently included in other Eurocodes.	✓
6	Sustainability	Update EN 1990 to include aspects of sustainability relevant to the scope of the Eurocodes, responding to the relevant requirements for Sustainability developed by e.g. TC 350. At the present time any amendment will be Section 2 Requirements.	EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs.	EN 1990 will address the new Requirement the "Sustainable use of natural resources" in particular as it addresses durability in the CPR.	New and modified clauses in EN 1990.	✓

7	Evolution of Annex C with additional material on Material and Resistance Factors; Load and Combination Factors	Amend Sections 4 and 6 and extend the scope of Annex C to enhance usefulness for practical users: • Provide background on the determination of γ_M and γ_R factors dependent upon strength parameters and calculation models. • Provide background on the determination of γ_G and γ_Q factors for actions and for model uncertainties. • Provide guidance on inter-relationship of climatic actions • Provide strong links between the load combination expressions and information contained in Annex B.	EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs.	Opportunity to achieve more economic design without reducing levels of safety and increased clarification.	New and modified clauses in EN 1990 in Sections 3, 4, 6 and Annex C of EN 1990.	✓
8	Serviceability of buildings	Buildings: Serviceability limit states: EN 1990 gives basic models for different deflections and displacements. More precise guidance needed including design criteria. Vibrations are a concern in certain types of structures e.g. grandstands; some temporary structures; some floor structures; evaluate possibility of giving better guidance. Aim to better align criteria from material parts and achieve better consistency.	EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs. Work on serviceability requirements for bridges is being undertaken by bridges is being undertaken by SC1, see also task TCEN1990.T2.	Giving essential advice to practitioners on serviceability of buildings and bridges.	Buildings: either extend coverage of Annex A1 with NDPs or alternatively a new informative Annex.	✓
9	Fatigue verification	New requirements need to be developed on fatigue verification including rules for load Combinations and Safety assumptions and rational rules for reducing partial factors where various types of inspection regimes are performed.	- EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs. - CEN/TC250/SC1 and HG Bridges	The provision of rules on fatigue. There is almost no guidance in this key topic in the present EN 1990. The provisions are needed in practice for structures subjected to dynamic loads.	Changes to Sections 1 - 6, and Annex A and C of EN 1990.	✓
10	Ultimate limit states	Three aspects that need development based on the needs of the user: • Investigation whether a new presentation of the verification method based on single consistent approach for ULS will improve clarity and ease of use. • Design Approaches 1, 2 and 3 for STR/GEO where there is soil/structure interaction – harmonization with better guidance coordinated with EN 1997-1 (In collaboration with CEN/TC250/SC7).	- EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs. - CEN/TC250/SC7	Better guidance and increased clarity on EQU-STR-GEO ULS verification. In particular the formulation for EQU (Equilibrium) leads to inconsistencies when STR/GEO is also needed and this will be resolved.	Changes to Sections 6, and Annexes A1 to A5 as appropriate.	✓
11	Non-linear analysis	Requirements and general guidance needed for verification methods when applying non-linear analyses in design, in particular concerning how partial factors and model uncertainties should be applied.To include: improved calculation of design values of load-effects (M, N, V and deformations), and as part of predicting ultimate load carrying capacity.	- EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs. - CEN/TC250/SC2 and eventually most SCs and HG Bridges	The provision of general rules on non linear analysis, which will be complemented by detailed rules specific for different materials in EN 1992 to EN 1999. There is almost no guidance in this key topic in the present EN 1990.	Changes to Sections 5 and 6, and Annexes A and C.	✓
12	Basis of Design information for New Eurocodes (assessment, glass, FRP and membrane structures)	Review need for any change for EN 1990 resulting from the JRC technical reports on Assessment of Existing Structures (WG2), Glass (WG3), FRP (WG4) and Membrane Structures (WG5). Likely to need to address issues relating to brittle failure in EN 1990.	WG 2, 3, 4 and 5	New guidance in EN 1990 as necessary to use the proposed new material and action Eurocodes.	Section 5 and possible new Annex	✓
13	Individual technical comments as they arise from practitioners which EG consider important for inclusion in EN 1990	e.g. Lateral Stability of Structures	-	Increasing the scope by providing important guidance based on comments from practitioners.	Whole of EN 1990 as appropriate	Likely to be maintenance issues, but review any funding needs in subsequent phases.
14	Foreword	Produce new Foreword (appropriately aligned with CPR) and to be used for all Eurocodes.	- EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs. - Essential for all other Parts in the Eurocode suite	Brings EN 1990 up to date with related European legislation.	The Foreword	
15	Design assisted by testing	Review relevant content of material parts and seek to address inconsistencies and conflicts through updating Annex D; and extend Annex D with rules related to Actions (e.g. wind tunnel tests). Work also needs to be undertaken in the context of content of related Product Standards.	- EN 1990 as the head code needs to be updated first so as to form a basis for the work of the other SCs and WGs. - CEN/TC250/SC2, SC3, SC4, SC5, SC6 and SC7 Bridges	Will make Annex D more comprehensive and apply to all materials	Section 5 and Annex D	✓
16	Climate change	To consider Section 4: Basic Variables which includes principle advice on actions and their effects regarding guidance on climate change.	- CEN/TC250/SC1 will take the lead on preparing the climate change report request in M515 - EN 1990 as the head code needs to be updated with general requirements first so as to form a basis for the work of the other SCs and WGs.	Principle guidance to practitioners	Section 4	✓
17	Alignment with EN 1997	Transfer basis of design information from EN 1997 and ensure full consistency between EN 1990 and EN 1997.	CEN/TC250/SC7	Alignment with EN 1997	Most sections as appropriate	✓
18	Loading requirements relating to atmospheric icing and current and waves	Inclusion of necessary parameters (e.g. partial and combination factors) in Annex A1 to A5 as appropriate. Possible changes to Section 4.	CEN/TC250/SC1	Alignment with EN 1991	Section 4	✓

Task Ref:	**TCEN1990.T2**	**Task Name:**	Evolution of EN1990 – Bridges specific issues
Proposed Task Phase:	**P2**	**Deliverable:**	A new version of EN 1990 Annex A2 and new Annex Es relating to bearings and expansion joints.
Outline Task Scope:		Revision of EN 1990 to incorporate comments from the EN 1990, 5 year review and requirements from other Eurocodes for principle guidance on fatigue, non-linear analysis etc with the Specific Mandate Section 5 from Mandate for amending existing Eurocodes and extending the scope of structural Eurocodes (Document Doc.28/2012 – EN, Brussels, 13th July 2012). In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1990: Basis of Structural Design; Papers developed through formal liaison between TC 250 Horizontal Group – Bridges (HG-B) and TC167, German Annex E; EN 1337 design requirements; Spanish paper (MO) providing illustrations of issues; ETAGs for expansion joints; various National Documents; Various national standards and industry guidance documents related to integral bridges.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Design of integral bridges	Integral bridges have become a popular form of construction in many European countries because of their improved durability and the avoidance of expansion joints and some bearings. However, cyclical thermal movements of integral bridge decks lead to enhanced earth pressures behind abutments. Key aspects of the design of integral bridges are not currently addressed in the Eurocodes. National Contacts of HG-B identified the need to develop rules for integral bridges as a priority. Work will draw upon existing national requirements from UK and other countries.	Work to be undertaken in conjunction with HG-B and SC7	Establishment of common rules across Europe for a very common form of structure, which are currently being provided at a National level. Promotion of the use of this form of structure, which can provide significant sustainability benefits in relation to improved durability and reduced delays to travellers due to maintenance works.	(i) new clauses in Annex A2 to EN 1990 covering treatment of combinations of actions involving earth pressures affected by thermal movement of bridge decks (ii) possibly a new informative annex to EN 1997 (prepared under this task for SC7 review / acceptance)	✓
4	Bridge bearings and expansion joints	Aspects of the design of bridge bearings, in particular the appropriate combinations of actions to be used, are not currently well covered in Eurocodes. Liaison has been established with TC 167 to address alignment issues with EN1337. National Contacts to the HG-B have asked for the refinement of design rules for bearings and for the removal of inconsistencies between standards.	Work to be undertaken in conjunction with HG-B, SC1, SC3 and TC167	Address incompatibilities between Eurocodes and with product standards. Establish consistent philosophy to improve ease of use and avoid development of national guidelines to address current deficiencies in Eurocodes.	Two new Annex Es to EN 1990 Minor modification proposed for EN 1991-1-5 (removal of content) Removal of content from EN 1993	✓
5	Review and incorporation of recommendations for revisions to EN 1990 Annex A2 developed through other tasks, including fatigue and vibration of footbridges.	Several sub-tasks have been included by other groups that will have implications for EN 1990 Annex A2. This sub-task includes for the review of these proposals and incorporation into Annex A2 in a consistent manner to ensure ease of use.	Work to be undertaken in accordance with HG-B. Primarily TCEN1990.T1 and SC1.T9	Ensure that proposals are effectively reviewed and incorporated into EN 1990 in a clear and consistent manner.	Fully revised EN 1990 Annex A2	✓

Task Ref:	**SC1.T1**	**Task Name:**	EN 1991-1-2 (Fire)
Proposed Task Phase:	**P1**	**Deliverable:**	Revised EN 1991-1-2 with additional clauses Background document(s)
Outline Task Scope:		Definition of harmonized models and methods on localized and natural fire	
Starting documents:		Existing rules of Annexes C and E of EN 1991-1-2 and relevant NAs	
Justification for inclusion in Phase 1:		SC1.T.1.3 - The task is urgent as it is related to safety issues, especially in the cases of MS where the calculation of localized fire is mandatory. SC1.T.1.4 - The task is urgent as several MS have introduced this Annex E in their National Annex, with major modifications. Hence there is a need to revisit this item, in view of a future harmonization. SC1.T.1.5 - The task is not urgent but the Annex B must be in line with the latest state of the art on localised fire.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Fire actions: Annex C on localized fire	Existing models allow considering the temperature either along the axis of the flame of the localized fire or at the ceiling level. In the past, with 2D simple calculation, it was always possible to find a solution for the calculation of an element subjected to localised fire, but nowadays all calculations are performed in 3D. For a 3D model no solution exists for vertical member not engulfed on the fire (e.g. a column at 2m of a localized fire, no rules to determine the temperature). At the early stage of the fire or if the compartment is really big (e.g. train station, sport hall), the flame is not impacting the ceiling, so it is impossible to know the temperature at the ceiling level for the different structural members.	-	The issue is important given that in some National Annexes calculation of localized fire is mandatory. When this is not the case it is the Checker who is often imposing this scenario when engineering offices apply fire engineering. Moreover, for some types of structures, the localised fire is the only possible fire scenario (e.g. open car park, train station, bridges) There is a need to agree on the model(s) to be used.	Modified clauses	✓
4	Fire actions: Annex E on natural fire	Several Member States have introduced this Annex in their National Annex, but with major modifications (Fire load, Gamma factors, etc.). These divergences on such an important issue create a need for harmonization. Scenarios could be added for other structures than dwellings (e.g. open plan offices, car parks) on the basis of the different results of the project on localised fire	-	Some rules needs to be clarified and a common approach needs to be agreed between the various Member States in view of a harmonized approach In fact, the only way for promoting the Natural Fire Safety Concept presented in Annex E of EN 1991-1-2 is to agree on a common method that will be accepted by all the Member States, without major modifications in their respective National Annex.	Modified clauses	✓
5	Fire actions: Annex B on external fire	The annex B related to external fire will be reviewed and eventually modified to fit with the latest state of the art	-	Some rules will be clarified based on the latest state of the art.	Modified clauses	

Task Ref:	**SC1.T2**	**Task Name:**	EN 1991-1-3 (Snow loads)
Proposed Task Phase:	**P2**	**Deliverable:**	Revised EN 1991-1-3 with additional clauses Background document(s)
Outline Task Scope:		Basis for calculation. Collection of available information on the implementation of the ground snow load maps, use and definition of exceptional ground snow loads and improvement of rules for the definition of roof snow loads, with specific regard to the local and global effects and buildings' dimensions. Guidance for NAs in view of further harmonization	
Starting documents:		Existing rules of EN 1991-1-3, state-of-the-art and NAs	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Ground snow loads	Collect snow load on ground based on existing national values and present the values in a snow load map emphasizing differences across borders and revealing the introduction of the exceptional ground snow loads to be dealt with accidental design situations.	-	The collection of available national snow maps allows putting in evidence the differences across borders, to serve as an input to NSBs for the possible further update of their maps, in view of a fully harmonised European snow map. More user friendly Eurocode. Basis for calculation of exceptional snow loads and improved guidance to NSBs to treat these effects in their NAs.	Improvement of EN 1991 through the refinement of NAs towards harmonisation at European scale. Modified clauses	✓
4	Snow loads on roofs	Shape coefficients; influence of building dimensions (e.g. flat and very large industrial buildings on the basis of current state of the art). Snow deposition patterns and accumulation on different roof structures, e.g. curved roofs and roofs with many local obstructions (on the basis of current state of the art). Influence lines with changing signs.	-	Basis for calculation. New basis for treatment of scale effects in large flat buildings. Basis for calculation. Some of the present rules will be improved on the basis of the current state of the art with specific regard to the local and global effects leading to consistent safe calculation procedures.	Modified clauses. New and modified clauses	✓
5	Snow loads; Editorial improvements	Editorial improvements.	Transfer of some clauses to EN 1990 (Undertaken/already done by the EN 1990 EG) - TCEN1990.T1	More user friendly Eurocode	Modified clauses	

Task Ref:	**SC1.T3**	**Task Name:**	EN 1991-1-4 (Wind)
Proposed Task Phase:	**P2**	**Deliverable:**	Revised EN 1991-1-4 with additional clauses Background document(s)
Outline Task Scope:		Improvement of consistency of the basis for calculations and new basis for calculations. Harmonization of the many different approaches used in the present Eurocodes with National Annexes. Potential harmonization of different Eurocode Parts and CENELEC standards for overhead electric lines, as well as other CEN or ISO standards. Possibly reduction of global wind loads leading to more economical structures.	
Starting documents:		Existing rules of EN 1991-1-4, state-of-the-art and NAs	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Wind actions: Wind map	Collect basic wind velocities based on existing national values and present the values in a wind map emphasizing differences across borders	-	The collection of available national wind maps allows putting in evidence the differences across borders, to serve as an input to NSBs for the possible further update of their maps, in view of a fully harmonised European wind velocities map. More user friendly Eurocode.	New clause	
4	Wind actions: Wind models	Wind models for calculation of wind velocities and peak velocity pressures including roughness categories and transition between roughness categories	-	Basis for calculations. Harmonization of the many different approaches used in the present Eurocode with National Annexes.	New and modified clauses in existing Eurocode	✓
5	Wind actions: Force and pressure coefficients	Systematic review and inclusion of force coefficients as well as internal and external pressure coefficients including influence areas/zoning based on the current state of the art and considering the national and experts' comments. The basis will be EN 1991-1-4, other Eurocodes Parts, e.g. for towers and masts, chimneys and other structures (e.g. lightweight) together with the wind response of such structures, CENELEC standards and other international codes. Considerations of the usability of the updated structure of Eurocode specifications for specialised structures.	-	EN 1991-1-4: Basis for calculation. Harmonization of the many different approaches used in the present Eurocodes with National Annexes. Other Eurocode Parts: establish consistent basis for calculations. Potential harmonization of different Eurocode Parts and CENELEC standards.	Modified clauses	✓
6	Wind actions: Dynamic response, vortex-induced vibrations, aeroelastic effects, bridges and response of structures	Additional rules for vortex-induced vibrations, aeroelastic effects, wind load on bridges and response of structures. Influence lines / mode shapes with changing signs.	-	New basis for calculation. Some of the present rules giving unsafe or uneconomical designs will be replaced by improved and more consistent calculation procedures. New basis for calculation. Consistent approaches leading to more economical structures.	Modified clauses. New clauses.	✓
7	Wind actions: Editorial improvements	Editorial improvements	Transfer of some clauses to EN 1990 (Undertaken/already done by the REN 1990 EG) - TCEN1990.T1	More user friendly Eurocode	Modified clauses	

Task Ref:	**SC1.T4**	**Task Name:**	EN 1991-1-5 (Thermal actions)
Proposed Task Phase:	**P2**	**Deliverable:**	Revised EN 1991-1-5 with additional clauses Background document(s)
Outline Task Scope:		Basis for calculations focusing on thermal responses (particularly for bridges) and clarification of the ranges of temperature to be considered. Harmonization across borders.	
Starting documents:		Existing rules of EN 1991-1-5, state-of-the-art and NAs	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Thermal actions: Temperature map	Collect characteristic temperatures based on existing national values and present the values in a temperature map emphasizing differences across borders.	-	The collection of available national minimum and maximum shade air temperature maps highlights the differences across borders, which then serves as an input to NSBs for the possible further update of their maps, in view of a fully harmonised European minimum and maximum temperature map. More user friendly Eurocode.	New clause	
4	Thermal actions: Bearings and joints	Characteristic values associated with the design of bearings and joints.	-	Clarification of the ranges of temperature to be considered	New clauses	✓
5	Thermal actions: Overall temperatures and differential temperatures	Interdependence of overall temperatures and differential temperatures.	-	Basis for design of structures (particularly bridges) susceptible to combinations of overall temperatures and differential temperatures. Clarification of the combinations related to characteristic values	New clauses	✓
6	Thermal actions:	Thermal response, i.e. effects of thermal actions on different structures.	-	Basis for calculations focusing on thermal responses	New clauses	✓
7	Thermal actions: Editorial improvements	Editorial improvements.	-	More user friendly Eurocode	Modified clauses	

Task Ref:	**SC1.T5**	**Task Name:**	Climate change
Proposed Task Phase:	**P1**	**Deliverable:**	Technical report analysing and providing guidance for potential amendments for Eurocodes with regard to structural design addressing relevant impacts of future climate change (general and material specific). Recommendations for modified or additional clauses for EN 1991-1-3, -1-4, -1-5 and EN 1991-1-9 (and possibly other Eurocode Parts). Background document(s)
Outline Task Scope:		Make use of the results obtained in many on-going research projects on climate change carried out all over Europe. Drafting of the synthetic report addressing the impact of climate change on climatic actions in relation to structural design issues. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1991-1-3, -1-4, -1-5, EN 1991-1-9, EN 1990 and state-of-the-art	
Justification for inclusion in Phase 1:		Many on-going research projects have documented important climatically changes. Using this information in the design of new structures will only have a small economic impact on the structural cost. Structural changes at a later stage will often be very costly. The primary focus is to include possible climatically changes in the design rules now in order to avoid future expensive structural changes due to climatically changes.	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Climatic changes	Developing a technical report analysing and providing guidance for potential amendments for Eurocodes with regard to structural design addressing relevant impacts of future climate change (general and material specific).	TCEN1990.T1	Make use of the results obtained in many on-going research projects carried out all over Europe	Recommendation for modified and new clauses	✓

Task Ref:	**SC1.T6**	**Task Name:**	Interdependence of climatic actions (wind, snow, thermal and atmospheric icing) and glass structure
Proposed Task Phase:	**P3**	**Deliverable:**	Additional clauses for EN 1991-1-3, -1-4, -1-5 and EN 1991-1-9 (and future Eurocode for Structural Glass) Background document(s)
Outline Task Scope:		Establishment of a well-documented background information for determination of relevant partial factors and load combination factors. Inclusion of necessary basis for calculation of responses from snow loads, wind actions and thermal actions on structural glass structures. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1991-1-3, -1-4, -1-5, EN 1991-1-9, EN 1990 and state-of-the-art	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Variability and interdependence of climatic actions: Probabilistic basis and load combination factors	Prepare document with the probabilistic basis for determination of partial safety factors and load combination factors. The document will also include discussions on load specifications based on characteristic values versus on design values. Establishment of an informative document in an appropriate form (e.g. a European Climatic Load Combination Map) for the load combination factors Ψ0, Ψ1 and Ψ2	SC1.T2 SC1.T3 SC1.T4 SC1.T8	Establish a well-documented background information for determination of partial safety factors. Differences across borders will be evident so that Member States will see the need to harmonize their basic climatic values. More user friendly Eurocode	Background document. New clause	✓
4	Structural glass structures: Snow loads, wind actions and thermal actions	Snow-loads (magnitude-time-functions) and combination with wind, temperature and air-pressure. Wind loads (magnitude-time-function); load assumption for short time for transient situations (repair by foils in case of spontaneous fracture), combination with temperature and air pressure. Temperature actions from air temperature, solar radiation and reflection of radiation, shadow effects (magnitude-time-functions).	SC1.T2 SC1.T3 SC1.T4	Inclusion of necessary basis for calculation of responses from snow loads on structural glass structures. Inclusion of necessary basis for calculation of responses from wind actions structural glass structures. Inclusion of necessary basis for calculation of responses from thermal actions on structural glass structures.	New clauses New clauses New clauses	✓

Task Ref:	**SC1.T7**	**Task Name:**	EN 1991-1-8 (Waves and Currents)
Proposed Task Phase:	**P2**	**Deliverable:**	Conversion of ISO 21650:2007 to EN-ISO 21650 Background document(s)
Outline Task Scope:		Incorporation of ISO 21650:2007 in the body of the EN Eurocodes. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		ISO 21650 and state-of-the-art	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Conversion of ISO 21650:2007 “Actions from waves and currents on coastal structures” to an ISO-EN standard	Incorporation of ISO 21650:2007 in EN Eurocodes.The main issues to be addressed are : (1) Redrafting of the ISO standard in a “Eurocode style”. This activity essentially concerns the forword and the introductory parts. (2) Considering any additional comments of the stakeholders following consultation (3) Decide whether some of the informative Annexes of the existing document, become normative. (4) Include, if relevant, up-to-date complementary information.	TCEN1990.T1	As a result the whole package of design of maritime works will become integral part of the Eurocodes family. Extension and updating of the ISO standard	New Eurocode Part	✓

Task Ref:	**SC1.T8**	**Task Name:**	EN 1991-1-9 (Atmospheric Icing)
Proposed Task Phase:	**P2**	**Deliverable:**	Conversion of ISO 12494:2001 to EN-ISO 12494 Background document(s)
Outline Task Scope:		Incorporation of ISO 12494:2001 in the body of the EN Eurocodes. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		ISO 12494 and state-of-the-art	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Conversion of ISO 12494 :2001 "Atmospheric Icing" to an ISO-EN standard	The initiative is mainly motivated by the progressive awareness and findings showing the importance of actions on structures due to atmospheric icing, especially for some type of structures (e.g. masts, towers, antennas, cables/ropes etc.) and in particular, but not only, for the Northern European Countries. On the other hand given that an ISO Standard, 12494 : 2001 refers to this topic, it is considered appropriate to use this standard to create an EN Eurocode, by transforming it accordingly and by introducing, where possible, more recent established, at an international and national level, research results. One additional reason for the initiative is improving simplification, given that some parts of the existing document are "textbook like". An additional issue which should be considered and handled appropriately is the up to now separate development by CLC/TC11 and further evolution of: o EN 50341-1:2001 "Overhead electrical lines exceeding AC 45kV - Part 1: General requirements – Common specifications". o EN 50423-1:2005 "Overhead electrical lines exceeding AC 1kV and including AC 45 kV - Part 1: General requirements – Common specifications" which are closely connected to actions due to atmospheric icing.	SC1.T2, SC1.T3 TCEN1990.T1	A known gap will be bridged with the development of actions due to atmospheric icing and their effects on various types of structures. The interdependence with wind actions will also be considered. An attempt will be also made to reach harmonization, as far as possible, with other standards, such as EN 50341-1 and EN 50423-1 Extension and updating of the ISO standard	New Eurocode Part	✓

Task Ref:	**SC1.T9**	**Task Name:**	EN 1991-2 (Road and rail traffic loads)
Proposed Task Phase:	**P1**	**Deliverable:**	Revision and extension of EN 1991-2 with addition of clauses Background documents
Outline Task Scope:	Extension of the scope of EN 1991-2 for road and railway bridges to include, respectively, LHV and additional train load models to cover the relevant TSI. Establishment of modified and simpler fatigue rules. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.		
Starting documents:	EN 1991-2, state-of-the-art and NAs		
Justification for inclusion in Phase 1:	SC1.T9.3 - The new TSI are currently under revision and there is an urgent need to include these requirements. SC1.T9.4 - The development of the European road traffic is going faster than expected and there is a strong need for new requirements to include all the aspects. SC1.T9.5 - Currently only a few requirements are specially defined for pedestrian bridges. It is necessary to work directly on this topic to include the available results of scientific studies in the standards, covering lacking information. SC1.T9.7 - Work is well in progress and could be included easily in EN 1991-2		

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Request by the ERA (European Railway Agency) for a revision of EN 1991-2	Extension of the scope of EN 1991-2 for railway bridges to include additional train load models to cover the relevant TSI (Technical Specifications for Infrastructures)	TCEN1990.T1	Basics for calculations, common methods for future needs. The "request for revision" of EN 1991-2 (and EN 1990–A.2) made by ERA, which mainly refers to the extension of the scope of EN 1991-2 for railway bridges to include additional train load models in order to cover and to be consistent with the relevant TS for Interoperability, under development by ERA and commissioned by the European Commission. More specifically: - cover the latest vehicles - especially fast heavy passenger multiple units with regular axle loads of 20 / 22.5t and 27 m length at speeds of up to 200km/h - accommodate future heavier and lighter Line Categories of train from concurrent update of EN 15528: 2008 (drafted by CEN/TC 256) - investigate potential incompatibility between vehicle requirements allowed for in HS RS TSI / HS INF TSI and Load Model HSLM in EN 1991-2 - check whether revisions to EN 1991-2 are necessary to ensure some shorter span bridges are not at risk from excessive dynamic effects including resonance.	New and/or modified clauses	✓

4	Road Traffic Evolution	Taking into account modern systems (LHV), incorporation of the results of international studies.	-	New load models for sustainable and economical constructions without restrictions. Collection of updated real traffic measurements around the Europe, especially those containing Long and Heavy Vehicles (LHVs) having total mass up to 60 t and total length up to 25 m, which could result very demanding for existing bridges and infrastructures.	New and/or modified clauses	✓
5	Pedestrian bridges	Providing special requirements and basic methods to calculate pedestrian bridges with their special needs including dynamic actions. Vibration problems already detected in some major pedestrian bridges need urgent consideration.	TCEN1990.T2 HG-B.T1	Basics for calculations, common methods for future needs.Incorporate the sate-of-the art of recent research	New chapter for EN 1991-2	✓
6	Fatigue models	Review of Road and Railway fatigue models in order to ensure sounder consistency of different bridge parts in the various relevant Eurocodes.	TCEN1990.T1 HG-B.T1	Consistent requirements in the different Eurocodes Review Railway Fatigue Load Models and approaches/methods, in order to ensure sounder consistency of different bridge parts of Eurocodes (in liaison with HG-B). Review of φ and α factors (related to dynamic behaviour and fatigue) Review Road Fatigue Load Models and approaches/methods, in order to ensure sounder consistency of different bridge parts of Eurocodes. Simplification by reducing the number of fatigue load models to be used.	New and/or modified clauses	✓
7	Aerodynamic effects on railway structures	Development of new and additional requirements for aerodynamic effects on railway structures including noise barriers and roofs due to severe damages in the last years (incorporation of recent results of international research and development).	HG-B.T2	Improved calculation methods for the stability of structures and sustainability of the system.	New and/or modified clauses	

Task Ref:	**SC1.T10**	**Task Name:**	EN 1991-4 (Silos and Tanks)
Proposed Task Phase:	**P2**	**Deliverable:**	Revised and additional clauses Background document(s)
Outline Task Scope:		Rational basis for the reliability assessment of silo loading combinations for different applications in EN 1990 and extension of the various rules for additional types of silos. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1991-4, state-of-the-art and NAs	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Transformation of the EN1991-4 Annex A load cases	The reliability of the silo pressure load cases depends on many factors that are currently completely missing from Annex A and its modified versions recently prepared for EN 1990. An extended discussion on this substantial problem was recently presented by Nielsen, Rotter and Sorenson (2012). This task involves establishing a new framework of categories on the basis of the descriptions given by Nielsen, Rotter and Sorenson (2012), and finding appropriate combination and partial factors to address each of the features. This will also involve the categorisation of silos according to the relative thickness of the silo walls; the aspect ratio of the silo; whether the silo is on-ground or elevated; silo operating conditions; and classification of a wide range of stored solids according to various features of their mechanical behaviour (abrasive or polishing potential, probability of segregation etc.).	TCEN1990.T1	Rational basis for the reliability assessment of silo loading combinations for different applications in EN 1990.	Significant restructuring of the Annex A in EN 1990 for silos and tanks	✓
4	Pressures on the vertical walls of silos that have an internal inverted cone	Very large silos (~10000 tonnes) used in the cement manufacturing industry have an internal inverted cone in the bottom for functional reasons. A significant number of these large silos have suffered severe damage or collapse, and this form of structure was consequently specifically excluded when EN 1991-4 was drafted (clause 1.1.2 (3)). However, a history of structural failures is surely a reason why this item should be covered by the standard, rather than excluded. It is important that rules to cover this widely used arrangement are developed and drafted into the standard. This task is one that has been waiting to be addressed since at least 1983 when the first (completely inadequate) design rules were put forward. It requires two simple theories to be devised and verified: one for symmetrical discharge, the other for local cyclic discharge through outlets in the internal inverted cone. The mechanics basis for the symmetrical theory exists, but it needs verification. The development of a suitable local discharge model will require more time.	-	This will be the first regulation of the required design pressures for cylindrical silos with an internal inverted cone. Such silos are currently being constructed all over the world (e.g. China, India, Egypt), often to Eurocode rules. The inclusion of such rules would reinforce the perception that European standards have a leading role worldwide.	New section required	✓

5	Pressures in rectangular silos with flexible walls	If rectangular silo walls are required to sustain the full force of the pressures exerted on a rigid surface, the walls become very heavily constructed, with deep stiffeners needed to act as big beams, However when the walls are flexible, the pressures in the stored solid are redistributed towards the container corners, leading to much smaller pressures on the walls. The result is that much lighter containers can be constructed if the walls are flexible, which they can be if the pressures are lower. This meretricious circle has not been exploited yet, but the research on which it is based has been available for some years. It should be covered by rules in the standard. As noted above, suitable data for the definition of pressures on the walls of flexible-walled rectangular silos exists. A small range of tests have been used to verify a slightly wider range of computational predictions. It is not proposed to extend the computational or experimental work, but the existing results must be generalised so that they can be applied to a usefully wide range of materials. This requires definition of the stiffnesses of many solids, and a characterisation of the free parameters in terms of known material properties (e.g. lateral pressure ratio, frictional properties, density).	-	Rectangular storage containers pose significant advantages to plant owners where limited footprint space is available (e.g. on offshore platforms, or in congested industrial sites) or where flat-plated structures are cheaper to manufacture than curved sheet shells. This new development will make rectangular containers lighter and more cost effective. Companies storing large quantities of solids in restricted areas will be the beneficiaries.	New Section in 5.7 and amendments to 5.1 and 5.2	✓
6	Discharge pressures on vertical silo walls subject to highly eccentric flow channels	Outlets that are eccentric to the centreline of a silo are often necessary for functional reasons, and silos that are completely geometrically axisymmetric sometimes experience eccentric flows. The pressures caused by eccentric flow are very damaging indeed. A new regulation was introduced in EN 1991-4, which imposes very severe demands on the structure. This revision of the new rule will seek to make this rule more discriminating, so that its severe demands are limited to those cases where they can be shown to be necessary. But that is a challenging task given the current state of scientific knowledge on granular solids flow. The only known mechanics theory for eccentric discharge pressures was implemented into EN 1991-4 (2006). It has now explained many failures, but is too onerous for the general case. This project requires that a sufficiently simple approximate theory to predict flow channel geometries is devised, followed by a simplification of the existing theory of pressures under such regimes. These are two challenging problems to solve, but a first attempt must be made to make the standard more usable for silos that are not subject to the very worst pattern of loading. The new model should reduce the required metal wall thickness by a factor of perhaps 3, and should greatly reduce reinforcement requirements in reinforced concrete.	-	All silo owners who either need to use eccentric outlets or who have reason to fear that the solids in their silos may occasionally flow eccentrically will be the beneficiaries. Such situations sometimes arise suddenly after years of successful service due to segregation, thermal or hygral differentials, impacting sunlight and similar factors.	Modified clause 5.2.4.3	✓
7	Pressures in unsymmetrical conical hoppers	Unsymmetrical circular hoppers are widely used in agricultural applications because of their functional advantages, but they are currently restricted to very small structures because little is known about the pressure regime or the structural behaviour. They are specifically excluded from EN 1991-4 in 1.1.2 (7). This project will address this situation and permit a wider use of unsymmetrical hoppers, giving significant functional advantages in bigger silos.	-	The beneficiaries will be the owners of larger silos who must currently use expensive handling systems to achieve concentric flow from a hopper. This is a structural innovation that can greatly reduce materials handling costs.	New Section in 6	
8	Overpressure factors for silos under mixed flow	EN 1991-4 defines clearly the different patterns of concentric flow that may be expected in a silo. For one of these, mixed flow, the pressure regime during discharging solids is not defined in EN 1991-4, though it can lead to much higher pressures in one location and lower pressures in others. This case should be properly documented and the design requirements modified for mixed flow design situations. Solids in silos discharge in mass flow, internal flow or mixed flow. The pressures on the walls are very different according to the flow pattern, but this is largely ignored in EN 1991-4. In particular, new theories, correlated with test results, should be used to define the very high local pressures occurring on the walls of mixed flow silos at the transition from flowing to static solid. It is hoped that a first simple rule can be devised for trial in a relatively short time.	-	Benefit: More robust and secure designs for mixed flow silos, which are commonly found where the headroom is limited or where the stored solid particles are susceptible to damage by being dropped from a great height (e.g. agglomerated particles, compressed pellets).	New clauses in 5.2.2	✓
9	Tangent modulus of a particulate solid	The stiffness of a particulate solid has a significant impact on the loads incurred by differential temperatures (external atmospheric cooling of the structure shrinking onto a warm solid), on the pressures in flexible-walled rectangular silos, and on the buckling strength of thin metal silos. Recent research has shed much light on the quantification of this tangent modulus, which depends on both the pressure state in the solid and measurable properties of the solid. This property has an impact on thermal loads, loads due to swelling, and the frightening phenomena of silo quaking and honking. The existing database of tests on the stiffness of particulate solids stored in silos must be reviewed with care by persons who have not been involved in its development, and further simple tests are needed on solids that have not been tested. The stiffness is stress-dependent, and not easily predicted using other properties that are commonly measured (e.g. frictional properties, densities etc.). Funding is sought to extend the database and to verify the model proposed for inclusion in the standard.	-	Design situations in which load combinations involve thermal loads are greatly affected by the stiffness of the stored solid. The values of combination factors in EN 1990 have a much smaller impact on the final design than this stiffness effect, because hard roundish particles and soft long particles have stiffnesses that differ by several orders of magnitude. In addition, the buckling strength enhancement from solids stiffness in metal silos (EN 1993-4-1) can only be exploited if this provision is included in EN 1991-4.	New/modified Section 4 and Annex C.10.2	✓

10	Thermal differentials producing actions in silos of different geometries	Thermal differentials between stored solids and the containing structure arise due to changes in the weather (the large mass of solids is thermally stable). The current provisions in EN 1991-4 assume that the solid is vertically constrained against movement. This may be a good model for slender structures, but it is very inappropriate for squatter geometries, where the solid can be vertically displaced by external pressure. A new theoretical model is needed and should be introduced into the standard. Huge overpressures are induced in silos when thermal differentials develop between the thermally inert stored solid and the exposed structure. A small amount of funding is sought to permit the devising of a new theory for the consequences of thermal differentials. This theory must accommodate different silo aspect ratios where the phenomena change. It is planned that this model will be simply verified against computational predictions to provide a basis in mechanics.	-	Benefits; This project addresses design situations in which thermal differentials are predicted to produce great increases in pressures, indicating that bursting failures are possible. Often the current rules lead to predictions that practical engineers find not credible. This is damaging to the credibility of the whole standard.	New Section 7	✓
11	Eccentric discharge in a symmetrical hopper under eccentric flow in a cylinder	The eccentric discharge flows noted in Item 3 above also have a major impact on the hopper structure beneath the silo. The current standard makes no provision for such pressures, and an appropriate rule must be devised. Damage to the ring supporting the hopper is a common feature of eccentric flows in hoppers.	-	This provision will ensure that designers take into consideration the effects of eccentric discharge flows on both the hopper structure and the ring from which it is supported. The benefit will be the elimination of another failure mode in these structures.	Modified Section 6	

Task Ref:	**SC1.T11**	**Task Name:**	Evolution of existing parts of EN 1991 not included in the other tasks
Proposed Task Phase:	**P4**	**Deliverable:**	Revised EN 1991-1-1, EN 1991-1-6, EN 1991-1-7, EN 1991-3
Outline Task Scope:		Reduction of NDPs and enhancement of 'ease of use' in line with requirements of Mandate M/515	
Starting documents:		EN 1991-1-1, EN 1991-1-6, EN 1991-1-7, EN 1991-3	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.		Reduced national variation and improved ease of use of the Eurocodes.	Modified clauses.	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.		Improved ease of use of the Eurocodes for practical users.	Modified clauses.	✓

Task Ref:	**SC2.T1**	**Task Name:**	New Items in EN 1992-1-1, EN 1992-2, EN 1992-3.
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and technical background documents resulting in new clauses for design of Concrete Structures: general rules and rules for buildings, Concrete Bridges /Design and Detailing rules, Liquid Retaining and Containment Structures
Outline Task Scope:		Harmonization, with consequent reduction of NDP's. Updating of some design rules taking account of scientific development since 2004 in the field of concrete structures, particularly respect to durability; to existing structures and to new materials, with the scope to address the designer to a better fulfillment of sustainability. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1992-1-1, EN 1992-2, EN 1992-3 and EN 1992-1-2, considering available literature from international technical organisations as e. g. fib	
Justification for inclusion in Phase 1:		The unfunded tasks should start early, they are not necessarily following the stepwise progress.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies (Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Durability	Design for durability, as one of the main parameters of sustainability, should be improved, introducing in EN 1992 the results of advanced research already codified in ISO 16204 and pre-normative codes, like the fib Model Code for Service Life Design. The work done within the Joint Group TC250/SC2 and TC104/SC2 is preparing a new approach to design for durability based on the harmonization of rules in EN 1992's in EN 206 and in EN 13670. The conflict sometime present in those codes will be eliminated and simpler and harmonized design rules will be provided. It is likely that the main frame of this new approach will be ready in a short time, serving as input for the SC2/WG1 activity.	Joint Group is established between TC250/SC2 and TC104/SC2	The main benefit of this action is the improvement of design for durability, based on a more rational approach and consistent with the issues of other relevant TC's like TC104. TC250/SC2 is having a Joint Working Group with TC104/SC2 with also representation from TC229. The output from this JWG will be coordinated rules between EN 1992 and EN 206. The new concept will hopefully reduce/remove the need for the large variations in requirements between the countries and hence improve harmonisation across Europe. Improving the durability helps fulfil sustainability requirements.	New text in main Part plus coordinated revisions in EN 206	
4	Design by non linear F.E.M.	Design / verification by use of non-linear Finite Element Method (F.E.M.) is expanding in professional practise, but there is a lack of codified rules, particularly important in case of concrete, which is a composite material showing a softening branch after peak load, and with different material factors for concrete and reinforcement and thus tension and compression failure. The present gap in concrete codes can allow the design and construction of very unsatisfactory and unsafe structures. A modified chapter and a new Annex will be produced, containing a guidance in use of N.L. F.E.M. with a clear orientation to the specific problems that can be usefully dealt with such tool.		A new set of codified rules for use of Non-linear F.E.M. in design and verification will produce functional and safe structures and, at the same time, saving in use of construction materials.	A modified chapter and a new Annex will be produced, containing a guidance in use of non-linear F.E.M. with a clear orientation to the specific problems that can be usefully dealt with such tool.	
5	Size Effect	The extensive realization of large structures implies the need for the improvement of size effect consideration in some areas, like punching (thick and large foundation slab) and plastic rotation (large bridge deck). Available experimental research results and new modeling by fracture mechanic can allow to introduce in a more rational way this parameter in design rules.	-	A more rational and extensive treatment of size effect on punching resistance and plastic rotation will orient the design rules to a more safe and sustainable design.	New modified rules will be produced for the consideration of size effect in design for punching and for the evolution of plastic rotation in large structures. Possibly new Annex for bridges.	
6	Stinless Steel Reinforcement	The use of stainless steel reinforcement, in case of severe environmental conditions, to improve the durability has to be subjected to specific design rules. Aspects to be investigated and codified are the constitutive relationship, the thermal properties with high and low temperatures, the fatigue resistance.	Work with ECISS TC104	The benefit will be appreciated in safe design for ULS, also with extreme temperatures, and in design by avoidance in durability aspects.	New implemented chapters on materials will be produced in EN1992, accounting for the relevant mechanical, physical and chemical parameters of stainless steel.	✓

7	Assessment of existing structures	A first item is the necessity to clarify the applicability of design models used for new structures to the existing ones and, when necessary, to introduce new models able to describe the behaviour of damaged and undamaged existing structures: it is the case for instance of bond / ductility / resistance degradation by corrosion and consequent design rules for ULS, or of membrane effects able to increase the structural resistance respect to the rules today used for new structures. This work item is relatively new, prenormative codes deal with existing structures only in general terms (fib established a special Activity Group since only three years) and the few available normative codes deal with the subject also with a very general approach; on the opposite the work item of this point is the production of verification) design rules enough detailed to permit the actual verification of safety level, also in relation with the residual life, within the semi probabilistic approach, live described in EN 1990.	WG2	A careful evaluation of existing structures will be possible, with important issues both on the safety / functionality and on the actual necessity of intervention for upgrading /repair. Consequently a more sustainable approach to the existing structures use will be achieved.	New Annex with design / verification models will be introduced in the code and new resisting mechanism will be envisaged to define in a comprehensive approach, the actual structural behaviour.	✓
8	Strengthening with FRP	Repair and strengthening by use of materials with a polymer matrix reinforced with long glass, carbon or aramide fibres (FRP) is becoming a widespread technique in existing structures. There is then a need to produce design rules based on the available experimental and theoretical available studies. FRP presents a very good resistance to the corrosion and then in some specific areas their use can be a very suitable solution for the strengthening of damaged structures.	-	The main benefit will be the rationalization of use of FRP in strengthening of existing structures, by means of a comprehensive approach based on the definition of resisting models addressed to the evaluation of safety / functionality, durability and robustness of such type of intervention.	A new Annex that address to the conceptual design and use of FRP for structural strengthening and a set of rules, both for ULS and SLS, able to give rise to safe and economical design for strengthening.	
9	Fibre Reinforced Concrete	Addition of fibres to enhance the mechanical and thermal properties of concrete is today a common practise, there is then the necessity to introduce in EN 1992 relevant design rules, consideration taken to all the fields in which fibres can be usefully added to concrete: improvement of SLS, ULS resistance, fire resistance with limitation of spalling.	-	A beneficial technique, the use of fibres, for the structural performance will be finally considered in a rational frame by means of design / verification rules for all relevant limit states. The use of fibres will improve the structural performance in a very sustainable approach.	The relevant parts of EN 1992 will include new rules for the verification / design of concrete structures containing metallic and non metallic fibres/ respect to the relevant limit states in the main text and a new Annex. Robustness will be also considered.	
10	Early age thermo-mechanichal design	Early cracking due to thermal stresses from the heath of hydration and restrained contraction is a problem in massive structures provisions for the design to avoid such problems are intended covered in a new Annex.	-	Cracking of massive concrete sections during hardening is a problem, that will be given a methodology to handle.	New Annex	

Task Ref:	**SC2.T2**	**Task Name:**	New Items in EN 1992-1-2
Proposed Task Phase:	**P2**	**Deliverable:**	Scientific and Technical background documents resulting in new clauses for design of concrete structures: general rules - structural fire design
Outline Task Scope:		Harmonization, with consequent reduction of NDP's. Updating of some design rules considering the scientific development in the field and integration with consideration of additional typologies of concrete structures currently used in practise. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:			

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Fire resistance	A part some improvements necessary in EN 1992.1.2 related to the consideration of the resistance of non braced columns (very typical solution), a more general address of the design to the overall structural behaviour is necessary, so bridging the robustness criteria and the fire structural engineering methods. The concept to analyze the structure at overall level in strict connection with the robustness criteria requires a strict relation with other bodies internal and external to CEN; the recent work of JCSS on the robustness subject and some advanced researches like "Coast", together with fire structural engineering methods, will help in defining the scenarios that should be taken into account and the related safety margins.	-	A lack in EN 1992.1.2 will be filled by specific rules related to non-braced columns; additionally a fundamental bridge will be established between structural behaviour under fire and structural robustness. A more consistent, integrated and safe design will be achieved under fire conditions.	New design rules will be added to EN 1992.1.1; a new chapter giving address and rules for the structural overall behaviour in presence of fire will be necessary.	✓

NOTE

1. The SC2 response has been developed by the Sub-committee with the aim of avoiding too much detail. It is understood that other activities are planned by SC2, and therefore the complete SC2 work programme is not necessarily shown. However, any additional activities would fall outside the scope of any Contract with the EC.

Task Ref:	**SC3.T1**	**Task Name:**	Design of Sections and Members according to EN 1993-1-1
Proposed Task Phase:	**P1**	**Deliverable:**	Revised EN 1993-1-1 Background documents
Outline Task Scope:		As rules in EN 1993-1-1 had to cover very different national design practices with different levels of sophistication there are a number of approaches given as alternatives in the existing code. In order to enhance ease of use and improve the readability and accessibility, a restructure with revised and simplified design rules based on an evaluation of the existing code rules is foreseen and will lead to a reduction of alternatives. They especially relate to certain parts of the chapters 5 and 6 in EN 1993-1-1 on cross-section classification, rules for cross-sectional resistance and stability resistance, imperfections to be used in the design in relationship with execution tolerances. Also, for applications such as bridge girders, runway beams or cellular beams harmonization will be achieved by modifying and adding design rules not yet available in EN 1993-1-1. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical. Based on an evaluation of all available NAs, the task aims at reducing the number of NDP and NCI. As EN 1993-1-1 contains the general rules and forms the basis of all other parts therefore evolution has to start at an early stage so that the other parts EN 1993-1-1 can refer to.	
Starting documents:		EN 1993-1-1 and its available background documents. Scientific papers published in journals like Journal of Constructional Steel Research. Literature and research documents produced by members of Research Committee ECCS-TC8 “Stability” and recent results of RFCS-research.	
Justification for inclusion in Phase 1:		Due to the typically slender way of steel construction, almost all parts of EN 1993 cover stability and buckling problems and related items such as the question of imperfections and execution quality. One main aspect of the improvement of EN 1993 will therefore be - in a very first step - the simplification, harmonization and improvement of basic assumptions and design rules with regard to general stability issues. This item is of vital importance of the further evolution of all parts of EN 1993. To achieve a harmonization of design rules across the various parts of Eurocode 3 such as EN 1993-1-5, EN 1993-1-8 and EN 1993-1-3 a revision of certain design rules such as cross section classification and stability issues will be realized. This aims at minimizing ambiguities and simplifying the design and influences the further development of the other parts of Eurocode 3. For construction of steel works, the overall safety level of steel structures depends quite much on the combination of wind and snow loads and the type of failure: plastic collapse or stability failure. As the former issues differ quite much within the whole of Europe, the safety values γ_M require a re-evaluation in order to allow for a consistent safety level within all member states. This is a key issue that has to be done as a first step within the evolution and further development of all parts of EN 1993. Coordination and harmonization of buckling rules for extended applications such as cellular beams or large plate girders for bridges or crane supporting structures has to be dealt in a first phase in order to have clear rules for further development of all application parts. This will also help to avoid any doubling of rules in the application parts. Lateral torsional buckling is one of the most important aspects affecting the design of steel girders in general. The existing version of EN 1993-1-1 includes many different and partially quite sophisticated rules regarding lateral torsional buckling (LTB) of typical girders. A simplification of these rules is of great importance regarding the daily use of EN 1993-1-1. This needs to be solved in the first phase within the evolution of EN 1993.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Imperfections and tolerances	Development of consistent allowance for structural imperfections and specification of tolerances with regard to the buckling resistance of members especially columns. Set-up of consistent imperfections allowances for global analysis of frames.	None required in advance Is related to SC3.T3, SC3.T4, SC3.T5, SC3.T11	Due to the typically slender way of steel constructions, almost all parts of EN 1993 cover stability and buckling problems and related items such as the question of imperfections and execution quality. One main aspect of the improvement of EN 1993 will therefore in a very first step the simplification, harmonization and improvement of basic assumptions and design rules with regard to general stability issues. This item is of vital importance of any further evolution of all parts of EN 1993.	New and modified rules in EN 1993 regarding buckling issues, tolerances and imperfections.	✓
4	Re-evaluation of the safety value γ_M	Simplification and clarification of rules with regard to the partial values γ_{M0} and γ_{M1} within the several parts of EN 1993 in accordance with EN 1990.	None required in advance Is related to TCEN1990.T1	This will allow for a consistent safety level within all member states in buildings and civil engineering structures. Incorporation of results of international recent studies, from RFCS projects in particular.	New and modified rules in EN 1993 regarding safety values γ_{M0} and γ_{M1}	✓

5	Classification of cross-sections	Improvement of cross-section classes in order to guarantee continuity between the existing 4 classes Adjustment and coordination with rules given in EN 1993-1-5 (effective width method and reduced stress method) and EN 1993 1 3.	None required in advance Is related to SC3.T3, SC3.T4, SC4.T7	The classification system of members into 4 cross section classes is a key issue within the whole Eurocode 3. Harmonization of design rules across the various parts of Eurocode 3 such as EN 1993-1-5, EN 1993-1-8 and EN 1993-1-3 in order to minimize ambiguities and simplify the design by improved clarification.	New and modified rules in EN 1993-1-1, EN 1993-1-3, EN 1993-1-5, EN 1993-1-6	
6	Improvement and simplification of buckling rules for extended applications	Improvement, simplification and harmonization of buckling rules for extended applications such as: - cellular and castellated beams (in cooperation with SC4 and HG Fire) - large plate girders, e.g. for bridges or crane girders	None required in advance Is related to SC3.T4, SC3.T6 SC4.T2, SC3.T10 and SC3.T11 are dependent on	The application of the existing buckling rules derived on simple systems needs a modification in order to allow an adjusted and simple use for special cases such as cellular beams in building constructions that reflects a large market in the overall steel work. Similar improvements and harmonization are required for large plate girders.	New or revised rules in EN 1993-1-1, EN 1993-1-2, EN 1994-1-1 New or revised rules in EN 1993-1-1, EN 1993-2	✓
7	Simplification of lateral torsional buckling rules for cold and fire design	For the cold design, the existing version of EN 1993-1-1 includes different and quite sophisticated rules regarding lateral torsional buckling (LTB) of typical girders. A simplification of these rules is of great importance regarding the daily use of EN 1993-1-1. Furthermore a modification of lateral torsional buckling in EN 1993-1-1 is required regarding the fire design according to EN 1993-1-2 in order to simplify the design.	None required in advance SC3.T10 and SC3.T11 are dependent on Is related to SC3.T6	Simplification of lateral torsional buckling rules for cold design is a clear need addressed by many practitioners. An improvement of fire design rules resulting from a liaison with the Horizontal Group Fire will lead to a reduction in the number of nationally determined parameters.	Simplified and revised rules in EN 1993-1-1 Revised rules in EN 1993-1-2	✓
8	Shear and torsion	Simplification of rules for shear and torsion.	None required in advance SC3.T10, SC3.T11 and SC3.T5 are dependent on	The current rules are difficult to apply in practice. Simplification of the rules for shear and torsion is requested by many practitioners.	Revised rules in EN 1993-1-1	
9	Development of guidance for the selection of execution classes	Further investigation on the assumptions presumed in design regarding execution in order to further develop the Annex C for the selection of execution classes in accordance with EN 1090-2 and in collaboration with TC135.	None required in advance All parts are dependent on	Coordination of design rules resulting from liaison with the corresponding code group for execution in TC 135 to achieve a consistent approach between design rules and execution rules.	Revised rules in EN 1993-1-1 Coordination of rules in EN 1090-2	

Task Ref:	**SC3.T2**	**Task Name:**	Joints and Connections according to EN 1993-1-8
Proposed Task Phase:	**P1**	**Deliverable:**	Revised EN 1993-1-8 Background documents e.g. concerning bolted connections, welded connections and component method.
Outline Task Scope:		As EN 1993-1-8 contains the basic rules for connections and joints which are essential for all steel structures, the design rules of most of the other parts depend on the rules given in EN 1993-1-8. Therefore the necessary changes in EN 1993-1-8 have to be made at an early stage to be considered by the evolution of the other parts. For simplification of EN 1993 rules originally given in EN 1993-1-12 for high strength steels will be integrated and further developed. Harmonization of connection rules between EN 1993-1-8 and other parts such as EN 1993-1-3 Cold formed members and sheeting and EN 1993-1-2 Structural fire design will be realized. In order to enhance the ease of use the rather complex rules of the component method for joints will be revisit and modifications developed. General improvement of design rules in view of durability and robustness. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical. Based on an evaluation of all available NAs, the task aims at reducing the number of NDP and NCI.	
Starting documents:		EN 1993-1-8 and its available background documents, EN 1993-1-12 Scientific papers published in journals like Journal of Constructional Steel Research. Literature and research documents produced by members of Research Committee ECCS-TC10 "Structural Connections" and recent results of RFCS-research.	
Justification for inclusion in Phase 1:		European harmonization of existing diverse practice for modern joint connections e.g. blind hole connections and contact joints by extending the existing design rules. This has to be solved at an early stage because influence on stiffness and resistance has to be considered in other parts of EN1993. In order to integrate the rules in EN 1993-1-12 for steels up to S700 it is necessary to consider the filler metal in the verification. Clear rules are needed for mixed connections of high strength steels and mild steels. Integration of advanced knowledge for the design rules of fillet welded connections in order to allow for mixed steels connection (High strength and mild strength steels) considering also mismatch-effects. This integration has to be realized at an early stage because other parts of EN 1993 depend on basic verification of welding Joints are a vital part of the whole constructional steel work directly affecting all parts of EN 1993. The further development of the component model for the design of joint is therefore a general key issue within the further development of EN 1993, which has a strong influence to the overall robustness and safety of all steel construction works. Other parts of EN 1993 also of EN 1994 depend strongly on a consistent and easy to use solution which therefore has to be drafted in the very first phase. Both welded and bolted connections reflect the main jointing technology for steel structures. Harmonization and clarification of the design rules in EN 1993-1-8 with the existing execution rules as given in EN 1090-2 is needed. This is a precondition for development of further parts such as EN 1993-1-9 and has to be treated in a very first phase as this will directly affect especially the application parts. Adjustment of component model for column bases with recent results on fastening techniques in order to harmonize and simplify the design approach especially at the interface between different materials in cooperation with SC2. It is important to have an early adjustment with rules in EN 1992 for fastening technique which are under recent revision to prevent a further mismatch.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Extension of design rules for modern joints and connections	Extension of design rules for modern joint connections used in building works: - joints of blind hole bolted connections e.g. for tubular sections - contact joints in general steel building constructions	None required in advance Is related with SC3.T1	Increase of the use of tubular sections through modern blind hole bolted connections in building frames where the influence of architects is dominant. Simplification of joint design through the allowance of contact joints	Additional and modified rules in EN 1993-1-8.	✓
4	Stainless steel bolted connections	Extension to guidance on bolted connections for stainless steels.	None required in advance SC3.T7 is dependent on	Innovative design rules in view of durability and robustness	Additional and modified rules in EN 1993-1-8 and EN 1993-1-4.	

5	Extension of design rules for welded joints and for mixed steels connections	Integration of advanced rules for the static and seismic design of fillet welded connections in order to allow for mixed steels connection (high strength and mild strength steels) considering also mismatch-effects.	None required in advance Is related to SC3.T1, SC8.T3 and SC3.T13	Allowance of ductile and robust joint behaviour by considering the filler-metal as such including also undermatching filler-metal. This is a key issue for the static design as well as for the in seismic design. Incorporation of recent results of RFCS projects and other relevant National, European and International projects.	Additional and modified rules in EN 1993-1-8. Coordination with rules in EN 1998-1.	✓
6	Further development of the component models for joints in order to increase the robustness of joints.	According to EN 1993-1-8 joints of steel structures are designed using the component model to determine the distribution of forces and moments. To enhance ease of use, further development of these design rules will cover following aspects: -Simplification of design rules for standard joint solutions - the use of 3D-modelling - the use of high strength steels as e.g. given in EN 1993-1-12 and - the specification of the necessary and available deformation (rotation) capacity for the joints. This enhancement of the design rules for joints using the component models will strengthen the allowance for robustness by ensuring overall ductile behaviour.	None required in advance Is related to SC3.T1, SC3.T11 and SC3.T13	The benefit of this action is that the design of structures can also be done using 3D-modells for joints and/or the use of high strength steels that becomes more and more important. By these additional rules the designer can prove that the structure is sufficiently ductile without sophisticated verification.	Additional and modified rules in EN 1993-1-8	✓
7	Integration of design rules for advanced material	The existing design rules are predominately based on traditional mild steel grades. Harmonization of application rules in practice will be achieved by investigation and extension of these rules also for advanced new material such as: - cast iron - steels for quenching and tempering - alloyed steel - high strength steel.	None required in advance Is related to SC3.T1 and SC3.T13	The development of design rules for joints that are specifically adapted to the characteristics of new advance materials will allow for a straight forward and safe use of these new materials. The overall safety of building is especially governed by the local joint behaviour. The integration of advanced design rules for connections in combination with new materials increases the overall robustness and durability which is one of the key-point of sustainable engineering. A better use of natural resources through a more efficient use of material by improved and innovative design rules for joints and connections.	Additional and modified rules in EN 1993-1-8 and EN 1993-1-1	
8	Hollow section joints	Adaption and integration of new research results for hollow section joints based on the most recent CIDECT guidelines.	None required in advance	Adaption and integration of new research results for hollow section joints based on the most recent CIDECT guidelines.	Additional and modified rules in EN 1993-1-8	
9	Clarification and specification of the application of EN 1090-2	Clarification and specification of design rules given in EN 1993-1-8 with execution rules given in EN 1090-2. This will cover welded connections, bolted connections, product standards for bolts and tightening methods for bolts. One key aspect is also the specification of execution classes for welded structures (together with revision of ISO 5817) and clarification with the rules given in EN 1993-1-9.	None required in advance Is related to SC3.T1 and SC3.T8	Harmonization of design rules given in EN 1993-1-8 with the execution rules given in EN 1090-2.	Additional and modified rules in EN 1993-1-8 and EN 1993-1-9	✓
10	Component model for column base plates	Adjustment of component model for column bases with recent results on fastening techniques in order to harmonize and simplify the design approach especially at the interface between different materials in cooperation with SC2.	None required in advance Is related to SC2.T1	Harmonization and further development of design criteria at the interface between steel and concrete Incorporation of recent results of RFCS projects and other relevant National, European and International projects.	Additional and modified rules in EN 1993-1-8 Coordination with rules in EN 1992-1-1	✓
11	Fire safety of joints	Harmonization of rules on the fire safety of joints and connections with EN 1993-1-2 in liaison with the HG Fire.	None required in advance Is related to SC3.T6	Harmonization of rules for cold and fire design of joints	Additional and modified rules in EN 1993-1-8 and EN 1993-1-2	

Task Ref:	SC3.T3	Task Name:	Cold-formed members and sheeting - Revised EN 1993-1-3
Proposed Task Phase:	P2	Deliverable:	Revised EN 1993-1-3 Background documents
Outline Task Scope:			Based on an evaluation of all available NAs, the task aims at reducing the number of NDPs and NCCI. Harmonization of member buckling rules with EN 1993-1-1 and EN 1993-1-5. Enhanced design rules cold-formed members and sheeting with regard to bearing design and stabilization issues. Strengthening of robustness and serviceability items for cold-formed members and sheeting and their connections. Harmonization and simplification of design rules for connections in accordance with EN 1993-1-8. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.
Starting documents:			EN 1993-1-3 and its available background documents, existing national codes such as DIN 18807 Available technical publications, experimental and theoretical research reports e.g. by ECCS TC7

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Harmonization of member buckling rules	EN 1993-1-3 covers cold-formed mainly thin-walled members that buckle locally as well as globally. Verification rules differ slightly from global member buckling according to EN 1993-1-1 and local buckling according to effective width method in EN 1993-1-5. Modifications and changes have to be coordinated in order to achieve an utmost harmonization.	First results of modifications in SC3.T1 Related to SC3.T1 and SC3.T4	Harmonization of these 3 codes dealing with different but similar buckling phenomena will decisively ease the use for the application in practice.	Modified rules in EN 1993-1-3	✓
4	Continuity connection of sheeting at intermediate supports	The continuity of sheeting by overlapping and sleeve connections is not covered by the EN 1993-1-3 although this very advantageous device is required by building industry.	None required in advance	Improvement of general bearing design of cold formed members and sheeting	Modified rules in EN 1993-1-3	✓
5	Bearing design of the sheeting and cold formed sections	Improvement of bearing design for: - sheeting supported by cold-formed section with one web (i.e. commonly used Z, C and Sigma purlins) and - cold-formed sections under local transverse forces Harmonisation of interaction rules under combined bending, axial compression and shear force close to bearing. Especially for sheeting.	Related with SC3.T4	Improved design rules at bearing situations. Harmonised interaction rules at bearings.	Modified rules in EN 1993-1-3	✓
6	Sheeting under local concentrated and patch loading	Sheeting under local patch loading, generated by photovoltaic systems. Eurocode 3 Part 1-3 does not cover these new applications in cladding and roof resulting from the demands made by sustainable development.	Related with SC3.T4	This is the green and ecologic aspects of the essential requirement of the RPC that should be added in Eurocode	New rules in EN 1993-1-3	
7	Walkability of sheeting	The evaluation of walkability of sheeting is necessary to ensure the safety during construction stage. The EN 1993-1-3 does not treat this aspect.	None required in advance	Improving the overall robustness and serviceability conditions	New rules in EN 1993-1-3	
8	Stabilization with sandwich panels and sheeting	The sandwich panels and sheeting are often used as stabilization elements. EN 1993-1-3 will be enlarged in order to take this effect into account for: - sandwich panels and - sheeting used as diaphragm and related issues e.g. the introduction of concentrated loads.	None required in advance Is related to SC3.T1	Enlargement of design rules Harmonisation with product standards	New rules in EN 1993-1-3	
9	Resistance of screws and bolts loaded in shear	Harmonisation and enlargement of design rules for screws and bolt loaded in shear.	Related with SC3.T2	Harmonisation of design rules with EN 1993-1-8 Enlargement of rules	New rules in EN 1993-1-3	✓
10	Review of Annex D	Modified buckling curve for out stand elements	None required in advance	Improvement of buckling analysis for out stand elements and thin-walled sections including out stand elements.	Modified Annex D	✓

Task Ref:	**SC3.T4**	**Task Name:**	Stability of Plated Structural Elements - Revised EN 1993-1-5
Proposed Task Phase:	**P2**	**Deliverable:**	Revised EN 1993-1-5 Background documents.
Outline Task Scope:		EN 1993-1-5 contains the basic requirements for the stability for slender plated elements, frequently used in large spanned building structures, bridges, large crane runway girders or similar. It is therefore important for the harmonization within EN 1993 to develop this part in an early stage compared to the application parts of EN 1993. As EN 1993-1-5 is related to many other basic parts of Eurocode 3 such as EN 1993-1-1, EN 1993-1-3, EN 1993-1-6, EN 1993-1-7 a harmonization of the various stability design rules is intended in order to minimize ambiguities and to simplify the design by improved clarification. A harmonization of design rules is also foreseen regarding the execution of slender plated elements with regard to imperfections that are covered in EN 1090. This tasks also aims at integrating recent results of international studies from RFCS projects in particular regarding extended girder applications such as tapered girder, hybrid girders etc. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1993-1-5 and its available background documents and National Annexes. Research reports such as RFCS research project COMBRI+: Valorisation of Knowledge for Competitive Steel and Composite Bridges, Final Report. Several working documents from ECCS-TWG 8.3 Scientific papers published in journals like Journal of Constructional Steel Research.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Imperfections for flat plate elements	- Development of an approach for combining local and global imperfections of thin-walled members in coupled instabilities. - Development of consistent structural plate buckling imperfections of thin-walled products according EN 1993-1-3 and plated structural elements according to EN 1993-1-5. - Harmonization of structural plate buckling imperfections EN 1993-1-5 and corresponding tolerances EN 1090-2	Is dependent on first results of SC3.T1 Is related to SC3.T3	EN 1993-1-3 is dealing with thin-walled products of typically 0.75 – 3,0mm in the area of sheeting, roofing and claddings. EN 1993-1-5 is dealing with slender flat plate products with thickness larger than 3mm and in plane loading. Both parts EN 1993-1-3 and EN 1993-1-5 are dealing with plate buckling issues. The development of consistent structural imperfections will harmonize the use of both parts in a significant manner.	New and modified rules in EN 1993-1-3 and EN 1993-1-5	✓
4	Improved interaction rules for plates	- Improvement of interaction rules for shear and bending for unstiffened/stiffened plates. - Improvement of interaction for biaxial bending and biaxial compression.	Is dependent on first results of SC3.T1	Incorporation of results of international recent studies, from RFCS projects in particular. A better use of natural resources through a more efficient use of material by improved design rules and lower costs of the structures in providing improved design rules.	New and modified rules in EN 1993-1-5	✓
5	Improved patch loading rules for plates	- Existing rules are incomplete. There is a demand to improve the existing patch loading rules including interaction for improved design of launching of bridges and of crane runway beams	Is dependent on first results of SC3.T10 and SC3.T5 will profit from	Incorporation of results of international recent studies, from RFCS projects in particular. A better use of natural resources through a more efficient use of material by improved design rules and lower costs of the structures in providing improved design rules.	New and modified rules in EN 1993-1-5	

6	Stiffener design	- Existing rules are incomplete and partially over-conservative. Improvement of rules for the design of stiffeners	None required in advance SC3.T10 is dependent on	Incorporation of results of international recent studies, from RFCS projects in particular.A better use of natural resources through a more efficient use of material by improved design rules and lower costs of the structures in providing improved design rules.	New and modified rules in EN 1993-1-5	✓
7	Harmonization of design rules for stiffened plated elements	- Harmonization between plate buckling rules for normal and thin walled components. - Harmonization of EN 1993-1-5 with EN 1993-1-7 especially when transverse loads are applied to stiffened plates e.g. deck plates.	None required in advance SC3.T5 is related on	This will ensure a consistency within the whole design process of stiffened flat plated elements as covered for different type of loading and plate thickness in the relevant parts of EN 1993, namely EN 1993-1-3, EN 1993-1-5 and EN 1993-1-7.	New and modified rules in EN 1993-1-3, EN 1993-1-5 and EN 1993-1-7	
8	Guidance for use of FEM in design	- Development of guidance for use of FEM in design - Consistency of rules given in EN 1993-1-5 and EN 1993-1-6 with respect to imperfections and FEM.	Is dependent on first results of SC3.T1 Is related to SC3.T5 SC3.T.10 and SC3.T5 will profit from	Complex structures are more frequently designed using the Finite Element Method (FEM). The development of design guidance for the use of FEM will thereby follow future design trends and will allow for a harmonized procedure FEM design that is important to guarantee a uniform safety level.	New and modified rules in EN 1993-1-5 Annex EN 1993-1-6	
9	Development of advanced design rules for extended girder applications	Girders with plated web elements are often used in different design configuration in order to allow an economical use of material and resources. For the following different type of girders additional and advanced design rules will be developed: - Girders with corrugated webs. This kind of girders are more and more used in daily design work because of their efficient load bearing behaviour. The existing design rules do not cover well all the specifics of this type of girders. - Girders with tapered webs. Existing design rules in EN 1993-1-5 are based on typical rectangular web. - Hybrid girders: With increasing use of high strength steel the need for efficient and correct rules for hybrid girders with flanges of high strength steels and webs of mild steels becomes relevant. - Girder with plates which are curved in elevation and in plan. There is a clear gap between member sections as used e.g. for bridges and the application of EN 1993-1-6 for shells. - Girders with web openings. Girders with web openings are increasingly used to account for installation requirements e.g. in buildings.	None required in advance Is related to SC3.T1, SC3.T5 and SC3.T8 SC3.T10 are dependent on	Incorporation of results of international recent studies, from RFCS projects in particular. A better use of natural resources through a more efficient use of material by improved design rules and lower costs of the structures in providing improved design rules.	New and modified rules in EN 1993-1-5	✓

Task Ref:	**SC3.T5**	**Task Name:**	Harmonisation and Extension of Rules for Shells and Similar Structures - Revised EN 1993-1-6 and EN 1993-1-7
Proposed Task Phase:	**P2**	**Deliverable:**	Revised EN 1993-1-6 Revised and restructured EN 1993-1-7 Background documents
Outline Task Scope:		Based on an evaluation of all available NAs, the task aims at reducing the number of NDPs and NCCI. Harmonization of the existing rules for tubulars and shells under global bending from EN 1993-1-6 across EN 1993-1-1, EN 1993-3-1, EN 1993-3-2, EN 1993-4-1, EN 1993-4-2 and EN 1993-5. Re-drafting of EN 1993-1-7 to address problems of assemblies of plate elements under transverse loads. Transformation of EN 1993-1-7 from a limited standard dealing only with plates with simple edge conditions under simple transverse loads into a standard on box assemblies of plates under potentially complex transverse loads with interactions between the plate elements and exploitation of the strength of edges and corners. Extension of the rules to address several aspects that are currently outside the scope of EN 1993-1-6, EN 1993-3-1, EN 1993-4-1 and EN 1993-4-2. Harmonization of rules by eliminating the current serious discontinuities and inconsistencies. Extension of rules for imperfections to be used in for modern computational modelling of complex shell structures. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1993-1-6 and EN 1993-1-7 and its available background documents. Scientific papers published in journals. ECCS P125 European Recommendations on Shell Buckling (2008). Documents of ECCS Technical Group TWG 8.4	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Cylindrical shells and tubular members under global bending	The current buckling rules of EN 1993-1-6 for shells and those of EN 1993-1-1 on tubular members are mismatched by roughly 50% for the critical range that is relevant to chimneys, wind turbine towers, masts, piles, thin tubes, pipelines, storage containers and similar structures. The mismatch is causing some problems for existing applications and inhibits innovation in others. The mismatch arises because shells buckle under local stress states, but tubes respond to global stress resultants, leading to different conceptual models being used historically and leading to mismatches where they meet. This project will resolve these discrepancies and give a harmonized strength description relevant to all tubulars and cylindrical shells under global bending.	Is dependent on first results of SC3.T1 SC3.T12 will profit from this	Each application (e.g. chimneys) has a history of producing its own rules to predict buckling strength. This leads to difficulties when an innovative structure is not in any of the categories, and the assessed strength appears to depend on how the structure is categorized. A wide range of different types of structure and industries will benefit from this project. It must include an assessment of realistic imperfections in each structural form, since imperfections play a huge role here.	Modified and revised section to enlarge the LBA-MNA method in EN 1993-1-6	
4	Shell buckling and boundary condition requirements	In all shell structures (aerospace vehicles, nuclear containments, storage containers, towers, chimneys and piles) the buckling strength assessment is based on assumed idealized boundary conditions for each shell segment. For each load case, the effect of the boundaries is different, but a small change can easily reduce the strength by 50%. However, the structural requirements of rings and junctions to realize these conditions in practice are nowhere defined in the standards, leading to uncertainty and overdesign by designers and insecurity for owners. This project will identify and quantify the stiffness requirements for rings and edge details for the many different buckling modes that can arise. Such a project has never been undertaken before.	SC3.T12 is dependent on its completion	All applications of thin shell structures, from tanks and silos to masts, wind turbine towers and chimneys will benefit from a scientific definition of the stiffness requirements at boundaries to produce the defined shell buckling strengths given by the simple assumptions of idealised boundary conditions.	Enhanced and clarified Section 2.3 in EN 1993-1-6	✓
5	Buckling of spherical and similar thin shells	Spherical domes provide extremely efficient roof structures for large diameter storages, but were omitted in EN 1993-1-6. The rules of ECCS P125 will be used as a starting point, but they are incomplete: they use an inconsistent approximate calculation process and do not mention the effect of an edge ring, so they must be modified for inclusion in EN 1993-1-6.	None requested in advance	All applications in which a thin dome roof provides an economic and efficient structural system.	New and revised Annex D.5 in EN 1993-1-6	

6	Imperfections and computational modeling of shells	It is well known that the buckling of shells is more sensitive to imperfections than any other structural form (over 80% of the potential strength being lost through relatively minor dents). EN 1993-1-6 reflects this intense concern, with severe imperfections imposed for all computational modelling. More recent research has shown that this issue matters far more for the simple symmetrical conditions that have been extensively studied, but is less important for realistic load cases that have not been experimentally explored. But these practical cases are the ones that need computational modelling. This project will systematically explore the reducing role of imperfections and the increasing role of changes in geometry under unsymmetrical loads. It will devise simpler rules for the assumptions to be made by computational modellers.	Is related to SC3.T4	All innovative designs in which the old empirical rules are being superseded by computational modelling to provide more economic and reliable designs.	Simplification and modification of Section 3.3, 8.4 and 8.7 in EN 1993-1-6	✓
7	Transformation of EN 1993-1-7 to deal with box-like assemblies of plates	The published EN 1993-1-7 only addresses the strength of an individual plate under very simple transverse loadings with trivialized edge conditions. Real containment box structures (especially tanks, silos, reactor vessels and lock gates) have more complex loading, they involve interactions between adjacent plates including both flexure and membrane actions, and they derive considerable strength from the joints and corners between elements. This standard needs a major overhaul to address realistic problems in plate assemblies with transverse loading and membrane stresses in orthogonal directions. The revised standard will be a companion document on flat plate assemblies to EN 1993 1-6 on curved plates forming shells, so similar provisions will be drafted.	SC3.T12 is dependent on its completion	Design provisions for this range of practical structures which are not addressed by any other standard. Coupling with computational modelling to permit much lighter designs than those currently produced using only beam theory.	EN 1993-1-7: Radical revision of the standard to extend it and simplify its provisions by replacing extensive tables with simple analytical expressions	✓

Task Ref:	**SC3.T6**	**Task Name:**	Fire design of Steel Structures - Revised EN 1993-1-2
Proposed Task Phase:	**P2**	**Deliverable:**	Revised EN 1993-1-2 Background documents according to the sub-tasks
Outline Task Scope:		Based on an evaluation of all available NAs, the task aims at reducing the number of NDP and NCCI. Harmonisation of stability rules between fire design according to EN 1993-1-2 and cold design according to EN 1993-1-1 General simplification of design rules. Improvement of design rules taking into account modern calculation methods, e.g. by providing additional material parameters. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical. Extension of design rules taking into account modern steel grades as e.g. high strength steel and stainless steel.	
Starting documents:		EN 1993-1-2 and its available background documents. Scientific papers published in journals. Literature and research documents produced by members of Research Committee ECCS-TC3 "Fire design" and recent results of RFCS-research.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Material properties for cooling phase of real fires	Generally needed to calculate steel structures in real fires, up to now no definition of cooling phase provided.	None required in advance	Extension of the scope of EN 1993-1-2	Additional and modified rules in EN 1993-1-2	✓
4	Aspects of stability verification	- Detailed information concerning structural and geometrical imperfections for advanced calculation methods. - Additional rules for the buckling length of unbraced frames. - Improved and thereby simplified solutions for the classification of cross-sections based on new results of ongoing research project - Improvement of existing buckling curves for LTB depending on type of loading, consistency with Part 1-1.	First results of SC3.T1 Is related to SC3.T4 and TCEN1990.T1	Specification of detailed rules, Incorporation of results of recent international studies	Additional and modified rules in EN 1993-1-2	✓
5	Joints	Improvement of Annex D, leads to a more realistic and more general design, introduction of improved design method for welded and bolted joints.	Is related to SC3.T2	Addition of detailed rules	Additional and modified rules in EN 1993-1-2, Annex D	✓
6	Cellular beams	Cellular beams are not addressed in the current Eurocode version, based on recent research work a specific calculation method will be introduced.	Is related to SC3.T1 and SC3.T4 and SC4.T1	Extension of the design rules in EN 1993-1-2	Additional and modified rules in EN 1993-1-2	
7	Stainless steel	The σ-ε-relationship of stainless steels differs significantly from carbon steel. Introduction of new regulations for the fire design of stainless steels. Harmonization with EN 1993-1-4.	Is related to SC3.T7	Extension of the design rules in EN 1993-1-2	Additional and modified rules in EN 1993-1-2	
8	High strength steel	Introduction of rules for fire design of EN 1993-1-12 into EN 1993-1-2.	Is related to SC3.T1 and SC3.T13	Extension of the design rules in EN 1993-1-2	Additional and modified rules in EN 1993-1-2	✓
9	Design rules for class 4 cross-sections	Improvement of design rules for class 4 cross sections based on recent research work.	Is related to SC3.T1 and SC3.T4	Extension of the design rules in EN 1993-1-2. Specification of detailed rules. More effective design method.	Additional and modified rules in EN 1993-1-2	
10	Temperature-dependent ductility of structural steel	Currently, fixed value $\varepsilon_{t,0}$=0.15 limiting strain for yield strain, leads to problems in numeric models, experimental results available identifying temperature-dependency of ductility.	None required in advance	Specification of detailed rules	Additional and modified rules in EN 1993-1-2	

Task Ref:	**SC3.T7**	**Task Name:**	Stainless Steels - Revised EN 1993-1-4
Proposed Task Phase:	**P3**	**Deliverable:**	Revised EN 1993-1-4 Background documents
Outline Task Scope:		Based on an evaluation of all available NAs, the task aims at reducing the number of NDPs and NCCI. Harmonization with existing product approvals and other parts of EN 1993 regarding stability and connections. Improvement of design rules in EN 1993-1-4 based on the large body of tests and numerical analysis carried out over the last 20 years. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical. The task aims to introduce more sustainable stainless steel grades.	
Starting documents:		EN 1993-1-4 and its available background documents and National Annexes. Existing product approvals. Scientific papers, literature and research documents	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Development of generic strength and composition classes for structural stainless steel	Investigation into organization of stainless steel grades into generic strength and/or composition classes (to simplify the process for introducing new and sustainable grades into the standard such as lean duplexes and ferritics)	None required in advance	New grades of stainless steel are continually being developed to meet changing needs. The inclusion of generic strength/composition classes in EN 1993-1-4 will enable new grades which meet certain requirements on their mechanical properties to be included without issuing a formal amendment to the standard.	New and modified clauses in EN 1993-1-4	✓
4	Specification of mechanical and material properties of stainless steels	Incorporation of recent research results with regard to the specification of the mechanical and material properties (at room temperature as well as for elevated temperature for fire design) and adjustment with existing product approvals.	None required in advance	Incorporation of recent results of RFCS projects and harmonization with existing practice of product approvals.	New and modified clauses in EN 1993-1-4	✓
5	Design of work hardened stainless steel	Advanced design issues for work hardened stainless steel. Including rules for welded joints of work hardened stainless steels and giving rules about how to take into account the beneficial effects of work hardening which occur during fabrication.	None required in advance	Incorporation of recent results of RFCS projects. Improved design rules will lead to a reduction in the costs of a structure.	New and modified clauses in EN 1993-1-4	
6	Applicability of EN 1993-1-3 to stainless steel	Investigations to extend the applicability of EN 1993-1-3 to stainless steels.	Is related to SC3.T3	Punishment of cold-formed section due to over-conservative design rules can be eliminated and the competitive position of European producer of cold-formed sections can be strengthened.	New and modified clauses in EN 1993-1-4	
7	Adjustment of buckling rules and rules for bolted connections to stainless steels	Adjustment of corresponding rules in EN 1993-1-1 (on buckling) and in EN 1993-1-8 (on bolted connections) in order to harmonize and simplify the design.	Is dependent on first results of SC3.T1 and SC3.T2	Incorporation of recent results of national research projects Improved design rules will lead to a reduction in the costs of a structure.	New and modified clauses in EN 1993-1-4	✓

Task Ref:	**SC3.T8**	**Task Name:**	Steel Fatigue - Revised EN 1993-1-9
Proposed Task Phase:	**P3**	**Deliverable:**	Revised EN 1993-1-9 Background documents
Outline Task Scope:		Revision of EN 1993-1-9 by: - Harmonisation with other EN standards as e.g. EN 1993-1-11, EN 1993-2, EN 1994-2, EN 1090-2 and EN ISO 5817 - Integration of new experimental results - Enlargement of fatigue analysis methods and rules to come along with modern design practice - Integration of new execution tendencies - If possible, reducing the number of NDPs and NCCI based on an evaluation of all available NAs. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1993-1-9 and its available background documents and National Annexes. Scientific papers published in journals. Existing research results, such as RFCS BriFaG final report. IIW Fatigue Recommendations. EN 1999-1-3, EN 1993-1-11. ECCS TC6 documents	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Partial safety factors for fatigue strength	Choice of partial safety factors for fatigue strength given in the standard is based on IIW Fatigue recommendations and not clearly connected with the Consequence Classes (CCs) given in EN 1990. Therefore, these factors need to be adjusted/(re)calibrated to proposed Consequence Classes in order to control the required safety level.	None required in advance Is related to TCEN1990.T1	A calibration of these factors will - make the standard safety level correspond to those given in EN 1990 - allow for a consequent application of EN 1090	Revised Table 3.1 in EN 1993-1-9	✓
4	Hot spot stress method in fatigue	Finite elements (FE) structural analysis is used more and more. To such an analysis, the tables given in EN 1993-1-9 specifying the fatigue strength in terms of nominal stresses are not suitable. Information in Annex B – are incomplete and lack of precision especially when applying for modern type of structures. A revision based on other standards (DNV, GL rules) and CIDECT guide will be realized.	None required in advance	Use of finite elements (FE) will be based on a common certified approach and in accordance with general rules in EN 1993-1-9	Modified and reworked Annex B of EN 1993-1-9	✓
5	Fatigue loads on orthotropic decks	The application of today's fatigue load models from EN 1991-2 to orthotropic decks results in a comparatively short fatigue life. There is an obvious need for adjustment of the existing fatigue load model so that it fits to the reality.	None required in advance Is related to SC3.T10	Harmonization of fatigue load model and fatigue verification will avoid unjustified oversizing or useless expenses for maintenance of these structures.	Modified clauses regarding the application of fatigue load model for orthotropic decks in EN 1993-1-9 Coordination and harmonisation of clauses with EN 1991-2	✓
6	Harmonization of fatigue rules with other parts of EN 1993	Fatigue issues are dealt within several parts of EN 1993. Harmonization and inclusion of rules from other parts in EN 1993-1-9 will allow to minimize incoherencies and misunderstandings, e.g.: - Fatigue strength of threaded structural details in EN 1993-1-11 which differs from that of similar details in EN 1993-1-9, - Effect of cracking of concrete deck in composite bridges in EN 1994-2 resulting in not realistic stress ranges, - Different approaches and information given in EN 1999-1-3 and EN 1993-1-9, - Additional rules given in application parts such as EN 1993-2 and belonging NAs	None required in advance Is related to SC3.T10, SC4.T1, SC9.T1 and SC9.T4	Harmonisation and coherence of the standards.	New and/or modified clauses in EN 1993-1-9 Modified fatigue detail classes in EN 1993-1-9 and/or EN 1993-1-11 New and modified clauses in EN 1993-1-9 and/or EN 1994-2 about cracked/uncracked sections Harmonised contents of EN 1993-1-9 and EN 1999-1-3	✓

7	Fatigue data analysis	Detail categories given in EN 1993-1-9 correspond generally to detail categories given in IIW fatigue recommendations. Nevertheless, there are two different types of statistical analysis of fatigue data used within the two documents, so that the shapes of the fatigue S-N curves are not the same so that the variable amplitude verification formats differ too. One single method to be used on the basis of EN 1990 will be defined in order to have an agreed approach for future evaluation of fatigue tests.	None required in advance Is related to TCEN1990.T1	Proposal of a fatigue data analysis method in line with EN 1990.	Establishment of a unified method for fatigue data analysis.	
8	Updating of detail categories (fatigue strength) tables	The detail categories (fatigue strength of structural details), given in Tables 8.1 to 8.10 in EN 1993-1-9, were obtained on the basis of older test results. In the meantime: - Many new tests have been carried out, - New details (e.g. bolted connections, beams with shot nails, etc.) have been developed. - Investigations on existing riveted structures have been realized Based on existing research results and recommendations the detail catalogues will be enhanced.	None required in advance Is related to SC3.T10, SC3.T11 and SC3.T13, WG2.1	Taking into account the updates in fatigue data, in production and in design will allow keeping pace with industrial application.	Enlargement and modifications of Tables 8.1 to 8.10 in EN 1993-1-9	
9	Execution classes	Execution requirements are already specified in Tables 8.1 to 8.10 of EN 1993-1-9. In spite of that, those requirements are generally difficult to compare to since recently existing execution classes. Modified specification of execution classes for welded structures subjected to fatigue (together with revision of ISO 5817) and of fitness-for-service criteria will be developed.	None required in advance	Harmonization of execution and design will be achieved by taking into account execution classes for welded structures subjected to fatigue for re-classification of structural details.	Enlargement and modifications of Tables 8.1 to 8.10 in EN 1993-1-9	✓
10	Multi-axial fatigue	There is a rule for multi-axial fatigue in the standard which differs from the rules given elsewhere (e.g. IIW, DNV). Recent research will allow a more consistent and harmonized approach for the combination of normal and shear stress ranges. New information on multi-axial fatigue rules will be brought into line with the corresponding sections in EN 1993-2 (steel bridges), EN 1993-6 (crane runways) and EN 1994-2 (composite bridges).	None required in advance Is related to SC3.T10, SC3.T13 and SC4	Improved multi-axial fatigue verification criteria.	Modified and new clauses in EN 1993-1-9	
11	Post-weld treatment	The benefit of post-weld treatment has been demonstrated in various research projects and industry applications, but agreed design rules are still missing. Based on national and IIW documents application rules will be given.	None required in advance Is related to WG2.T1	New design rules for consideration of post-weld treatment will allow strengthening of new and existing structures.	New clauses in EN 1993-1-9	

Task Ref:	**SC3.T9**	**Task Name:**	Material and Fracture - Revised EN 1993-1-10
Proposed Task Phase:	**P3**	**Deliverable:**	Revised EN 1993-1-10 Background documents
Outline Task Scope:		Based on an evaluation of all available NAs, the task aims at reducing the number of NDPs and NCCI. EN 1993-1-10 contains the basic rules for the choice of material that are essential for all parts of EN 1993 in view of the overall robustness of steel constructions. The rules in EN 1993-1-10 are enlarged, e.g. including cold-formed hollow sections and further detail situation that are often used in practice. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical. For simplification of EN 1993 rules originally given in EN 1993-1-12 for high strength steels will be integrated.	
Starting documents:		EN 1993-1-10 and its available background documents and National Annexes. Scientific papers published in journals. Documents by ECCS TC6, JRC-reports. PhD thesis Dr. Höhler, National rules such as revised DAStRi 009.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Development of rules for cold-formed members	Although EN 1993-1-10 gives rules how to consider cold-forming in the production for the choice of material these rules will be improved for the specific case of hot-rolled and cold-formed hollow sections with high degrees of cold-forming. Advanced rules will be developed for hot-rolled and cold-formed hollow section structures based on existing JRC report.	None required in advance	Hot- and cold-formed member are widely used in the steel construction sector. Punishment of cold-formed section due to over-conservative design rules for low temperature applications can be eliminated.	New and modified clauses in EN 1993-1-10	✓
4	Choice of material for complex joint design for buildings	In predominantly static loaded structures, e.g. buildings, the variety and geometry of joints is much greater compared to e.g. bridges which suffer from fatigue and require well detailed joints. The existing rules for the choice of material as given in EN 1993-1-10 are based on the fatigue detail catalogue of EN 1993-1-9 and do not cover complex geometries of joint as often used in building constructions, with predominately static loading based on recent research results and national rules.	None required in advance Is related to SC3.T2 and SC3.T8	Extensions of the method for the choice of material also for complex geometries in building constructions. Enlargement of rules to take account typical construction details used in buildings.	New and modified clauses in EN 1993-1-10	
5	Harmonization of design rules with EN 1993-1-9	Fatigue and brittle fracture are closely related to each other as failure is in most cases caused by crack like defects due to fatigue and/or execution. Adjustment with the design rules given in EN 1993-1-9 (Fatigue). Transition of brittle fracture in comparison to high-cycle and low-cycle fatigue fracture.	None required in advance Is related to SC3.T8	Improvement of brittle fracture design criteria deepening on the type of fatigue loading which is a governing factor. This item will ensure the robustness of steel structures through a proper choice of material.	New and modified clauses in EN 1993-1-10 and EN 1993-1-9	✓
6	Choice of material for high strength steel	As high strength steel do generally have lower ductility compared to mild steel grades, it is quite important to develop appropriate design criteria for such steel grades also in the lower temperature region. Therefore further investigations are intended in order to extend EN 1993-1-10 to new steel grades as covered in EN 1993-1-12.	None required in advanceIs Is related to SC3.T1, SC3.T2 and SC3.T13	Improved design rules for the choice of material when using high strength steel. Furthermore this will result in a better use of natural resources through more efficient and thereby sustainable use of material by improved design rules.	Modified table in EN 1993-1-10	
7	Choice of material in seismic regions	A crucial point that governs the proper use of material are shock wave effects, e.g. during earthquake loading. The application of EN 1993-1-10 therefore has to be fully harmonized with EN 1998 and if necessary, additional design rules have to be brought forward. Additionally the rules in EN 1993-1-10 have also to be verified for shock wave effects (e.g. blast) and low cycle fatigue.	None required in advance Is related to SC8.T1 and SC8.T2	Formulation of auxiliary guidance recommendations for seismic resistant structures, for structures subjected to possible shock wave and structures in the low cycle fatigue area.	New and modified clauses in EN 1993-1-10	✓
8	Welded high strength steel joints	Development of innovative design rules for the resistance of welds of sustainable high strength steels (HSS), taking into account e.g. mismatch effects.	None required in advance Is related to SC3.T2 and SC3.T13	Incorporation of recent results of RFCS projects and other relevant National, European and International projects.	New and modified clauses in EN 1993-1-10	
9	Harmonized rules for general steel products	Development of a set of rules about properties that should be declared for non standard steels including target values and there required testing methods in order to allow the use of the steels according to Eurocode 3.	None required in advance Is related to SC3.T1	This will allow a uniform approach for a the general and safe use of modern steel products in the European market.	Modified clauses in EN 1993-1-1	✓

Task Ref:	**SC3.T10**	**Task Name:**	Steel bridges and tension components- Revised EN 1993-2 and EN 1993-1-11
Proposed Task Phase:	**P4**	**Deliverable:**	Revised EN 1993-2 Revised EN 1993-1-11 Background documents
Outline Task Scope:		Revision of EN 1993-2 and EN 1993-1-11 by: - Reduction of the number of NDPs and NCCI based on an evaluation of all available NAs - Integration of new materials and improved design rules that allow designers to build modern and light weight structures - Better harmonization of design rules with others EC parts and execution norms - Following the revision of other EC parts (EC0, EC1 and EC3) to keep a full coherence within the steel bridge design rules - Integration of recent knowledge and international research studies - Strengthening of the issues of robustness through durable design of tension elements - Harmonisation of design rules especially with EN 1992-2 (concrete bridges) and EN 1994-2 (composite bridges) through the HG Bridges In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1993-2 and EN 1993-1-11 together with its available background documents and National Annexes. SED documents. JRC reports. Scientific papers and results of research projects e.g. RFCS.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Fatigue verification in steel bridge design	- Fatigue load models for road bridges EN1991-2 currently includes five fatigue load models for road bridges, but in practice only one can readily be used in bridge design (FLM3). There is the possibility for some simplification. - Re-calibration for the λ factors Based on recent measurements of traffic data, re-calibration of the λ factors is foreseen to come along with future trend of used in conjunction with fatigue load model 3 is merited. - Orthotropic decks The detailing rules in Annex C of EN 1993-2 should be revised to be in accordance with EN 1993-1-9 and EN 1090-2.	Is related to SC1.T9, SC2.T1, SC3.T8 and SC4.T1	Harmonisation and simplification of fatigue design issues for bridges. Provision of future traffic trends through advanced λ factors. Harmonisation of fatigue detailing and execution between EN 1993-2, EN 1993-1-9 and EN 1090. Integration of new research results.	Modified and new clauses in EN 1993-2 Revised Annex C of EN 1993-2	✓
4	Global stability aspects in bridge design	- Lateral torsional buckling (LTB) Lateral torsional buckling can significant affect the economy of designs, including the suitability of the buckling curves for plated steel members. It is foreseen to improve the current approaches and addresses omissions relevant to bridge design, particularly in transient design situations and for U-frame design. - Steel arch global stability Annex D in EN 1993-2 needs to be improved and harmonised with the general buckling rules given in EN 1993-1-1.	Is dependent on SC3.T1	Enlarged lateral torsional buckling rules for the special application in bridge design. Harmonization of buckling rules especially with regard to the general rules given in EN 1993-1-1. Simplification of Annex D of EN 1993-2	Modified and new clauses in EN 1993-2 Revised Annex D of EN 1993-2	✓
5	New materials	There is a strong trend in Europe to use high performance steels S690 (in relation with the possibilities of hybrid girders) and weathering steels in bridge design. In fact this allows economic and environmental friendly design with reduced maintenance costs. The question is raised to extend the scope of EN 1993-2 to such steels, eventually by adding some specific design rules.	Is dependent on SC3.T9 Is related to SC3.T13	Improved design rules allowing for an increased use of high performance steel material, e.g. high strength steel or weathering steels.	Enlargement of scope of EN 1993-2 by providing new clauses	

6	EN 1993-2, Annexes A and B	Annexes A (bearings) and B (expansion joints) should be removed from EN 1993-2 to be integrated in EN 1990 as these topics concerns not only the steel bridges. Furthermore they should be revised to be in accordance with EN 1337 and EOTA (refinement of design rules, removal of inconsistencies between standards).	Is related to TCEN1990.T2	Restructuring of EN 1993-2 by shifting Annex A and B for example to proper places in EN 1090. Harmonisation and revision of Annex A and B in accordance with EN 1337	Revised Annex A and Annex B Restructured EN 1993-2	
7	Categorisation of tension components	In EN 1993-1-11 chapter 1 “General” three different kinds of tension components are described: group A, B and C. This differentiation is not or only partly considered in the rest of the document. In order to improve the ease of use of EN 1993-1-11 a consequent categorization needs to be implemented especially in the chapters 3 “Material”, 6 “Ultimate limit state” and 7 “Serviceability limit state”.	Is related to SC3.T1	Provision of: - consistent terms and definitions - improved design rules.	Modified clauses and rules in EN 1993-1-11 chapters 1, 3, 6 and 7	✓
8	Fatigue verification of tension components	The chapters including fatigue aspects for tension elements EN 1993-1-11 (8) “Vibrations of Cables” and EN 1993-1-11 (9) “Fatigue” need to be combined. Furthermore the new chapter should be revised to be in accordance with EN 1993-1-9.	Is related to SC3.T8	Provision of a simplified and less voluminous normative	Reduction and unification of clauses in EN 1993-1-11	✓
9	Product requirements for tension components	Annex A of 1993-1-11 “Product requirements for tension components” needs to be revised to be in accordance with the revised main document.		Provision of consistent terms and definitions in accordance with the modifications related to sub-tasks SC3.T.6 and SC3.T.7	Modified clauses and rules in EN 1993-1-11 Annex A	

Task Ref:	**SC3.T11**	**Task Name:**	Consolidation and rationalisation of EN 1993-3
Proposed Task Phase:	**P4**	**Deliverable:**	Revised EN 1993-3-1 Revised EN 1993-3-2 Background documents
Outline Task Scope:			User friendly rules for these specialised structures. Based on an evaluation of all available NAs, the task aims at reducing the number of NDPs and NCCI. Development of a consistent set of Parts (EN 1993-3-1: towers and masts and EN 1993-3-2: chimneys) in the light of use of the Codes and their National Annexes. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical. Harmonisation with action effects in EN 1991-1-4. Harmonisation with execution rules in EN 1090.
Starting documents:			EN 1993-3-1 and EN 1993-3-2 together with its available background documents and National Annexes Draft EN 50341 and other Parts of EN 1993 Scientific papers published in journals

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Harmonisation of EN 1993-3-1 with other CEN and CENELEC standards	- Calibration and validation of member buckling rules with revised rules in EN 1993-1-1, EN 1993-3-1 and CENELEC rules (EN 50341) for angle sections and built up sections from angles. - Harmonisation of rules on guys for guyed masts with EN 1993-1-11. - Enhancement of rules for vortex shedding in conjunction with EN 1991-1-4. - Clarification of execution rules in conjunction with EN 1090-2. - Harmonisation of shell buckling rules with revised rules in EN 1993-1-6. Current rules are not completely appropriate for a great part of chimneys and give inconsistencies for cylindrical shells with D/t ratios appropriate for chimneys.	Is dependent on SC3.T1 Is dependent on SC1.T3 Is related to SC3.T1 Is dependent on SC3.T5	Harmonisation of these rules will lead to a more consistent treatment across all Eurocodes and CENELEC standards, leading to significant simplification and greater ease of use.	Revisions of EN 1993-3-1 and -2 to achieve compatibility with other standards	✓
4	Improved rules for flanged connections	The current rules in EN 1993-3-1 and -2 on flanged connections require revision. Robust rules for leg flanges to be developed. This will be undertaken in collaboration with Task SC3.T.5 on rules for boundary conditions on shell segments, where the same questions arise.	Is related with SC3.T2 and SC3.T5	Improved safety and reliability of flanged connections in chimneys, towers and masts.	New clauses in EN 1993-3	
5	Rationalisation of the response rules currently in Annex B to EN 1993-3-1	Wind actions and response of masts and towers is to be transferred to Annex of EN 1991-1-4 by EG, with assistance from experts in TC250/SC1	Is dependent on SC1.T3	Retention of response rules specifically developed for guyed masts and lattice towers, ensuring continued reliability and economy in design.	Provision of a new annex for response of towers and masts in EN1991-1-4, with appropriate cross references from the main text of EN1993-3-1.	✓
6	Set criteria for when simplified 'beam' rules can be used for chimneys	Based on Literature search and validation in conjunction with Task SC3.T.5 a set criteria for when simplified 'beam' rules can be used for chimneys will be developed	Is related with SC3.T5	Simplification of the design process where 'beam' rules can be used. Improved safety and reliability of designs where the 'beam' rules are not appropriate.	New clauses in EN1993-3-2	

Task Ref:	**SC3.T12**	**Task Name:**	Harmonisation and Extension of Rules for Storage Structures – Revised EN 1993-4-1 and EN 1993-4-2
Proposed Task Phase:	**P4**	**Deliverable:**	Revised EN 1993-4-1 Revised and redrafted EN 1993-4-2 Background documents
Outline Task Scope:		Modification of existing rules in EN 1993-4-1 to harmonise fully with EN 1993-1-6 and address key problems omitted when it was originally drafted. Redrafting of EN 1993-4-2 to harmonise it with EN 1993-1-6 and all other EN 1993 standards. Amendment of rules for buckling of silos and tanks under wind to reflect new understandings. Introduction of rules for column and discrete supports for silos, which present designers with considerable challenges but are missing in EN 1993-4-1. Introduction of much simpler rules for corrugated silos. Simple rules for the resistance evaluation of silos under eccentric discharge. Advanced rules for vertically stiffened isotropic walls with internal pressure. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1993-4-1 and EN 1993-4-2 together with its available background documents and National Annexes. Extensive published papers on all topics, Texts on silo and tank design, ECCS P125.	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Buckling strength of tanks and silos under wind	Many failures of empty tanks and silos occur under wind. The current rules cover only very squat and very slender geometries and omit a major middle part of the practical range of geometries. They are empirically based on very limited experimental data. This project will produce a comprehensive model for all geometries based on computational studies matched to the existing test data. It will include identification of and measurement methods for the relevant damaging imperfections, the effects of grouped structures, and stepped wall thicknesses. The project plugs a gap in current scientific knowledge of these critical industrial structures. It will greatly simplify the current procedure used for stepped walls.	Is related with SC3.T5	A huge range of industries that store either fluids or solids in large quantities will benefit from the assurance that losses of production and storage capacity will be prevented as climate change affects the complex wind loads to which these structures are subject. These industries include food processing, plastics, oil and gas, agriculture and chemical processing. The beneficiaries are not the manufacturers of storage containers but the users of them.	Modified, simplified and extended Annex D.1 and D.2 in EN 1993-1-6 and modified clauses in EN 1993-4-1 and EN 1993-4-2	
4	Practical rules for column supported silos	Many large silos are supported on columns to permit economic discharge of the contents, but EN 1993-4-1 has no rules for the design of a shell above discrete supports, or the placement of rings, or the sizing of rings, or the treatment of load combinations that produce unequal forces in columns (e.g. differential settlement, differential thermal expansion, overturning moments from wind and seismic action etc.). This project will adopt and synthesise several recent research studies and join them to devise appropriate design requirements for the complex problem of discrete forces on shell structures that are better suited to distributed pressures. This material is far outside the possible scope of EN 1993-1-6 on shells, but is of importance to a wide range of silo sizes.	Is related with SC3.T5	The beneficiaries will be a wide range of industrial users of silos. These structures are used in mining, mineral processing, rail heads and port facilities, agriculture, cement and steel production and many other industries. These structures are currently either excessively heavy or unsafe due to lack of design rules. Many different methods of supporting silo structures are currently in use because designers have no rules to permit them to assess either the structural response or the strength evaluation. This is a generic problem and not one that clearly identifiable industrial sponsors can be expected to fund.	New clauses in EN 1993-4-1	

5	Simplified rules for corrugated silos	Corrugated sheet silos are widely used in agriculture on farms and at rail heads. Many competing manufacturers all over Europe vie for supremacy in this marketplace, but the lack of regulation leads to many failures. The current buckling strength evaluation rules of EN 1993-4-1 are possibly the most complex of all in the Eurocodes. They need radical simplification to make them acceptable and comprehensive. This step is important to secure safety by regulating an unregulated market.	None required in advance	The beneficiaries will be a wide range of purchasers of grain storages, from food processing companies and grain merchants to individual farmers. All will have more secure knowledge of the safety and reliability of the products they are sold.	New clauses in EN 1993-4-1	✓
6	Vertically stiffened isotropic walls	A common construction form for metal silos is a thin isotropic shell wall with vertical stiffeners. The presence of internal pressure causes strange patterns of force transfer between these two elements, placing significant parts of the shell into vertical tension instead of compression. This aspect is not widely understood, and is not covered by EN 1993-4-1 or EN 1993-1-6. Further, the rules in ECCS P125 are misleading for this case. The impact of increased forces in stiffeners and reduced stresses in the shell must be included in both the stress evaluations and the resistance assessments in EN 1993-4-1.	None required in advance	The beneficiaries will be a wide range of industrial users of silos. These structures are used at rail heads and port facilities, agriculture, cement and steel production and many other industries.	New clauses in EN 1993-4-1	
7	Simple rules for assessment of resistance under eccentric discharge	The commonest cause of metal (and concrete) silo failures is eccentric flow of the solids inside the container during discharge. This often causes total collapse in service. It is difficult to prevent eccentric discharge of solids because it is caused by many short term conditions. The resulting pressure patterns lead to huge increases in local compressive stresses (e.g. 10×) that can only be predicted by FE analysis. A simple rule is needed to give elementary safe guidance to designers on measures to avoid these disasters. This is a challenging problem for both EN 1991 4 and EN 1993-4-1.	None required in advance	Owners of metal silos that store relatively coarse solids or solids that may segregate on deposition. Owners of metal silos who need to extract solids from non-central openings for functional and economic reasons. Experts involved in litigation on silo failures.	Modification of EN 1993-4-1	✓
8	Simplifying and harmonising the Tanks Eurocode with the Shells and other SC3 standards	The application standard EN 1993-4-2 on steel tanks has limited provisions and is incompatible with the generic EN 1993-1-6 and other EN 1993 standards. This project will re-structure the tanks standard and harmonise it with the others.	None required in advance Dependent on SC3.T5	When upgraded, EN 1993-4-2 should provide a modern standard covering a wide range of steel fluid containers for use by designers of all circular steel tanks.	Complete revision of EN 1993-4-2	✓

Task Ref:	**SC3.T13**	**Task Name:**	Evolution of existing parts of EN 1993 not included in the other tasks
Proposed Task Phase:	**P4**	**Deliverable:**	Revised EN 1993-1-12, EN 1993-4-3, EN 1993-5, EN 1993-6
Outline Task Scope:		Reduction of NDPs and enhancement of 'ease of use' in line with requirements of Mandate M/515 Dissolving of EN 1993-1-12 Harmonized applications parts of EN 1993	
Starting documents:		EN 1993-1-12, EN 1993-4-3, EN 1993-5, EN 1993-6	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.	Is related to SC3.T1,	Reduced national variation and improved ease of use of the Eurocodes.	Modified clauses.	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.		Improved ease of use of the Eurocodes for practical users.	Modified clauses.	✓
3	Dissolving of EN 1993-1-12	EN 1993-1-12 includes additional rules for the extension of EN 1993 up to steel grades S700. These additional rules will be allocated in various parts of EN 1993 and thereby EN 1993-1-12 will be dissolved. This will lead to an enormous simplification of the rules especially for high strength steel.	Is related to SC3.T1 – SC3.T12	Improved ease of use of particular for high strength steel within all parts of EN 1993.	New and modified clauses in all relevant parts of EN 1993.	✓
4	Harmonisation of the application parts of EN 1993	EN 1993 includes in total 8 single applications parts. In terms of a simplified used of all these application parts there is a strong demand to harmonize the content and overall structures of these parts in a common and uniform way.	Is related to SC3.T1 – SC3.T12	A harmonized set of application parts of EN 1993 in order to improve the ease of use.	New and modified clauses in all applications parts of EN 1993.	

Task Ref:	**SC4.T1**	**Task Name:**	Respond to demands from industry, including needs for harmonization with EN1992 and EN1993
Proposed Task Phase:	**P1**	**Deliverable:**	Revised EN1994-1-1, -1-2 and -2
Outline Task Scope:		The biggest need for evolution of the Eurocodes is to respond to industry comments on the current codes. This task will address the priority items. Also, during the evolution process changes will be made to EN1992 and EN1993. Some of these will impact EN1994 and require modifications to ensure the codes remain in harmony.	
Starting documents:		EN1992, EN1993 and EN1994 parts as appropriate	
Justification for inclusion in Phase 1:		All three existing parts of EN1994 contain some rules that could be further simplified, clarified, corrected or better harmonized with other Eurocodes.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Identification and analysis of paragraphs, clauses and formulae that require simplification, clarification, correction or harmonisation	Groups were formed during 2012 to consider the evolution of all three parts of EN1994. They have already begun to gather feedback from industry (through NSBs, workshops, known experts) to identify those clauses etc that need new consideration, and to identify solutions. It is very important that such comments made by industry are addressed.	Harmonisation relates to SC3 Task 1 (which is broad in scope but perhaps most relevant are T1.5 and T1.6). SC3 T10.3 may also result in changes that need to be reflected in EN1994-2. SC2 Task 1 is very broad but will certainly include items that affect EN1994.	Develop improved (clarified, simplified, corrected, harmonised) solutions to problems identified by industry	Revised design procedures	✓
4	Compilation of outcomes of sub-task 3 into codified rules	Once the needs for each part have been identified in sub-task 3 the resulting solutions need compiling and presenting in a suitable format	SC2 and SC3- as above	Implement improved (clarified, simplified, corrected, harmonised) solutions to problems identified by industry	Modified clauses in EN1994-1-1, -1-2 and -2	✓
5	Repeat sub-task 3 at the start of Phase 4 to pick up any consequences for harmonization of changes that have taken place to EN1992 or EN1993 during earlier phases.	As sub-task 3, but a revisit to ensure that any changes made to EN1992 and EN1993 during the evolution process do not adversely affect harmonisation with EN1994	SC2 and SC3 – as above	Developed solutions that remain harmonised with EN1992 and EN1993	Revised design procedures	✓
6	Compilation of outcomes of sub-task 5 into codified rules	As for sub-task 4	SC2 and SC3 – as above	Implement solutions that remain harmonised with EN1992 and EN1993	Modified clauses in EN1994-1-1, -1-2 and -2	✓

Task Ref:	**SC4.T2**	**Task Name:**	Composite beams with large web openings
Proposed Task Phase:	**P1**	**Deliverable:**	New part of EN1994, or revised EN1994-1-1and -1-2
Outline Task Scope:		Establish rules, based on principles contained in EN1994 and EN1993, for the design of beams with large web openings. This specific guidance for a type of beam will greatly ease the use of EN1994, rather than individuals having to compile rules from first principles – often with different results. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1994, existing industry guidance	
Justification for inclusion in Phase 1:		An ad-hoc working group has been active in developing rules since late 2011. A draft was seen by both SC3 and SC4 in early 2012. Agreed and acceptable rules will be available by early 2013. Composite beams with large web openings have been widely used in practice for well over ten years, and normalisation of design methods is needed.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Development of design procedures	Composite beams with large web openings are widely used across Europe. A number of proprietary solutions exist, based on differing test programmes and engineering methodologies. New generic design procedures are needed to ensure that all these solutions satisfy certain general principles, and to give designers of bespoke solutions simple and clear procedures to follow.	SC3 Task 1 is a general update that may affect EN1994. SC3 T1.6 specially mentions rules for beams with large web openings	Extend scope of EN1994 to cover current construction practice. Facilitate the uptake of good solutions through the provision of generic guidance.	Design procedures.	
2	Compilation of design procedures into codified rules	Present the results of sub-task 1 in the correct format.	SC3 – see above		Depending on how comprehensive the guidance is, it could appear either as a standalone Part, or as new clauses in EN1994-1-1 and EN1994-1-2	✓
3	Production of background documentation	Production of complementary information to facilitate correct use of new procedures.	SC3 – see above		Published document	

Task Ref:	**SC4.T3**	**Task Name:**	Revised rules for shear connection in the presence of modern forms of profiled sheeting
Proposed Task Phase:	**P1**	**Deliverable:**	Revised EN1994-1-1
Outline Task Scope:		Develop a revised push test that is shown to provide a more accurate prediction of shear stud resistance and ductility, and use this methodology to test slabs with modern forms of profiled sheeting to determine shear connector rules that are appropriate for modern products. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1994-1-1	
Justification for inclusion in Phase 1:		Industrial funding has already been secured for a large multi-partner project that will address several aspects of composite design. It will deliver guidance on a revised push test, (that better replicates the behaviour of a connector in a beam) and modified rules appropriate for modern shapes of trapezoidal sheeting by 2014 at the latest (that is the project end date).	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Development of a revised push test	Work undertaken in Australia some years ago raised concerns about the validity of the shear connection resistance (and ductility) rules given in EN1994. Recent work undertaken in the UK, and work undertaken in the US, has shown that these concerns are mainly unfounded, but a new, simple and standardised test is needed to better predict shear connector behaviour.	-	The currently specified push out test does not accurately predict the ductility of shear connectors – it was developed as a cost effective way of predicting resistance. A more accurate test is needed to facilitate safe innovation.	Revised clauses in EN1994-1-1	
2	Development of design procedures for shear connectors used with modern forms of profiled sheeting	The rules in EN1994 concerning the impact of sheeting shape on shear connection resistance and ductility are based on test results from the late seventies through to the early nineties. New products have appeared on the market in recent years that have the main aim of reducing the volume and weight of concrete to maximise slab efficiency. The effect these products have on shear connection behaviour needs thorough examination.	-	Ensure the scope of EN1994 covers current construction products and the rules in EN1994 (which are semi-empirical) safely reflect these products.		
3	Compilation of procedures into codified rules	Present the results of sub-task 2 in the correct format	-			✓
4	Production of background documentation	Production of complementary information to facilitate correct use of new procedures.	-			

Task Ref:	**SC4.T4**	**Task Name:**	Develop new rules for composite columns (concrete filled tubes) in fire.
Proposed Task Phase:	**P1**	**Deliverable:**	Revised EN1994-1-2 Annex H
Outline Task Scope:		Based on tests and numerical information develop new rules that will be widely accepted by the member states. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1994-1-2 plus the various national alternatives that have been proposed in National Annexes.	
Justification for inclusion in Phase 1:		An ad-hoc working group has been active in developing guidance since late 2011. There is some urgency as the current rules (informative Annex H in EN1994-1-2) have been rejected by the vast majority of member states.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Development of design procedures to better predict the load bearing resistance of concrete filled tubes in fire	Concrete filled steel tubes are an attractive solution where loads are high and space is at a premium. Because the current (informative) rules have been widely rejected by member states, new design procedures are needed to ensure safe and more widespread adoption of such solutions.	-	The current (informative) EN1994-1-2 Annex H has not been accepted for use in the vast majority of member states. Thus alternative and acceptable rules are needed to provide sufficient scope for this reasonably common form of construction, which offers numerous benefits.	Revised Annex H in EN1994-1-2	
2	Compilation of procedures into codified rules	Present the results of sub-task 1 in the correct format	-			✓
3	Production of background documentation	Production of complementary information to facilitate correct use of new procedures	-			

Task Ref:	**SC4.T5**	**Task Name:**	Development of rules covering shallow floor construction, and other flooring types using precast concrete elements.
Proposed Task Phase:	**P2**	**Deliverable:**	A new part of EN1994, or revised EN1994-1-1 and -1-2
Outline Task Scope:		Establish rules, based on principles contained in EN1994 and EN1993, for the design of shallow floors and other beams using precast units. This specific guidance will greatly ease the use of EN1994, rather than individuals having to compile rules from first principles – often with different results. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1994-1-1 and EN1994-1-2	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Development of design solutions for shallow floor construction	Although shallow floor solutions have seen widespread adoption across Europe for over ten years, they nevertheless postdate the development of current EN1994 content and so are a glaring omission from the current scope. Designers would welcome generic guidance to complement the current proprietary guidance that is available for numerous systems.	SC3 makes no mention of shallow floors but there will be some interdepency with SC3 Task 1. SC2 Taks 1 is very broad but there may be some interdependency	Extend scope of EN1994 to cover current construction practice. Facilitate the uptake of good solutions through the provision of generic guidance.	Depending on how comprehensive the guidance is, it could appear either as a standalone Part, or as new clauses in EN1994-1-1 and EN1994-1-2	
2	Development of design solutions for composite beams incorporating precast concrete units	Precast concrete units are often used compositely with steel beams, but (although industry best practice guidance has been available for some time) are not currently covered by the scope of EN1994. Guidance is needed in particular to clarify how to detail the shear connection to ensure safe force transfer.	SC3 and SC2 – see above	Extend scope of EN1994 to cover current construction practice – precast units represent a significant proportion of the flooring market used with composite beams.		
3	Compilation of solutions into codified rules	Present the results of sub-tasks 1 and 2 in the correct format. Note this is dependent on industry funding being provided for the earlier sub-tasks	SC3 and SC2 – see above	As above.		✓
4	Production of background documentation	Production of complementary information to facilitate correct use of new procedures. Note this is dependent on industry funding being provided for the earlier sub-tasks	SC3 and SC2 – see above	As above.		

Task Ref:	**SC4.T6**	**Task Name:**	Extended scope of shear connector and materials guidance to cover current industrial needs.
Proposed Task Phase:	**P3**	**Deliverable:**	Revised EN1994-1-1 and -2
Outline Task Scope:		Extend scope of shear connector guidance to cover current industrial needs. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1994-1-1 and -2	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies (Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Consideration of the load-slip behaviour of new types of shear connector, and development of appropriate design procedures	The current scope of EN1994 is limited to welded headed shear studs. As the market continues to innovate to find more effective solutions it is important that codified guidance is available to assure safety, without stifling innovation.	-	Extend scope of EN1994 to cover current construction practice. Facilitate the uptake of good solutions through the provision of generic guidance.	Modified clauses in EN1994-1-1 and possibly EN994-2	✓
2	Identification of resistance of shear connectors in various conditions, and development of appropriate design procedures	Combined axial and shear loading of a shear connector may adversely affect its resistance, in ways that are not recognised by the current rules in EN1994. The same is true for connectors that are subject to fatigue damage.	SC3 Task 8.10	Ensure that the rules given in EN1994 can safely cover all likely scenarios.	Modified clauses in EN1994-1-1	✓
3	Development of design rules for high strength materials used in composite construction	High strength steels and concrete are commonly used in modern construction but not adequately covered by the current scope of EN1994. Their safe adoption should be encouraged, as higher strength can result in lower environmental impact through clever design. Rules are needed to allow safe innovation, and ensure that EN1994 does not lag too far behind current practice. Coordination with SC2 and SC3 will be essential.	-	Extend scope of EN1994 to cover current construction practice.	Modified clauses in EN1994-1-1 and possibly EN1994-1-2 and EN1994-2	✓
4	Compilation of design procedures into codified rules	Present the results of sub-tasks 1, 2 and 3 in the correct format.	-	As above	Modified clauses in EN1994-1-1 and possibly EN1994-1-2 and EN1994-2	✓
5	Production of background documentation	Production of complementary information to facilitate correct use of new procedures. Note this is dependent on industry funding being provided for the earlier sub-tasks	-	As above		

Task Ref:	**SC4.T7**	**Task Name:**	Development of rules for composite frames and prestressed elements
Proposed Task Phase:	**P3**	**Deliverable:**	Revised EN1994-1-1 and -1-2
Outline Task Scope:		Extend scope of EN1994 so that composite elements are not just treated in isolation, but guidance is also given on how to combine them into a fully composite frame. Prestressed elements will also be covered by this task. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1994-1-1 and -2. EN1993-1-8	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies (Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Consideration of the behavior of composite frames and development of appropriate design procedures	The current scope of EN1994 needs extending to cover a broader range of frame types, in particular sway frames that adopt composite construction for the beams, columns and joints, to maximise the efficiency of this form of construction.	-	Guidance on more sophisticated frame types is needed to ensure safe uptake of more material efficient solutions, the complexities of which are often misunderstood by practicing designers.	New clauses in EN1994-1-1 and -1-2	
2	Consideration of the behavior of prestressed elements used in composite construction, and development of design procedures	Prestressed elements are commonly used in composite construction but not currently covered by EN1994.	-	Extend scope of EN1994 to cover current construction practice.		
3	Compilation of procedures into codified rules	Present the results of sub-tasks 1 and 2 in the correct format. Note this is dependent on industry funding being provided for the earlier sub-tasks	-	As above.		✓
4	Production of background documentation	Production of complementary information to facilitate correct use of new procedures. Note this is dependent on industry funding being provided for the earlier sub-tasks	-	As above.		

Task Ref:	**SC5.T1**	**Task Name:**	New items in revised Eurocode 5, part 1-1
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and Technical background documents; new clauses for Cross Laminated Timber (CLT) and Reinforcement of timber structures resulting in a revised EN 1995-1-1.
Outline Task Scope:		Harmonisation, not only within Europe. Code developments in USA and ISO will be considered and, if accepted, incorporated. Efficient material usage, due to the fact that "low quality wood" can be turned into a high quality product by the CLT manufacturing process. Reinforcement possibilities ensure structures a longer (economical) live. Both results have positive effects on climate change. Warranted safety. Incorporation of existing national rules which have been reliably applied for many years, taking into account recent results of international studies. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN1995-1-1, prEN 16531 'Timber structures – Cross laminated timber – Requirements', existing national rules, recent results of international studies	
Justification for inclusion in Phase 1:		SC5.T1.1: Cross Laminated Timber (CLT) is turning into one of the most important timber products during the last few years; therefore it is necessary to implement this product and the way of construction within the European regulations. SC5.T1.2: Reinforcements of timber structures are widely applied in Civil Engineering: therefore it is extremely important to produce a document which takes into account the existing national rules, which have been reliably applied for many years, and the recent results of international studies.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Cross Laminated Timber	Due to increasing use of cross laminated timber (CLT), it is necessary to cover the product and its use in construction within European rules. Therefore, the four areas of 'product', 'testing', 'design & construction' and 'application' have to be covered. The work program of CEN/TC250 concentrates especially on 'design & construction'. The 'product' CLT has already been covered in the product standard prEN 16531 'Timber structures - Cross laminated timber - Requirements'. A coordination in this work area with TC124 is seen as essential. The structure of the work program is oriented on EN 1995-1-1.	CEN/TC124 SC5.T5 (connections) SC5.T4 (fire)	Harmonisation. Not only within Europe. Code developments in USA and ISO will be discussed and, if agreed on, incorporated.	New clauses	✓
2	Reinforcement of timber structures	Reinforcements of timber structures are widely applied to avoid brittle failures and to increase bearing capacity in case of compression perpendicular to the grain.	SC5.T5	Harmonisation. Warranted safety. Incorporation of existing national rules which have been reliably applied for many years, taking into account recent results of international studies.	New clauses	✓

Task Ref:	**SC5.T2**	**Task Name:**	New Eurocode 5 Part on Timber Concrete Composites
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and technical background documents resulting in a new Eurocode part for Timber Concrete Composites.
Outline Task Scope:		Simplification of the part 1 where a number of clauses are given for this type of structures. Coordination with other related Eurocodes namely Eurocode 2 (and, up to less extend, Eurocode 4). In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Recent results of international studies; scientific background from e.g. CIB W18 conferences (in which recent results of international studies are discussed).	
Justification for inclusion in Phase 1:		Timber Concrete Composites are widely used for the floor structures without harmonized design rules.	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Incorporation of recent results of international studies. Transformation into scientific and technical background documents	Timber structures are developing to Medium Rise applications (up to 10 storeys) in which TCC is widely used for the floor structures.	SC2 SC4	Harmonisation. Simplification of the part 1 where a number of clauses are given for this type of structure.	CEN TS; New Eurocode part	✓

Task Ref:	**SC5.T3**	**Task Name:**	Revised Eurocode 5, part 1-1
Proposed Task Phase:	**P2**	**Deliverable:**	Scientific and Technical background documents. New or modified clauses resulting in a revised part En 1995-1-1
Outline Task Scope:		Harmonisation, reduced number of NDP's, effective material usage (positive effect on climate change) and safety. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1995-1-1; EN 1995-2; National Annexes, including NCCI herein; scientific background from e.g. CIB W18 (in which recent results of international studies are discussed).	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Design rules with non-continuous (ie –stepped) output	Replace these design rules by continuous output. (1) Stability of members (2) Compression perpendicular Lateral torsional buckling of (slender) beams is an important issue in light weight structures (like timber structures). The rules must be unambiguous. This applies, of course, for all design rules. However, these non-continuous results apply also to compression to the grain which affects the design of almost every structure.	-	"Robust" design rules	Modified clauses	✓
4	Holes in beams	Structures have to accommodate installation work for which often holes in beams (and columns) are necessary. So far, no corresponding design rules are given in Eurocode 5. These are necessary due to potential brittle failure of such elements in tension perpendicular to the grain.	SC5.T1 (reinforcement) SC5.T5 (connections)	Harmonisation. Warranted safety. Incorporation of existing national rules which have been reliably applied for many years, taking into account recent results of international studies.	New clauses	✓
5	Design rules for foundation piles	In certain areas of Europe (and outside Europe as well) wooden foundation piles are more or less extensively used. For example, in the Netherlands and Flanders the market for wooden foundation piles is approximately 150.000 annually. Design rules are missing in Eurocode 5 and Eurocode 7.	SC7	Harmonisation	New clauses	✓
6	Racking resistance of walls	Reduction of NDP's. In the present Eurocode 5 two design methods are described which are subjected to a national choice. Only one method is more desirable.	SC8	Harmonisation	Modified clauses	✓
7	Vibrations caused by pedestrians and Floor vibrations	In the present Eurocode 5, part 2, a simplified method for simply supported beams or truss systems is given in an informative annex with a reference to future versions of EN 1991-2. More adequate design rules, reflecting the state of the art, are needed in Eurocode 5. Reduction of NDP's. Furthermore, the design rules in the present Eurocode 5 are only meant for residential buildings with rectangular floors. Design rules for other applications and lay outs are missing.	-	Harmonisation	New and modified clauses	✓

Task Ref:	**SC5.T4**	**Task Name:**	Revised Eurocode 5, part 1-2 (Fire)
Proposed Task Phase:	**P3**	**Deliverable:**	Scientific and Technical background documents. New or modified clauses resulting in a revised EN 1995-1-2
Outline Task Scope:		Harmonisation, reduced number of NDP's, simplification, effective material usage (positive effect on climate change) and safety. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1995-1-2; National Annexes, including NCCI herein; scientific background from CIB E18 and SIF conferences (in which recent results of international studies are discussed).	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Connections in fire	Incorporation of recent results of international studies	SC5.T5	Harmonisation	New and modified clauses	✓
4	Fire resistance of assemblies with partly filled cavities	The cavities of most of the assemblies used are partly filled with a (fire resistant) insulation material. These assemblies are not dealt with in Eurocode 5.	-	Harmonisation	New clauses	✓
5	Design procedures for mechanical resistance	EN 1995-1-2 gives two simplified calculation models (Reduced cross-section method and Reduced properties method) for the design of timber members in fire. The field of application of the Reduced cross-section method should be extended (e.g. timber I-joists, CLT, Timber-concrete composite elements, etc.) while the Reduced properties method should be deleted.	-	Simplification and harmonisation	New and modified clauses	✓
6	Fire resistance of assemblies with fully filled cavities	The calculation model given in Annex C (informative) based on the Reduced properties method should be deleted, replaced with a calculation model based on the Reduced cross-section method and implemented in the main part of EN 1995-1-2.	-	Simplification and harmonisation	New and modified clauses	✓
7	Fire design rules for CLT and timber-concrete composite (TCC) structures	Incorporation of recent results of international studies. Timber structures are developing to Medium Rise applications (up to 10 storeys) in which CLT and TCC are widely used.	SC5.T2	Harmonisation	New clauses	✓
8	Analysis of the separating function of wall and floor assemblies	The calculation model given in Annex E (informative) is based on input data that were deduced from a limited number of fire tests of wall assemblies, and covers therefore only a limited area of timber structures. A more general calculation model should be implemented in the main part of EN 1995-1-2.	-	Harmonisation	New and modified clauses	✓
9	Design procedures for fire protective claddings	Failure time of gypsum plasterboards type F are missing. Simplified equations should be given as alternative to testing according EN 13381-7 that is under revision and will provide values to be used in EN 1995-1-2. (Structural) fire design is an important issue in many cases. Timber is a combustible material and is therefore sometimes protected by incombustible sheet material. These sheet materials are often used for fire protective reasons in timber frame assemblies. Design rules for determining the performance of these protective materials are given in EN 1995-1-2. However, many of these materials are not treated in EN 1995-1-2.	-	Simplification and harmonisation	New and modified clauses	✓

Task Ref:	**SC5.T5**	**Task Name:**	Revised Eurocode 5, part 1-1
Proposed Task Phase:	**P3**	**Deliverable:**	Scientific and Technical background documents. New or modified clauses resulting in a revised Part EN 1995-1-1.
Outline Task Scope:		Harmonisation, reduced number of NDP's, simplification, effective material usage (positive effect on climate change) and safety.	
Starting documents:		EN 1995-1-1; National Annexes, including NCCI herein; scientific background from e.g. CIB W18 conferences (in which recent results of international studies are discussed).	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Glued in rods	Glued in rods are widely used all over the world. Consequently, design rules are esperately needed in Eurocode 5.	-	Harmonisation	New clauses	✓
4	Design rules with non-continuous (ie –stepped) output	Replace these design rules by continuous output	-	Robust design rules	Modified clauses	✓
5	Shear plug and block shear	Although brittle failure modes like shear plug and block shear occur in large connections with dowel type fasteners, these failure modes are not addressed properly in Eurocode 5.	-	Turning informative Annex A into a normative annex: harmonisation	Modified clauses	✓
6	Design rules for modern carpentry connections	Due to computer aided design and manufacturing developments, traditional carpentry connections are back into the market. However, the shape of these newly manufactured connections differ from the traditional ones. Eurocode 5 should reflect these developments.	-	Harmonisation	New clauses	✓
7	Connection geometry (spacing, end-, edge distances, etc.)	Present requirements are traditionally based primarily on the diameter and therefore do not take into account that the load-carrying capacity today might be much higher than a traditional fastener with the same diameter. In all cases the design strength is (much) higher than the design stress (load). However, the geometrical design rules in EN 1995-1-1 are incorrectly independent of the difference between the design strength and design stress. Based on recent research results the geometrical design rules should be relaxed.	-	More realistic (and efficient) design	Modified clauses	✓
8	Lateral load-carrying capacity, EYM	The original model is checked for dowels of steel with low yield strength. There is therefore a need to update the model so that it works properly with today's fasteners and connectors. There is also a need to improve the rules for multiple shear planes.	-	More realistic (and efficient) design	Modified clauses	✓

Task Ref:	**SC5.T6**	**Task Name:**	Evolution of existing parts of EN 1995 not included in the other tasks
Proposed Task Phase:	**P4**	**Deliverable:**	Revised EN 1995-2
Outline Task Scope:		Reduction of NDPs and enhancement of 'ease of use' in line with requirements of Mandate M/515	
Starting documents:		EN 1995-2	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.		Reduced national variation and improved ease of use of the Eurocodes.	Modified clauses.	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.		Improved ease of use of the Eurocodes for practical users.	Modified clauses.	✓

Task Ref:	**SC6.T1**	**Task Name:**	Revised version of EN 1996-1-1
Proposed Task Phase:	**P1**	**Deliverable:**	Approaches for harmonisation and improvement of ease of use; new and revised clauses for EN 1996-1-1 dealing with materials
Outline Task Scope:		Reduction of NDPs, simplification and shortening with the aim to: improve ease of use, harmonisation between different parts and also with general rules of structural design given in EN 1990; increase of the reliability of material data calculated acc. to the code; guarantee of effectiveness in the competition with other materials, consideration of new materials following the energy saving requirements (big cavities, lower density, lower strength). In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1996-1-1, ESEMASE reports, CIB W23 reports, experimental data	
Justification for inclusion in Phase 1:		Part -1-1 forms the basis for all other parts and also interacts with EN 1998-1-1. It is essential that the work for part -1-1 starts immediately to enable subsequent tasks to be completed in time.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research. In particular, a large effort has to be made for simplifying the calculation of the compressive strength based on the so called normalized strength of masonry units. Points for harmonisation between different parts of EC 6 will be identified. Ease of use should be checked considering the feedback from the review starting in 2013.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Masonry Material Properties	Masonry as composite can be made of a large variety of units and mortars. Experimental data that has become available in the last 5 years can give a more reliable determination of the masonry compressive strength by calculation based on the properties of the materials (units and mortar) used, especially by simplification of grouping of units. There are no specific rules to calculate the compressive strength of natural stone masonry based on the unit strength. Recent research in France provides a basis to enhance the rules for natural stone. Out-of-plane strength of reinforced hollow block masonry is now far too conservative because the gross compressive strength of the blocks is used. Allowance for the use of the net compressive strength of the block should be included.	The task has to be done in close cooperation with TC125/WG1, where material testing and shape factors play an important role (a separate Task Group is already initiated within TC125/WG1).	Simplified and less conservative rules.	New and revised clauses	✓
4	Structural Analysis - general	There are similarities between the behavior of unreinforced and reinforced concrete with respectively unreinforced and reinforced masonry. Where possible rules can be harmonized. Especially rules to calculate the second order effect, shear and braced walls may be beneficial for masonry.	-	Harmonisation of rules. Easiness of use for a large group of structural engineers now mainly active in the field of concrete.	New and revised clauses	✓
5	Structural Analysis - complex shapes	In masonry it is very easy to have complex wall shapes but hardly possible to verify them. Those structures can contribute to the stability of masonry structures. In general, those types of structures have increased resistance with less material.	-	New rules for complex shapes enhancing the structural possibilities of masonry.	New and revised clauses	✓
6	Confined masonry	Extend and improve the rules for the design of confined masonry for seismic purposes.	EN 1998	Improved rules in design.	New and revised clauses	✓

7	Limit State Design	A lot of research work has been done on shear.(e.g ESECMaSE). The Code should be brought up to date. However avoiding increased complexity, fitting simplified rules with the same theoretical bas should also be developed. The enhancement of strength under concentrated loads is disputed. Reseacrh is underway and will be considered. For the application of simplified rules for masonry structures in EN 1998, additional rules in EN 1996 may be needed. Also enhancement of rules for reinforced and confined masonry will contribute to seismic design of masonry. Currently the model for checking the vertical resistance is not fit for combinations of low module of elasticity and higher compressive strength. The model must be enhanced. A model is available in DK to develop a load reduction factor due to partial instability for combined vertical and out-of-plane loading which should be included in the code.	SC6.T4	Simplified and enhanced rules in design, especially with regard to the current unclarity when using rules for mainly vertically loaded walls or walls under combined loading	New and revised clauses	✓
8	EN 1996-1-1 Annex C	The provisions dealing with floors supported over a part of the thickness of the wall and spans need a review because of new knowledge, results of research and experiences of the practice.		Revised rules according to the most up-to-date experiences enhancing the use of current rules.	New and revised clauses	✓
9	Robustness	In response to revision of robustness rules in EN 1990 and EN 1991-1-7, specific masonry related rules have to be worked out, probably related to consequence classes.	Rules given from EN1990 and WG6	Harmonisation of rules.	New clauses	✓
10	Sustainability	The increasing complexity of masonry structures, especially due to increasing demands on energy efficiency, asks for extension of rules due to e.g. floors only partly supported by walls due to included insulation, and inclusion of "strange" materials to avoid cold bridges., wider cavity walls with increasing difference in stiffness of dematerialised outer leaves and more traditional inner leaves resulting in new and modified clauses in sections 3, 5 an 6.	-	Revised rules for more sustainable and efficient structures.	New and revised clauses	✓

Task Ref:	**SC6.T2**	**Task Name:**	Revised version of EN 1996-1-2
Proposed Task Phase:	**P3**	**Deliverable:**	Reduced range of tabulated values in Annex B / reduction of NDP's
Outline Task Scope:		Updating of the tabled values, reduction of NDP, simplification and shortening, check of reliability of the outcome, consideration of new products.	
Starting documents:		EN 1996-1-1, ESEMASE reports, experimental data.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Design by table values	Currently tables are filled based on national experience. Development of a harmonised method to establish the tabled values could reduce the number of NDPs and give a clear method to evaluate new test data.	SC6.T1	Provision of a clear method to evaluate new test data.	Revised clauses	
4	Calculation models for fire resistance.	The current annex C and D (Fire design by calculation) are not considered to be reliable. A review of recent research may lead to improvements.		Improvements of calculation models for fire resistance.	Revised clauses	

Task Ref:	**SC6.T3**	**Task Name:**	Revised version of EN 1996-2
Proposed Task Phase:	**P4**	**Deliverable:**	New and revised clauses for EN 1996-2
Outline Task Scope:		Updating of the content with the current state of the art, harmonisation between countries.	
Starting documents:		EN 1996-1-1 + evolution work , EN 1996-3	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	General review and updating	Since the finalising the current EC 6 an enormous development with a lot of innovations has happened and it is the time to check if new provisions for execution are needed and the current ones should be reviewed. Harmonisation with part 1-1, 2 and 3.	SC6.T1 SC6.T2 SC6.T4	Implication of innovations on design and executions will be clear and thus stimulating the application of those innovations	New and revised clauses	✓

Task Ref:	**SC6.T4**	**Task Name:**	Revised version of EN 1996-3
Proposed Task Phase:	**P2**	**Deliverable:**	New and revised clauses for EN 1996-3
Outline Task Scope:		Reduction of NDP's. Incorporation of fundamental changes in EN 1996-1-1 that forms the basis of EN 1996-3, inclusion of new rules to cope with new structural challenges due to increased thermal performance of masonry buildings (wider cavities, more complex floor wall connections, partly supported floor slabs, inclusion of "non masonry materials" within a wall) , extension of set of simplified rules	
Starting documents:		EN 1996-1-1 + evolution work , EN 1996-3	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research. In particular, a large effort has to be made for simplifying the calculation of the compressive strength based on the so called normalized strength of masonry units. The reduction of NDP's realized for part -1-1 should be taken over on a 1:1: basis	**SC6.T1**			✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Robustness	In response to revision of robustness rules in EN 1990 and EN 1991-1-7, specific masonry related rules have to be worked out, probably related to consequence classes. Although this subject will be primarily dealt with in part -1-1, a simplified approach may be added to this part.	SC6.T3	Simplified approach to robustness.	New clauses	✓
4	Ultimate limit state	Fitting simplified rules with the same theoretical basis as will be made available in part -1-1 (e.g. confined and reinforced masonry, combined loading), should be developed, especially considering currently used innovative products.	SC6.T1	Simplified rules with respect to the evolution of part -1-1 making the application easy for common structures.	New and revised clauses	✓
5	Provisions for simplified verification of supports of slabs which follow the energy saving standards. (floor slabs supported over part of the thickness of a wall)	Until now no verification formulae exist to verify this structural detail which is widely used at solid walls in countries with higher requirements for energy saving.	SC6.T1	Simplified verifications for supports of slabs.	New clauses	✓

Task Ref:	**SC7.T1**	**Task Name:**	Harmonization and ease-of-use
Proposed Task Phase:	**P1**	**Deliverable:**	Reorganized framework for Eurocode 7, to be used as starting documents for Tasks 2-5 below.
Outline Task Scope:		Simplify the basis of geotechnical design, reduce the number of Nationally Determined Parameters (NDPs), and remove textbook material in order to improve the overall readability and accessibility of the Eurocodes to the end-user Reorganize the Parts of Eurocode 7 to improve ease-of-use and provide space for new material. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Existing Eurocode 7 Parts 1 and 2.	
Justification for inclusion in Phase 1:		Along with ENs 1990 and 1991, Eurocode 7 (EN 1997) is a core part of the Eurocode system – since all structures are located on or embedded in the ground. Eurocode 7 is unique amongst the 'resistance' Eurocodes (i.e. ENs 1992 to 1999), in that it gives principles and application rules not just for man-made materials, but for a very wide range of natural geomaterials – including hard to weak rocks; gravels, sands, silts; hard to soft clays; peats; granular and cohesive fills; and others. Add the complication of dealing with the presence of ground water, hydrostatic and non-static, and it is easy to see why existing foundation design practice across Europe varies so widely. The introduction of Eurocode 7 has not yet harmonized this practice. Geotechnical design has traditionally been conducted using allowable stress concepts; the move to limit state principles embodied in the Eurocodes has brought geotechnics into line with mainstream structural practice – but not without difficulties. To accommodate different views of how to apply limit state principles and partial factors in design, Eurocode 7 introduced three Design Approaches which countries can choose from. In addition, many countries have selected different values for Nationally Determined Parameters in their National Annexes, to accommodate their existing national practice. Evolution of Eurocode 7 would allow simplification and reduction of these differences between countries. Eurocode 7 in its current form provides a framework for geotechnical design practice across Europe. Detailed design rules for many commonly built foundations are not yet included, although they are requested by practising engineers. Evolution of Eurocode 7 would allow this detail to be added. Implementation of Eurocode 7 over the few years it has been available has already uncovered areas where designs could be made more economic. Evolution of Eurocode 7 would allow conservatism to be removed. Eurocode 7 in its current form does not cover all aspects of ground engineering. Rock mechanics, tunnelling, ground improvement, and reinforced soil structures are important topics for which little guidance is given in the standard. Evolution of Eurocode 7 would allow these topics to be addressed. Surveys of practising engineers have shown that Eurocode 7 is considered to be more complicated than previous national standards. Evolution of Eurocode 7 would allow simplification of principles and application rules without loss of information.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research. In particular this work would make use of the background research being undertaken by TC250/SC7's Evolution Group 8 for 'Harmonization'.		Increased harmonization Simplification Improved efficiency and transparency in design	Modifications to the text and annexes of EN 1997-1	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode. Remove material readily available in text books and other NCCI documents. Remove repetition of principles and application rules across EN 1997. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 2 'Maintenance and Ease of Use' and must be done in close coordination with Evolution Group 8 for 'Harmonization'.		Simplification Greater user-friendliness	Modifications to the text and annexes of EN 1997-1	✓
3	Simplification of Design Approaches	Review the contents of all countries' National Annexes and supporting documents, where they provide essential details needed to implement Eurocode 7. Study the choices different countries have made with regard to which of the three Design Approaches (DAs) to adopt for different types of foundation analysis. Eliminate unnecessary choice from Eurocode 7 where that choice has not been taken up by the countries. Simplify the DAs by merging similar approaches and eliminating 'special cases' wherever possible. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 8 for 'Harmonization'. Each country has chosen to adopt one or more of the three available Design Approaches in Eurocode 7, but this choice varies with the type of geotechnical structure and leads to a confusing array of options for engineers attempting to work in more than one country.		Increased harmonization Simplification Greater user-friendliness Improved efficiency and transparency in design Better alignment with ENs 1992-6	Modifications to the text and annexes of EN 1997-1	✓

4	Reorganization of Eurocode 7 into 3 Parts	Reorganize Eurocode 7 (existing Parts 1 and 2) into three Parts: Part 1 - General Rules (and restructure); Part 2 – Ground investigation (structure largely unchanged); Part 3 - Geotechnical Constructions (new standard), to provide space for new material; greater harmonization with ENs 1992-6; and better alignment with national supporting documents published in many European countries. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 0 'Management and oversight'. Eurocode 7 Part 1 does not follow the same structure of the other Eurocodes, leading to difficulty in use by structural engineers. Space needs to be provided for new material proposed for inclusion in Eurocode 7. Many national supporting documents follow the new structure that is proposed for Eurocode 7, thereby assisting implementation in Member Countries.		Better alignment with ENs 1992-6	Modifications to the text and annexes of EN 1997-1 New standard EN 1997-3	✓
5	Improvements to list of references and literature	Improve user friendliness by including a bibliography of well known background documents, textbooks, related standards (e.g. ISO/TC 182, CEN/TC 341, CEN/TC 288) and recent studies.		Greater user-friendliness	Changes to the Annexes of EN 1997-1 Changes to the Annexes of EN 1997-2	

Task Ref:	**SC7.T2**	**Task Name:**	General rules
Proposed Task Phase:	**P1**	**Deliverable:**	Revised Eurocode 7 Part 1
Outline Task Scope:		Improve the consistency of geotechnical design in different countries, by consolidating common national practices and existing research. Harmonize different national practices and provide guidance for revised National Annexes. Improve the integration with EN 1990 'Basis of Design' and include much needed rules to improve the general reliability of Geotechnical structures. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Reorganized Eurocode 7 Part 1 (from Task 1) plus new/revised paragraphs from Tasks 3 and 6.	
Justification for inclusion in Phase 1:		Along with ENs 1990 and 1991, Eurocode 7 (EN 1997) is a core part of the Eurocode system – since all structures are located on or embedded in the ground. Rules for reliability discrimination, ground water pressures, numerical models and a general improved alignment with EN 1990 affect each geotechnical structure.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.		Increased harmonization Simplification Improved efficiency and transparency in design	Modifications to the text and annexes of EN 1997-2	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.		Simplification Greater user-friendliness	Modifications to the text and annexes of EN 1997-2	✓
3	Reliability discrimination	Review the methods used in different countries National Annexes to provide variable levels of reliability depending on consequences of failure and design situation (persistent/transient, etc). Select the best-of-breed solution and incorporate it into the Eurocode. This work would build on the background research being undertaken by TC250/SC7's Evolution Group 8 for 'Harmonization'. The head code EN 1990 allows reliability discrimination based on the geotechnical complexity and the consequence of failure. However, the methods of implementing such discrimination are not suitable for certain foundation types (such as slopes) even though they are needed for economic design.	SC7.T1	Increased harmonization Improved economy in design	Additions to the text of EN 1997-1 Section 2 and Annex A	✓
4	Ground water pressures	Review methods of factoring water pressures in different ways. Identify the most robust methods and provide guidance on how to apply them in different design situations. Use existing research undertaken by ISSMGE (International Society of Soil Mechanics and Geotechnical Engineering) European Technical Committee 10 where relevant. This work would build on the background research being undertaken by TC250/SC7's Evolution Group 9 for 'Water Pressures'. Considerable uncertainty exists regarding how to apply partial factors or safety margins to obtain design ground water pressures. The outcomes vary widely depending on the design situation and this leads to considerable design uncertainty in the finished structure.	SC7.T1	Rules for applying partial factors in design situations involving groundwater Reduced conservatism in design Increased reliability of designs involving groundwater	New sub-section within EN 1997-1	✓
5	Numerical models	Establish clear rules for using advanced numerical methods in day-to-day practice for inclusion in EN 1997-1. Such rules have been regularly sought during stakeholder feedback. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 4 for 'Numerical Methods'. Numerical models are becoming increasingly important in day-to-day geotechnical design practice, but their use has not been properly standardized.	SC7.T1	Rules for applying numerical methods in routine practice using Eurocodes Increased reliability of geotechnical designs based on numerical analysis to Eurocode 7	New sub-section within EN 1997-1	✓
6	Alignment with EN 1990	Transfer basis of design information to EN 1990 and ensure full consistency between EN 1990 and EN 1997. NOTE: needs to be undertaken in conjunction with EN 1990 Expert Group. Inconsistencies between EN 1990 and EN 1997-1 can lead to unreliable designs.	SC7.T1	Alignment with EN 1990	Changes to EN 1997-1 Section 2 and Annexes A and B	✓

7	Practical design examples	Perform numerical (mainly finite element) analyses of simple generic geotechnical structures and case studies to demonstrate the pros and cons of different partial factoring methods. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 4 for 'Numerical Methods'.		Provision of best-practice guidance	Scientific and Technical Report	

Task Ref:	**SC7.T3**	**Task Name:**	Ground investigation
Proposed Task Phase:	**P2**	**Deliverable:**	Revised Eurocode 7 Part 2 plus new/revised paragraphs as input to Task 2.
Outline Task Scope:		Provide practical guidance for selecting characteristic values of soil and rock parameters. Provide suggested values based on soil and rock description, to be used in the absence of reliable test data. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Reorganized Eurocode 7 Part 2 (from Task 1) plus new/revised paragraphs from Task 6.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.		Increased harmonization Simplification Improved efficiency and transparency in design	Modifications to the text and annexes of EN 1997-2	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode. Restructure EN 1997-2 with respect to ground investigations: with the provisions for planning, execution and evaluation of derived geotechnical parameters in EN 1997-2 and the evaluation of characteristic geotechnical parameters based on the derived values in EN 1997-1.		Simplification Greater user-friendliness	Modifications to the text and annexes of EN 1997-2	✓
3	Selection of characteristic soil and rock parameters from test data	Review recent research into this subject and develop better principles and practical rules for the selection of characteristic values in day to day practice. Principles to be based on same reliability theory that underpins the Eurocodes, but to take into account the massive variability of soils and rock parameters. Characteristic values of geotechnical parameter are the most important input in the geotechnical verifications of limit states. So a harmonised selection of these values is the basis of a harmonised geotechnical design. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 11 for 'Characterisation'. Selection of appropriate values for soil and rock parameters is the most important activity undertaken by a geotechnical engineer. In the end, these values make or break the availability of certain design choices. However, the great variability of the materials covered and the limited data available makes this task extremely difficult in day to day practice.		Rules for on selecting appropriate characteristic values for a wide range of design situations Increased reliability of design Less variability in outcomes for same design situation	Additions to the text of EN 1997-1 Section 3	✓
4	Suggested values of characteristic soil and rock parameters	Provide suggested values of commonly-used soil and rock parameters based on soil and rock description. Much of this information is published in existing National Annexes and other NCCI documents. Harmonize the values given there to allow greater consistency in design. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 8 for 'Harmonization'. Selection of appropriate values for soil and rock parameters is the most important activity undertaken by a geotechnical engineer. Provision of suggested values makes this task more economic in in day to day practice.		Suggested characteristic values for common geotechnical parameters Greater economy of design for simple foundations Less variability in outcomes for same design situation	New Annex in EN 1997-1	✓
5	Alignment with ISO/TC 182/SC 1, CEN/TC 341 and CEN/TC 288 investigation and execution standards	Review existing rules provided in new (separate) ISO/CEN standards on execution and investigation; remove duplication contained within Eurocode 7 by cross-referring outwards. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 2 for 'Maintenance and ease-of-use'. Duplication (and contradiction) of design rules across different standards leads to confusion and errors. Simplification will bring greater clarity and improve the reliability of designs.		Clarity and simplification in the rules that apply to geotechnical design	Revised text in EN 1997-2	✓

6	Site investigation techniques for seismic and dynamic design	Provide details of common site investigation techniques used to establish characteristic values of parameters used in seismic and dynamic foundation design. Consider more explicitly the requirements of seismic geotechnical design with regards to site investigation in earthquake-affected regions; supplement the guidance given in EN 1997 Part 2 This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 6 for 'Seismic design'. Proper rules for conducting site investigation to support seismic and dynamic foundation design are lacking or inadequate.		Rules for site investigation for sesimic and dynamic foundation design	Additional text in EN 1997-2 Additional annexes in EN 1997-2	✓
7	Additional site investigation techniques for rock	Provide details of additional site investigation techniques used to establish characteristic values of rock. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 13 for 'Rock mechanics' Rules for conducting site investigation in rock are currently limited to only basic tests.		Additional rules for site investigation of rock	Additional text in EN 1997-2 Additional annexes in EN 1997-2	✓
8	Practical examples	Provide practical examples on how to obtain the characteristics of soil and rock for the end-user, for inclusion in a separate Scientific and Technical Report.		Provision of best-practice guidance	Scientific and Technical Report	

Task Ref:	**SC7.T4**	**Task Name:**	Foundations, slopes, and ground improvement
Proposed Task Phase:	**P2**	**Deliverable:**	Sections 2-5 and new Annexes in (new) Eurocode 7 Part 3.
Outline Task Scope:		Include widely-used calculation models for geotechnical design based on existing national practice and recent research. Add calculation models for widely used foundations types and techniques, thereby reducing barriers to trade. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		New Eurocode 7 Part 3 (from Task 1) plus new/revised paragraphs from Task 6.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Spread foundations	Add (normative and informative) models for shallow foundations that have been demonstrated to yield good designs. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 10 for 'Calculation models'. Formal surveys of practising engineers have revealed demand for widely-accepted calculation models for spread foundations to be added to Eurocode 7. Engineers need guidance on the best models available for different design situations, without having to resort to non-normative (typically national, not international) documents.	SC7.T1	Increased harmonization of design practice across Europe Improved use of Eurocode 7 in day-to-day design practice Reduced conservatism in design	Section 2 of new standard EN 1997-3 New annexes in EN 1997-3	✓
2	Pile foundations	Document the most commonly used calculation methods and formulas to determine pile resistance or behaviour for inclusion in (informative) annexes of EN 1997-1. Provide recommended values of any model factors that are needed to ensure consistent levels of reliability. Add to the standard new or more precise rules for common aspects of pile design, such as negative skin friction, lateral loads, pile groups, buckling, dynamic and cyclic loading, etc. These additional rules have to be elaborated. For seismic design of pile foundations a strong relation to EC 8 is planned. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 7 for 'Pile Design'. Formal surveys of practising engineers have revealed demand for widely-accepted calculation models for pile foundations to be added to Eurocode 7. Engineers need guidance on the best models available for different design situations, without having to resort to non-normative (typically national, not international) documents.	SC7.T1	Increased harmonization of design practice across Europe Improved use of Eurocode 7 in day-to-day design practice Reduced conservatism in design	Section 3 of new standard EN 1997-3 New annexes in EN 1997-3	✓
3	Cuttings and embankments	Add (normative and informative) models for cuttings and embankments that have been demonstrated to yield good designs. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 10 for 'Calculation models'. Formal surveys of practising engineers have revealed demand for widely-accepted calculation models to be added to Eurocode 7. Engineers need guidance on the best models available for cuttings and embankments for different design situations, without having to resort to non-normative (typically national, not international) documents.	SC7.T1	Increased harmonization of design practice across Europe Improved use of Eurocode 7 in day-to-day design practice Reduced conservatism in design	Section 4 of new standard EN 1997-3 New annexes in EN 1997-3	✓
4	Ground improvement	Review existing ground improvement techniques and their design to find common principles and rules features for inclusion on Eurocode 7. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 14 for 'Ground improvement'. Techniques for improving in situ ground by deep compaction, soil mixing, and stone or concrete columns are widely used but not covered by the existing version of Eurocode 7. These techniques can offer considerable savings in the total costs of construction.	SC7.T1	Provision of rules for design of ground improvement techniques Improved economy in design	Additions to the text of EN 1997-1 Section 5 of new standard EN 1997-3	✓
5	Harmonization of NDPs for pile design	Review the contents of all countries' National Annexes plus available JRC data; collate values for NDPs where they differ from recommended values. Consult with different countries to understand rationale behind NDPs where they are significantly different from recommended values. Perform calculations to demonstrate significance of these variations in NDPs. Reduce the number of NDPs to an acceptable minimum. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 8 for 'Harmonization' and would be performed in conjunction with task SC7.A Pile design varies significantly across Europe and could be made more consistent and economical by the establishment of common rules.	SC7.T1	Increased harmonization of design practice across Europe	New annexes in EN 1997-3	✓

6	Alignment with ENs 1992-6 (structural design of foundations)	Review existing rules given in ENs 1992, 1993, 1995 and 1996 regarding structural design of concrete, steel, timber and masonry foundations. Propose improvements to ensure better alignment with EN 1997 and to reduce unintended conservatism. Foundation construction can be made more economic by establishing better rules for structural design of foundations	SC7.T1 Tasks belonging to SC2, SC3, SC4, SC5, SC6	Alignment with ENs 1992, 1993, 1995 and 1996 Reduced conservatism in design	Changes to ENs 1992, 1993, 1995 and 1996	✓
7	Practical design examples	Provide example calculations to Eurocode 7 for common foundation types. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 3 for 'Model solutions'.		Provision of best-practice guidance	Scientific and Technical Report	

Task Ref:	**SC7.T5**	**Task Name:**	Retaining structures, anchors, and reinforced ground
Proposed Task Phase:	**P2**	**Deliverable:**	Sections 6-8 and new Annexes in (new) Eurocode 7 Part 3.
Outline Task Scope:		Add precise guidance for common aspects of design of retaining structures; include widely-used calculation models for retaining structures based on existing national practice and recent research. Harmonize partial and correlation factors used by different countries, to reducing barriers to trade. Provide practical examples of best practice to Eurocode 7. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		New Eurocode 7 Part 3 (from Task 1) plus new/revised paragraphs from Task 6.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Retaining structures	Add (normative and informative) models for retaining structures that have been demonstrated to yield good designs. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 10 for 'Calculation models'. Formal surveys of practising engineers have revealed demand for widely-accepted calculation models for retaining structures to be added to Eurocode 7. Engineers need guidance on the best models available for different design situations, without having to resort to non-normative (typically national, not international) documents.	SC7.T1	Increased harmonization of design practice across Europe Improved use of Eurocode 7 in day-to-day design practice Reduced conservatism in design	Section 6in new standard EN 1997-3New annexes in EN 1997-3	✓
2	Anchors	Extend coverage of anchor design to other than grouted anchors, e.g. to deadman anchors. Add (normative and informative) models for anchors that have been demonstrated to yield good designs. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 1 for 'Anchors'. Formal surveys of practising engineers have revealed demand for widely-accepted calculation models to be added to Eurocode 7. Engineers need guidance on the best models available for different design situations for anchors, without having to resort to non-normative (typically national, not international) documents.	SC7.T1	Increased harmonization of design practice across Europe Improved use of Eurocode 7 in day-to-day design practice Reduced conservatism in design	Section 7in new standard EN 1997-3New annexes in EN 1997-3	✓
3	Reinforced soil structures	Review existing methods of reinforced soil structure design in different countries. Find common features and align them with the Eurocode's limit state-plus-partial factor approach, for inclusion in a new section in EN 1997-3. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 5 for 'Reinforced soil'. Reinforced slopes offer the possibility of considerable environmental and cost savings during construction, and yet their design is not covered to an adequate degree in the existing version of Eurocode 7. Many countries have been forced to preserve existing non-limit-state national standards, which differ widely in their approach. This leads to inconsistency and confusion in design of mixed structures incorporating reinforced slopes (e.g. highway slopes and abutments), owing to the need to work with more than one design code and (often) philosophy.	SC7.T1	Provision of rules for reinforced slope design Harmonization of practice across Europe Improved clarity of design	New Section 8in new standard EN 1997-3 New annex on reinforced slope design	✓
4	Alignment with ENs 1992-6 (for structural design)	Review existing rules given in ENs 1992, 1993, 1995 and 1996 regarding structural design of concrete, steel, timber and masonry retaining walls. Propose improvements to ensure better alignment with EN 1997 and to reduce unintended conservatism. Retaining wall construction can be made more economic by establishing better rules for structural design of foundations.	SC7.T1 Tasks belonging to SC2, SC3, SC4, SC5, SC6	Alignment with ENs 1992, 1993, 1995 and 1996 Reduced conservatism in design	Changes to ENs 1992, 1993, 1995 and 1996	✓
5	Practical design examples	Provide example calculations to Eurocode 7 for common retaining wall types. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 3 for 'Model solutions'.		Provision of best-practice guidance	Scientific and Technical Report	

Task Ref:	**SC7.T6**	**Task Name:**	Rock mechanics and dynamic design
Proposed Task Phase:	**P3**	**Deliverable:**	New/revised paragraphs into Tasks 2-5.
Outline Task Scope:		Improve consistency of design rules for foundations between EN 1997-1 and EN 1998-5, leading to a more user friendly experience of the code. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Existing Eurocode 7 Parts 1 and 2.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Rock mechanics	Provide principles and rules for the design of all forms of foundations in rock. Review ways of adapting existing methods of design for rock mechanics to the limit state-plus-partial factor philosophy of the Eurocodes. Provide improved rules for application of and limitations of existing rules for rock mechanics given in EN 1997. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 13 for 'Rock mechanics'. Rules for the design of foundations in rock in the existing EN 1997 are inadequate.	SC7.T1	Improved rules for geotechnical design in rock	New text in ENs 1997-1, -2, and -3	✓
2	Foundations subject to dynamic loading	Provide principles and rules for the design of all forms of foundations subject to dynamic loading. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 6 for 'Seismic design'. There are few practical rules in the existing EN 1997 for the design of foundations subject to dynamic loading.	SC7.T1	Provision of rules for design of foundations subject to dynamic loading	New text in ENs 1997-1, -2, and -3	✓
3	Alignment with EN 1998-5 (seismic design of foundations)	Review current seismic geotechnical design practice to identify deficiencies in EN 1997 and EN 1998-5. In conjunction with SC8, resolve these deficiencies and decide where best to address them. This work would make use of the background research being undertaken by TC250/SC7's Evolution Group 6 for 'Seismic design'. Existing rules for the seismic design of foundations given in EN 1998-5 were developed largely in isolation from EN 1997-1. Greater compatibility between the codes is needed.	SC7.T1 SC8 Tasks	Simplification for the end user: Improved interoperability between Eurocodes 7 and 8 Reduced conservatism in design	Changes/additions to the text of EN 1997-1 and/or EN 1998-5	✓
4	Practical design examples	Provide practical examples on how to design foundations in rock and foundations subject to dynamic loading, for inclusion in a separate Scientific and Technical Report.		Provision of best-practice guidance	Scientific and Technical Report	

NOTE

1. SC7 has had detailed discussions on whether Eurocode 7 should be divided into two or three Parts, although a final decision has not yet been taken. This response has been developed on the basis that Eurocode 7 will be divided into three Parts, although the outputs could readily be recombined into two Parts. A final decision on the number of Parts will be taken by SC7 during execution of the mandate, on review of the outputs.

Task Ref:	**SC8.T1**	**Task Name:**	Material independent sections of EN 1998-1
Proposed Task Phase:	**P1**	**Deliverable:**	Redrafting of Section 3 (Ground conditions and Seismic action) of EN 1998-1. Complete redrafting of Annex B of EN 1998-1 to extend it to cover both the "demand" and the "supply" sides of the safety verifications in the context of Displacement Based design.
Outline Task Scope:		Revision and update of the Material Independent Sections of EN1998-1 (Sections 1 to 4 and 10). Extend the scope of EN 1998-1 to cover "construction" as a whole, encompassing structural, non structural and equipment parts.	
Starting documents:		EN 1998-1 and National Annexes. Information from the JRC database on the Nationally Determined Parameters. Final report of Research Project SHARE.	
Justification for inclusion in Phase 1:		Seismic zonation and the definition of the seismic action are key elements for all parts of EN 1998. Its updating fundamentally influences EN 1998 and so this activity should have priority with regard to other changes. Considering its much closer physical meaning, displacement based design lies in the future of codified seismic design. This shall entail a major change in the current force based approaches and accordingly a step by step evolution is advisable. In view of the wide implications of this change, the extension of Annex B of EN 1998-1, to make displacement based design usable in practice, should be developed in Phase 1.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	European Seismic Zonation and definition of the Seismic Action	In the present version of EN1998 the seismic zonation and the definition of the spectral shape of the seismic action for design are Nationally Determined Parameters (NDPs) to be defined in the National Annexes to EN 1998-1. Although n EN 1998-1 corresponded to an advancement in terms of harmonization (by establishing a "standard shape" of the design spectra and by establishing the anchoring variable for the definition of the national seismic zonation maps) it is clear that there is a need to pursue further such harmonization in the future revision of EN 1998. Seismic zonation and the definition of the seismic action are key elements for all parts of EN 1998. Its updating fundamentally influences EN 1998 and so this activity should have priority with regard to other changes.	-	The main benefit of this action is to update the way in which the seismic zonation is presented, taking profit of the more recent research in this field and aligning EN1998 with the way in which seismic zonation is presented other national and international seismic codes. To this effect profit shall be taken from recent European research projects, namely the project SHARE, which provided consistent methodologies and tools to support the establishment of a European seismic zonation.	Redrafting of Section 3 (Ground conditions and Seismic action) of EN 1998-1. The redrafting shall provide the advancement towards a harmonized seismic zonation but still enabling the Member States, if required, to establish its own safety levels at different performance levels and for different types of structures (importance classes).	✓
4	Displacement based design	'Displacement based' methods of seismic design are gaining increasing acceptance as an alternative to the 'force based' methods which form the current basis for most international seismic codes for new construction, including EN1998. Over the past 15 years, displacement based methods have been developed in many parts of the world, and a US code provides detailed procedures for using them to assess existing buildings. The current provisions ofEN1998-1 in principle allow new buildings to be designed by displacement based methods and Annex B gives already some advice on analytical procedures to be used to tackle the "demand side" of the problem. However this is not complete and information on the deformation capability of members ("supply side") is completely lacking in EN1998-1. Some of this information is currently provided in Annexes to EN1998-3 for existing buildings, but these data have not been fully validated. EN1998-2 currently gives more complete information for the displacement based design of new bridges, but again this needs development. Displacement based methods are widely considered to result in structures which provide seismic resistance more economically and reliably than force based methods, particularly with respect to limiting economic losses in an earthquake. Hence EN1998-1 needs to include fully implementable provisions for their use in building design if it is to remain an internationally leading seismic code. In view of the wide implications of this change, the extension of Annex B of EN 1998-1, to make displacement based design usable in practice, should be developed in Phase 1.	-	The main benefit of this action is to advance towards the codification of displacement based design for new structures. It is recognized that this corresponds to a major change in the way seismic design is approached and so a step by step evolution is envisaged. Hence, the reference force-based methods shall be kept but the current Annex related to the non linear static analysis shall be updated to make it fully usable in practical terms. For such update of Annex B of EN 1998-1, the relevant information on deformation capability of structural elements already included in EN 1998-3 for Assessment and Retrofitting of existing buildings shall be duly considered and incorporated.	The aim of the project is to develop and codify the displacement-based design method for new buildings. Annex B of EN 1998-1 shall be fully revised and extended to cover both the "demand" and the "supply" sides of the safety verifications. Profit shall be taken from the information available in EN 1998-3, namely, providing verification criteria for the yielding and ultimate deformation capacity of structural members and of the whole structure.	✓

5	Base isolation, additional damping and new technologies	The design of Buildings with base isolation is covered by Section 10 of EN 1998-1. However, this section "*does not cover passive energy dissipation systems that are not arranged on a single interface, but are distributed over several storeys or levels of the Structure"* and *"only full isolation is considered"*. Hence this action aims at the development of design rules to remove these restrictions in scope and to open the way for the design of buildings with the more recent technologies in passive control. This shall also be an opportunity to improve the interface between the design standard (EN 1998) and the relevant product standard (EN 15129) since in the current versions of the two standards a consistent interface has not been fully achieved.	This sub task shall require interaction with CEN/TC340 that is in charge of the development of product standards for antiseismic devices.	The main benefit is to eliminate the present restrictions of scope in Section 10 that is detrimental for the practical use of EN1998-1 in view of the recent advancements in the field of base isolation and distributed damping. Another key benefit shall be the improvement of the interface between the products standard and the structural design standard. At present, the technical specification of the antiseismic devices by the structural designer is not straightforward.	Redrafting of Section 10 (Base Isolation) of EN 1998-1. The redrafting shall widen the scope of this section to encompass partial isolation and distributed damping.	✓ (partial)

Task Ref:	**SC8.T2**	**Task Name:**	Material dependent sections of EN 1998-1
Proposed Task Phase:	**P2**	**Deliverable:**	- Updating of Section 5 (Specific Rules for Concrete Buildings) to extend the field of application of Ductility Class L and adjust the Ductility Classes M and H and to incorporate buildings with flat slab systems in its scope. - Updating of Sections 6 and 7 (Specific Rules for Steel Buildings and Composite Buildings) to incorporate the proposals from ECCS. - Thorough updating of Section 8 (Specific Rules for Timber Buildings) of EN 1998-1 to incorporate the more recent advances in seismic design of timber buildings. Extension of the building typologies and the wood-based materials covered by this Section. - Improvement of Section 9 (Specific Rules for Masonry buildings) of EN 1998-1 for better consistency with the Sections on other materials. Reduction of NDPs (as much as possible accounting for the large variability of masonry units and construction practices prevailing across Europe). - Inclusion of a new Section in EN 1998-1 for Aluminium buildings or extension of the provisions of Section 6 (Specific rules for Steel buildings) to encompass also Aluminium buildings. - Improvement of the modeling and seismic design verifications for infill panels and cladding panels with and without openings (including the evaluation of strength, stiffness and deformation capacity) and the requirements for the connections to the main structure.
Outline Task Scope:		Revision and update of the Material Dependent Sections of EN1998-1 (Sections 5 to 9). In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1998-1 and National Annexes. Information from the JRC database on the Nationally Determined Parameters. ECCS report "Assessment of EC8 Provisions for Seismic Design of Steel Structures"	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Concrete buildings: Ductility Classes and flat slab systems	At present, Section 5 of EN 1998-1 states that the use of "*ductility class L (low), is recommended only in low seismicity cases*". The "strength" of this recommendation is a bit ambiguous and it has been interpreted in some countries as a prohibition. This entails economic consequences and it is felt that, with some simple additional design rules to enhance the ductility of DCL structures it would be possible to extend its field of applicability to moderate seismicity situations, simplifying the design but still ensuring appropriate seismic reliability. Buildings with flat slabs are currently used in many European countries but EN 1998-1 in its Section 5 states that "*Concrete buildings with flat slab frames used as primary seismic elements in accordance with 4.2.2 are not fully covered by this section*". At present, in accordance with EN 1998-1, these buildings may only be designed for DCL (Ductility Class Low) or the slabs and the supporting columns may be considered as "secondary" seismic elements. Hence this action aims at the development of design rules for this type of structural systems, namely developing dimensioning and detailing rules for cyclic bending and punching.	-	The main benefit is to improve the rules for the design of structures of different Ductility Classes enabling the extension of applicability of simpler DCL design rules to moderate seismicity cases but still ensuring appropriate seismic reliability. An additional benefit shall be the elimination of the present situation regarding flat slab systems that is detrimental for the practical use of EN1998-1. The present situation corresponds to a void in the scope of Section 5 that creates ambiguity in its application to a widely used typology of reinforced concrete buildings.	Updating of Section 5 (Specific Rules for Concrete Buildings) revising the design rules for the three current Ductility Classes, in view of simplifying the design process throughout a wide seismicity range. Updating of this Section shall also incorporate new rules for buildings with flat slab systems, removing the present limitation in its scope. Inclusion of analysis, dimensioning and detailing rules for the design of column-slab connections.	✓
4	Steel buildings and composite steel-concrete buildings	The European Convention for Constructional Steel Works (ECCS) has prepared a document entitled "Assessment of EC8 Provisions for Seismic Design of Steel Structures" in which it lists a number of issues regarding Section 6 of EN 1998-1 that, in their view, require clarification or further development. ECCS has also expressed its availability to cooperate with CEN/TC250/SC8 in the activity leading to the revision of Section 6 and also Section 7 of EN 1998-1. The intention of this activity is to evaluate the proposals made by ECCS for such revision and whenever agreed by SC8, to improve and update this Section of EN 1998-1.	-	The main benefit is to bring Sections 6 and 7 up to date with the more recent advances in seismic design of steel buildings, discussing and incorporating the proposals of the leading European Association in the field of steel structures. Improvement of the consistency between the Steel and Composite sections of EN 1998-1 and EN 1993-1-1 and EN 1994-1-1 shall also be achieved	Updating of Section 6 (Specific Rules for Steel Buildings) and Section 7 (Specific Rules for Composite Steel-Concrete Buildings) to incorporate the proposals from ECCS.	✓ (partial)

5	Timber buildings	Section 8 of EN1998-1 on timber buildings suffered very little change in the conversion process from the ENV stage. Hence, its contents are outdated and needs updating.Aspects to be added or updated are:a) General re-evaluation of the building typologies and the values of the behaviour factors;b) Provisions for Capacity Design, including overstrength factors of ductile connections;c) Definition of interstorey drift limits for performance-based design;d) Provisions for wood-based materials such as cross-laminated panels (xlam) and oriented strand boards (OSB), and some fasteners;e) Inclusion of rules for the design of buildings with composite lateral load resisting systems (for instance timber wall panels with concrete cores or steel bracings;f) More detailed rules for the design of shear walls and horizontal diaphragms.	-	The main benefit is to bring Section 8 up to date with the state of the art for the seismic design of timber buildings, incorporating the results of recent research programs.This shall improve the conditions for the use and exploration of the intrinsic favourable characteristics of timber with regard to seismic actions. Improvement of the consistency between the Timber section of EN 1998-1 and EN 1995-1-1 shall also be achieved.	Thorough updating of Section 8 (Specific Rules for Timber Buildings) of EN 1998-1 to incorporate the more recent advances in seismic design of timber buildings.Extension of the building typologies and the wood-based materials covered by this Section. Revision of the values of the behavior factors.	✓(partial)
6	Masonry buildings	Masonry buildings represent a very large proportion of low rise construction in Europe but the provisions of EN 1998-1 did not achieve an in depth harmonization of design provisions as achieved for other materials. This is evident from the very large number of Nationally Determined Parameters (NDPs) provided for masonry buildings, including the values of the Behaviour Factor (to the contrary of the provisions to other materials). Furthermore there have been some claims that the present rules for “simple buildings” (mostly presented as NDPs) are disputable and inconsistent with post earthquake field surveys and consequently should be revised. Specifically, the project aims at the extension of the overstrength ratio concept to masonry (as foreseen for other materials, depending on the system redundancy), the improvement of the provisions for the prevention of out of plane collapse of masonry walls and the in depth revision of the rules for “simple buildings”.	-	The main benefit of this action is to update and improve the rules for the design of masonry buildings and to reduce the number of Nationally Determined Parameters of Section 9. Furthermore the provisions for “simple buildings” shall be improved.	Improvement of Section 9 (Specific Rules for Masonry buildings) of EN 1998-1 for better consistency with the Sections on other materials and reduction of NDPs (as much as possible accounting for the large variability of masonry units and construction practices prevailing across Europe).	✓(partial)
7	Infilled frames and claddings	Framed buildings with masonry infills are very common in southern Europe countries. Section 5 of EN 1998-1 already includes design provisions to account for the presence of infills but they are mainly devoted to avoid possible detrimental effects that the infills may cause to the main structure. To the contrary, the beneficial effects (namely being the source of overstrength and energy dissipation) are not yet accounted for. Improvement of the provisions of EN 1998-1 regarding infills could be sought but the implications of fully exploiting masonry infills in the design of new buildings should be carefully evaluated since it entails higher complexity of design and stricter quality assurance requirements for the construction of the infills. Additionally the recent earthquakes, namely in l’Aquila (Italy), have shown that in many recent buildings where the structure behaved properly, heavy damage in claddings and cladding panels occurred. This recommends that the design provisions of EN 1998-1 for infilled frames should be extended to cover cladding elements and panels, together with other types of enclosures.	This sub task has to be closely coordinated with sub tasks 3 and 6 (updating of Sections on concrete and masonry buildings).	The main benefit of this action is to improve the rules already presented in EN 1998-1 for infilled frames and also to extend them to claddings and cladding panels. This shall reduce the risk of out of plane collapse of these types of elements. Such collapse may be detrimental to the main structure since it introduces irregularities in its seismic response. Also, such collapses are life-threatening and may cause heavy economical losses.	The aim of the project is to re-visit this issue in EN 1998-1 and to re-evaluate fully the implications of the presence of infills for the seismic design of buildings. This should be done in conjunction with the revision of Section 9 for Masonry buildings, in view of some common aspects that exist between the two situations. Topics for possible inclusion in the project are the improvement of the modeling and seismic design verifications for infill panels and cladding panels with and without openings (including the evaluation of strength, stiffness and deformation capacity) and the requirements for the connections to the main structure.	✓
8	Aluminium structures	To the contrary of all other structural materials covered by the Eurocodes, EN 1998-1 does not include information regarding Aluminium structures.This creates a “void” that some countries have “solved” in their National Annexes but it should be addressed and eliminated altogether in EN 1998-1.	-	The benefit of this action is to eliminate the current absence of seismic design rules for Aluminium structures. The action shall be developed in liaison with CEN/TC250/SC9 to ensure consistency with the provisions of EN 1999.	Inclusion of a new Section in EN 1998-1 for Aluminium buildings or extension of the provisions of Section 6 (Specific rules for Steel buildings) to encompass also Aluminium buildings.	✓

Task Ref:	**SC8.T3**	**Task Name:**	Evolution of EN 1998-3
Proposed Task Phase:	**P1**	**Deliverable:**	Thorough updating of EN 1998-3 for assessment and retrofitting of buildings. Improvement of the normative part of the document, making it more user-friendly to the ordinary designer. Extension of the scope of EN 1998-3 to cover "construction" as a whole, encompassing structural, non structural and equipment parts. Extension of the scope of EN 1998-3 to cover the assessment and retrofitting of bridges. The revised Standard should be given a more encompassing title, becoming "Seismic retrofitting of constructions".
Outline Task Scope:		Revision, update and extension of EN1998-3. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1998-1, EN 1998-2, EN 1998-3 and respective National Annexes. Information from the JRC database on the Nationally Determined Parameters	
Justification for inclusion in Phase 1:		For buildings: seismic assessment and retrofitting of buildings is one of the fields in earthquake engineering that has seen important developments in recent years. Additionally, in view of the intention to develop displacement based design rules for new buildings that shall profit of the already existing rules in EN 1998-3, the development of this part should be given priority. For bridges: incorporation of seismic assessment and retrofitting rules for bridges is a major goal of the revision of EN 1998-3. Hence, this activity has to be developed together with the updating of the already existing clauses for buildings to be carried out in Phase1.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Buildings	The growing importance of the sustainable use of construction materials, combined with the need to provide adequate seismic protection to the population, leads to the increasing relevance of the assessment and seismic retrofitting of the very large building stock existing in the most seismically active areas in Europe. This was at the core of the previous decision to develop this Part of EN1998 8 within the first batch of Eurocode parts. However, the field of assessment and retrofitting of structures is relatively new and has evolved rapidly in recent years. Hence some basic concepts and design rules presently included in EN 1998-3 require updating to keep it in pace with developments at world level. Aspects to be added or updated are: a) Use of confidence factors and knowledge levels and also the consideration of other uncertainties as well as risk-based decision criteria in the design procedures for assessment and retrofitting of buildings; b) Use of the concept of Performance levels (in a way coherent with the concept of Limit States generally used in the Eurocodes) should be reviewed to adapt to the specificities of existing structures; c) Extension of clauses related to nonlinear analysis, in order to provide a better guidance for its practical application by ordinary designers. It should be noticed that for existing buildings, the nonlinear analysis is much more important and useful than in the case of new buildings. d) Updating of the current rules of EN 1998-3 related to shear resistance. It should be stressed that the behaviour of elements under large alternate cyclic shear is in many cases the "weak link" in the structures of existing buildings (namely in concrete and masonry) and correspondingly a critical aspect in the retrofitting operation. e) More detailed rules for the design of shear walls and horizontal diaphragms.	In view of the intention to develop displacement based design rules for new buildings (sub task 4 of Task SC8.T1) that shall profit of the already existing rules in EN 1998-3, the development of this Task should be given priority and proceed simultaneously with Task SC8.T1.	Enhancing the possibility of using nonlinear analysis methods for the assessment and retrofitting of existing buildings is very important. In those cases the design options are much more constrained simply because the building does exist. Hence a more realistic and accurate understanding of the structural response is fundamental to underscore the optimal choices (simultaneously with regard to safety, economy and environmental impact) for the retrofit of the structure.	Thorough updating of EN 1998-3 for assessment and retrofitting of buildings. Improvement of the normative part of the document, making it more user-friendly to the ordinary designer.	✓

4	Bridges	Many bridges in roads and railway networks in Europe were built long before the present knowledge on the seismic performance of bridges were available, not mentioning its incorporation in design codes.Thus the seismic vulnerability of those bridges may be quite high, hindering its safety and the reliability of the transportation network, in the event of a severe earthquake.Interventions to evaluate and to reduce such vulnerability are most appropriate and, to some extent, are already being undertaken at national level by some National Authorities.Hence it is proposed to extend the scope of EN 1998-3 (currently dealing only with existing buildings) to cover also the seismic assessment and retrofitting of existing bridges.	-	The main benefit of this action is to enlarge the scope of EN 1998-3 to specifically cover also the seismic retrofitting of bridges. This creates the conditions for a more systematic reduction of the seismic risk associated with bridges at European level, with impact in individual bridges and also in the transportation networks reliability.The use of base isolation and energy dissipation devices in bridge retrofitting operations shall increase the opportunities of using this type of devices with important impact in the industry.	Extension of the scope of EN 1998-3 to cover the assessment and retrofitting of bridges.Accordingly, this Part of EN 1998 should be given a more encompassing title: “Seismic retrofitting of structures”.The provisions shall be mostly applicable to concrete and steel/composite bridges.They shall also cover the retrofitting of foundations and bearings.Introduction of base isolation and/or dissipation devices as part of the retrofitting solution for bridges shall also be addressed.	✓

Task Ref:	**SC8.T4**	**Task Name:**	Evolution of EN 1998-5
Proposed Task Phase:	**P2**	**Deliverable:**	Updating of EN 1998-5 for the inclusion of soil structure interaction in the case of shallow and deep foundations, namely the effect of lateral restraint of piles provided by successive soil layers. Inclusion of specific seismic design provisions for modeling, analysis, dimensioning and detailing of piles.
Outline Task Scope:		Revision and update of EN1998-5. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1998-5 and National Annexes. Information from the JRC database on the Nationally Determined Parameters.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Soil structure interaction	Dynamic soil-structure interaction may influence substantially the seismic response of structures and, accordingly, the consideration of such effects is already required in EN 1998-5 (Foundations, retaining structures and geotechnical aspects) for some specific cases and in all cases in case of pile foundations. However, the provisions therein included are quite generic and there is room to extend and improve them with more practical information to the designer for shallow and deep foundations and for the verification of dynamic base failure. On the other hand there could be cases of pile foundations where soil structure interaction may be disregarded. These cases should be identified for the sake of the ease of use of EN 1998-5.	-	Extension of the practical use of EN 1998-5 to very common cases in foundations of buildings and bridges. Simplification of the design process in cases where soil structure interaction may be disregarded. Improvement of the consistency between EN 1998-5 and Eurocode 7, through proper liaison with CEN/TC250/SC7.	Updating of EN 1998-5 for the inclusion of soil structure interaction in the case of shallow and deep foundations, namely the effect of lateral restraint of piles provided by successive soil layers. Inclusion of specific seismic design provisions for modeling, analysis, dimensioning and detailing of piles. General revision of EN 1998-5 with regard to other geotechnical aspects.	✓

Task Ref:	**SC8.T5**	**Task Name:**	Evolution of EN 1998-4 and EN 1998-6
Proposed Task Phase:	**P3**	**Deliverable:**	Updating of EN 1998-4 and EN 1998-6
Outline Task Scope:		Revision and update of EN1998-4 and EN 1998-6. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1998-4, EN 1998-6 and National Annexes. Information from the JRC database on the Nationally Determined Parameters.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	EN 1998-4	EN 1998-4 covers seismic design of Silos, Tanks and Pipelines. Although less common than Buildings and Bridges, Silos and Tanks may be of significant cost and, in some cases, may pose large risk to the population and/or to the environment in case of failure during a seismic event. The stability of silos and tanks subjected to strong seismic actions may involve rather complex interaction phenomena between soil-structure and stored material (either fluid or granular). Also challenging may be the design of a pipeline system through areas with poor and possibly unstable soils. The contents of EN 1998-4 refers to EN 1998-1 (Seismic action) and to EN 1998-5 (Soil structure interaction) and since these matters are up for revision in those Parts, the corresponding revision of EN 1998-4 is necessary. Furthermore, such revision is also justified by the fact that it is foreseen that other Eurocodes relevant for the design of silos and tanks shall be updated (EN 1991-4, EN 1992-3, EN 1993-4-1 and EN 1993-4-2).	This sub task shall requires interaction with the tasks and subtasks related to the revision of EN 1991-4, EN 1992-3, EN 1993-4-1 and EN 1993-4-2	Revision of the contents of EN 1998-4 to incorporate the more recent developments in the seismic design of silos and tanks. Explicit consideration of performance levels and the corresponding return periods to be used. Improvement of the consistency between EN 1998-4 and Parts 1 and 5 of EN 1998 and with the parts of Eurocodes 1, 2 and 3 dealing with Silos and Tanks.	Thorough updating of EN 1998-4 (including its Annexes) for consistency with the revised versions of EN 1998-1 and EN 1998-5. Possible transfer of part the Informative Annexes contents into Normative text.	✓
4	EN 1998-6	EN 1998-6 covers seismic design of Towers, Masts and Chimneys. The stability of these slender structures very much depends on the long period content of the seismic action (and also on its rotational components) and on the foundation compliance. Accordingly the contents of EN 1998-6 refers to EN 1998-1 (Seismic action) and to EN 1998-5 (Soil structure interaction) and since these matters are up for revision in those Parts, the corresponding revision of EN 1998-6 is necessary. Furthermore, such revision is also justified by the fact that it is foreseen that other Eurocodes relevant for the design of Towers, Masts and Chimneys shall be updated (EN 1990-A3, EN 1993-3-1 and EN 1993-3-2).	This sub task shall requires interaction with the tasks and subtasks related to the revision of EN 1990-A3, EN 1993-3-1 and EN 1993-3-2	Revision of the contents of EN 1998-6 to incorporate the more recent developments in the seismic design of Towers, Masts and Chimneys. Improvement of the consistency between EN 1998-6 and Parts 1 and 5 of EN 1998 and with the parts of Eurocodes 0 and 3 dealing with Towers, Masts and Chimneys.	Thorough updating of EN 1998-6 (including its Annexes) for consistency with the revised versions of EN 1998-1 and EN 1998-5. Possible transfer of part the Informative Annexes contents into Normative text.	✓

Task Ref:	**SC8.T6**	**Task Name:**	Evolution of existing parts of EN 1998 not included in the other tasks
Proposed Task Phase:	**P3**	**Deliverable:**	Revised EN 1998-2
Outline Task Scope:		Reduction of NDPs and enhancement of 'ease of use' in line with requirements of Mandate M/515	
Starting documents:		EN 1998-2	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.		Reduced national variation and improved ease of use of the Eurocodes.	Modified clauses	✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.		Improved ease of use of the Eurocodes for practical users.	Modified clauses	✓
3	Seismic isolation, additional damping and new technologies	The design of Bridges with seismic isolation is covered by Section 7 of EN 1998-2. To the contrary of the corresponding section in EN 1998-1 (for buildings), this section covers already the use of dampers for passive energy dissipation. However, the present section should be updated in view of the more recent technologies in passive control. This shall also be an opportunity to improve the interface between the design standard (EN 1998) and the relevant product standard (EN 15129) since in the current versions of the two standards a consistent interface has not been fully achieved. Additionally this Part should be made consistent with the foreseeable modifications regarding the definition of the sesimic zonation and seismic action that shall be introduced in EN 1998-1	This sub task shall require interaction with CEN/TC340 that is in charge of the development of product standards for antiseismic devices.	The main benefit shall be the improvement of the interface between the products standard and the structural design standard. At present, the technical specification of the antiseismic devices by the structural designer is not straightforward.	Redrafting of Section 7 (Bridges with seismic isolation) of EN 1998-2 and the Annexes related to this subject (Annexes J, JJ and K).	✓

Task Ref:	**SC9.T1**	**Task Name:**	Update and Simplification of all parts of EN 1999
Proposed Task Phase:	**P1**	**Deliverable:**	Partially revised EN 1999-1-1 (supplemented through tasks T2 to T5); Revised EN 1999-1-2; Revised EN 1999-1-3; Revised EN 1999-1-4; Revised EN 1999-1-5
Outline Task Scope:		Update EC 9 with respect to life cycle approach, robustness, fire resistance, design of shell structures and design of cold formed members. Simplify EC 9 in accordance with guidelines from TC 250.	
Starting documents:		1. Life-Cycle Civil Engineering, Ed. Fabio Biondini & Dan M. Frangopol, CRC Press, Taylor &Francis Group 2008 (Sub task 1) 2. COST C26 Action, Sustainability of Constructions, Integrated approach to Lifetime Structural Engineering, Proceedings of Seminar Dresden 6,7 October 2008 (Sub Task 1) 3. New Frontiers in Light Metals. Eds. L Katgerman & F Soetens, 11th INALCO Conference 2010, Eindhoven, June 2010 (Sub task 1) 4. Aluminium Surface Science & Technology, VI international Symposium, ASST-2012, Sorrento, Italy, May 2012 (Sub task 1) 5. A New Classification System for Aluminium Alloy Sections, F.M. Mazzolani, V. Piluso and G. Rizzano, 11th INALCO Conference 2010, Eindhoven, June 2010 (Sub task 1) 6. COST C26 Action. Urban Habitat Constructions under catastrophic events, Chaired by Federico Mazzolani, 2005-2010 (Sub task 2) 7. COST TU0904, Integrated fire Engineering and Response, State of art, March 2011 and Case studies March 2012. (Sub task 3) 8. Cross-sectional classification of Aluminium Beams subjected to Fire, O.R. van der Meulen, J. Maljaars, F. Soetens, 11th INALCO Conference 2010, Eindhoven, June 2010 (Sub task 3) 9. On the fire resistance of aluminium alloy structures, B. Faggiano et al, Proceedings of the COST C12 2005 Final Conference, Innsbruck 20-22 January 2005(Sub task 3) 10. Innovative Issues of the New European Codification on Aluminium Shell Buckling, F.M Mazzolani, T. Höglund and A. Mandara, 11th INALCO Conference 2010, Eindhoven, June 2010 (Sub task 4) 11. 3D Aluminium Structures, F. M. Mazzolani (Key note) Proceedings of the 6th international conference on Thin Walled Structures, Recent research advances and trends, Ed. Dan Dubina and Viorel Ungureanu, Vol.1, Romania 5-7.09.2011 (Sub task 4) 12. Proceedings of the 6th international conference on Thin Walled Structures, Recent research advances and trends, Ed. Dan Dubina and Viorel Ungureanu, Vol.1 and 2, Romania 5-7.09.2011 (Sub task 5) 13. Aluminium Alloy Structures, F. M. Mazzolani, E&FM SPON, 1995 (all sub tasks, including sub task 6) 14. Aluminium Structural Design, Ed. F. M. Mazzolani, Springer Wien New York 2003 (all sub tasks, including sub task 6)	
Justification for inclusion in Phase 1:		Task 1 should be included in phase 1 to allow Tasks 3 to 5 to benefit from the work and its results (interdependencies with Tasks 3 to 5).	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	Selection criteria of materials, including new alloys, in view of a life cycle design approach	The design methods of Eurocode 9 must be oriented to promote the life cycle approach. This work includes introduction of new alloys or semi-products with new dimensions which are launched in the market and which require new design data and selection criteria. The new challenge for the future construction process is to control the use of material and natural sources, which requires a clear knowledge of new materials and technologies as well as appropriate design rules following a continuous process of improvement and upgrading.	-	Life cycle design of aluminium alloys for increasing their use as structural material	New clauses and/or modified clauses in existing EC9 part 1-1.	✓
4	Improvement of design methodologies including robustness	Provisions on robustness and impact resistance relevant specifically for aluminium, to improve the overall safety of aluminium structures. To achieve an updated code which implements results of recent research on the suitability of aluminium to resist impact and improve overall safety.	-	Improvement of overall safety	New clauses and/or modified clauses in existing EC9 part 1-1	✓
5	Improvement of design provisions for fire resistance	The design provisions for fire resistance require some improvements, also for identifying appropriate active protection systems (e.g. sprinklers), which can enhance the global behaviour of many important structures (i.e. large span roofs, glazing systems, etc.). To achieve an updated code which reduces the penalization of aluminium in competition with other materials	-	Reduction of the penalization of aluminium in competition with other materials.	New clauses and/or modified clauses in existing EC9 part 1-2.	✓

6	Improvement of design provisions for shell structures	The design and construction rules for shells require further guidance to make them easier for practical application. Reference to Eurocode 3 should be minimized and replaced by provisions within Eurocode 9 itself. To achieve an updated code, which as far as possible is independent of the provisions of Eurocode 3 both for safety reasons and for economic use of the material	-	Improvement of design provision for shell structures	New clauses and modified clauses in existing EC9 part 1-5.	✓
7	Extend part -1-4 to include design provisions for cold formed members	The present part 1-4 of Eurocode 9 contains provisions only for cold-formed sheeting not for members. Provisions for cold-formed structural members must be added. To expand the scope of the code for including cold-formed members, which are becoming more and more popular	-	Implementation of provisions for cold-formed members, for safety and increased use.	New clauses in existing EC9 part 1-4.	✓

Task Ref:	**SC9.T2**	**Task Name:**	New types of Connection
Proposed Task Phase:	**P1**	**Deliverable:**	Further revised EN 1999-1-1
Outline Task Scope:	Design of new types of connections. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.		
Starting documents:	1. Laser Welding and Hybrid Welding of Aluminum Alloys, S Katayama, Y Kawahito and M Mizutani 11th INALCO Conference 2010, E11th INALCO Conference 2010, Eindhoven, June 2010 2. Friction Welding Method with Translational Friction by intermediate Material, R. Tsujino, M. Hashimoto, K. Matsura and K. Roko, 11th INALCO Conference 2010, Eindhoven, June 2010 3. Sapa, Design manual, 2009 4. Design of Connections, F. Soetens, B. W. E. M. van Hove, in Aluminum Structural Design, Ed. F. M. Mazzolani, Springer Wien New York 2003 5. Fatigue of friction stir welds, S. Kahl, HERON 55 No. ¾ 2010 6. Eurocode 9 to estimate the fatigue life of friction stir welded aluminum panels Original Research Article, Engineering Structures, Volume 45, December 2012, Pages 307-313, Meysam Mahdavi Shahri, Torsten Höglund, Rolf Sandström		
Justification for inclusion in Phase 1:	Task 2 should be included in phase 1 to allow Tasks 3 to 5 to benefit from the work and its results (interdependencies with Tasks 3 to 5).		

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Design methodologies for new types of connections not yet covered	Connection technology is continuously improving and some special types are now entering into current practice (i.e. adhesive bonded connections, friction stir welding, hollow section connections, bolt channel connections, etc.), but for them there is a lack of design provisions which must be covered. The availability of advanced design methods for new technological systems for innovative types of connections will ensure an improvement of the quality of the products.	In connection with SC9.T1	Updated design provisions covering recently developed connection methods which are now of common use	New clauses in existing EC9 part 1 .1.	✓

Task Ref:	**SC9.T3**	**Task Name:**	Roofing
Proposed Task Phase:	**P2**	**Deliverable:**	Further revised EN 1999-1-1 by new Annex
Outline Task Scope:		New provisions for roofing. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		1. Two Twin Aluminum Domes of the Enel Plant in Civitavecchia (Italy), F. M. Mazzolani, 11th INALCO Conference 2010, Eindhoven, June 2010 2. Domes in the Enel plant, F. M. Mazzolani, HERON 55 No.3/4, 2010 3. Aluminum Structures in Restoration Project of the Mercati Traianei in Rome, F. M. Mazzolani, 5th int. Congress Restoration of Architectural Heritage, Firenze, 17-24 September 2000	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Design methodologies and structural details for space frames and special roofing systems	The introduction in the market of new structural typologies in the field of large structures for roofing, requires specific design rules, which must be tailored and detailed with regard to the specific material properties and construction technology. This will enable the benefits of using aluminum in such situations to be realized, stemming particularly from its corrosion resistance and light weight.	Partly dependent on SC9.T1 and T2	New aluminium structural systems	New Annex to EC9 part 1-1.	✓

Task Ref:	**SC9.T4**	**Task Name:**	Bridging
Proposed Task Phase:	**P2**	**Deliverable:**	Further revised EN 1999-1-1 by new Annex
Outline Task Scope:		New provisions on bridging. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		1. Canadian Standard Association, Design of Aluminium Bridges, 2010 2. The use of aluminium in the restoration of the "Real Ferdinando" bridge on the Garigliano river, Festschrift Ehren Von Prof. Dr. Ing. Günther Valtinat Herausgegeben von Jürgen Priebe und Ulrike Eberwien, Druck: General Anzeiger, Rhauderfehn 2001 3. Use of Aluminium Alloys in Retrofitting Ancient Suspension Bridges, F. M. Mazzolani and E. Mele, Int. Conf. on Composite Construction – Innsbruck September 1997,	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Design methodologies and structural details for special bridge systems, including rehabilitation of existing bridges	The introduction in the market of new structural typologies for bridges, as well as the use of aluminium for rehabilitation of old bridges made of steel and/or reinforced concrete, requires specific design rules, which must be tailored and detailed with regard to the specific material properties and construction technology. This will enable the benefits of using aluminum in such situations to be realized, stemming particularly from its corrosion resistance and light weight.	Partly dependent on SC9, T1 and T2	New aluminium structural systems.	New Annex to EC9 part 1-1.	✓

Task Ref:	**SC9.T5**	**Task Name:**	Facades
Proposed Task Phase:	**P3**	**Deliverable:**	Further revised EN 1999-1-1 by new Annex
Outline Task Scope:		New provisions for aluminium and glass facades. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		1. Architectural Envelopes, Permasteelisa Group, 2003 2. COST TU0701 Action, Improving the quality of suburban building stock, University of Malta 2010	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Design methodologies and structural details for the combination of aluminum and glass in structures	In connection with CEN/TC250/WG3 "Structural Glass", the modern facades of architecturally important buildings are made of metal (very often aluminum) and glass in a synergetic structural combination which requires the set-up of appropriate calculation methods. Availability of design provisions for the new types of structures comprising the integrated use of glass and aluminum	New Eurocode on Structural Glass (TC250/WG3)	Development of new aluminum structural systems	New Annex to EC9 part 1 1	✓

Task Ref:	**WG2.T1**	**Task Name:**	Assessment and Retrofitting of Existing Structures – General Rules / Actions.
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and technical report for Existing Structures. CEN Technical Specifications (CEN/TS) on: Assessment and Retrofitting of Existing Structures - General Rules Assessment and Retrofitting of Existing Structures - Actions
Outline Task Scope:			Development of new harmonised European technical rules for existing structures, which are related to the principles and fundamental requirements of the EN Eurocodes. Thus, the technical rules for existing structures are not self-standing rules but they complement rules of the relevant EN Eurocodes by identifying and distinguishing the differences between the design of new structures and the assessment and retrofitting of existing structures. The application of design-orientated methods to the assessment of existing structures often leads to a high degree of conservatism. This conservatism has severe economic, environment and socio-political consequences when it results in satisfactory structures being condemned as unsafe, thereby leading to an unnecessary investment of resources in replacement or retrofitting, with its associated disruption. This is why the assessment of existing structures often requires the application of refined methods that are beyond the scope of design codes for new structures. That is the reason that over the last 20 years, methodologies inherent to existing structures have evolved in many countries and applied on a national level. However they have not yet been generally adopted in broad practice. Therefore it is an urgent need for bringing together the different national approaches to a broadly accepted, coherent and harmonised set of rules for existing structures complementing those for the design of new structures. TC 250 has decided that the development of new Parts of the Eurocodes should be achieved in steps, as follows: 1. Preparation of technical rules in form of recommendations as "Scientific and Technical Reports". 2. After acceptance of "Scientific and Technical Reports" by CEN/TC250, adaption of it into CEN Technical Specification. 3. Upon the agreement of CEN/TC250, conversion of the CEN Technical Specification into a Eurocode Part. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.
Starting documents:			Scientific and Technical Report: Assessment and Retrofitting of Existing Structures – General Rules (e.g. JRC, 2013) International and national source documents (a comprehensive list is held by WG2).
Justification for inclusion in Phase 1:			The new strategy of continuing to use existing structures is of great significance due to environmental, economic and socio-political assets. It will be a new challenge, growing larger every year, for architects and engineers and a new focus for the construction industry with a new technical basis and a change of market and of the main activities. The application of design-orientated methods to the assessment of existing structures often leads to a high degree of conservatism. This conservatism has severe economic, environment and socio-political consequences when it results in satisfactory structures being condemned as unsafe, thereby leading to an unnecessary investment of resources in replacement or retrofitting, with its associated disruption. This is why the assessment of existing structures often requires the application of refined methods that are beyond the scope of design codes for new structures. That is the reason that over the last 20 years, methodologies inherent to existing structures have evolved in many countries and applied on a national level. However they have not yet been generally adopted in broad practice. Therefore it is an urgent need for bringing together the different national approaches to a broadly accepted, coherent and harmonised set of rules for existing structures complementing those for the design of new structures. The broad interest in the development of an European-wide harmonised and acknowledged coherent set of technical specifications (TS) or Eurocode parts for the assessment and retrofitting of existing structures is demonstrated by the impressive number of 35 highly motivated members in CEN/TC250/WG2 bringing in their specific expertise. Finally, the general part will be the basis for the development of the whole set implementing coherent rules for all types of structures and all materials. Bridge authorities are interested in agreed methods to assess the safety, and durability of existing bridges and to make appropriate provisions for more refined methods for the evaluation and maintenance. One of the main issues is the evolution of loadings. The change of traffic flow, the exposure to climate actions, and extreme immissions may impair the long term behaviour of a structure. This all may affect the safety, serviceability and durability of existing bridges. At the same time many of the European railway bridges are getting close to the end of their previously intended service life. The part dealing with actions in combination with the general part will be, again the basis for all types of structures and materials.

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	General Rules Step 1: Preparation of Scientific and Technical Report for Existing Structures	The initiative is motivated by the lack of an applicable set of European-wide technical rules to deal with the enormously expanding construction activities in assessing and retrofitting buildings and engineering works. The approach to the assessment of an existing structure is in many respects different from that in designing new structures. The effects of the construction process and subsequent life of the structure, during which it may have undergone alteration, deterioration, misuse and other changes to its as-built (as-designed) state, need to be taken into account. It is thus possible to obtain and gain more or less detailed information on a specific structure. This is one of the fundamental differences with respect to the methodology used for the design of new structures where uncertainties are dealt with by relying on information gained from experience. In this respect the evaluation and updating of information with regard to the actions as well as with regard to the mechanical resistance is one of the key issues when assessing existing structures in order to reduce uncertainty. The target reliability level for existing structures has to be examined taking into account the remaining service life time and the proportionality of interventions. Concepts of interventions include long-term considerations and are obtained by optimisation of intervention variants as derived from the results of the examination and assessment. The scope of the new European technical rules for the assessment and retrofitting of existing structures is intended to be used for all types of buildings, bridges, and construction works including geotechnical aspects, exposed to all kind of actions.	The general part will be the basis for the development of the whole set implementing coherent rules for all types of structures and all materials. A packaging of the whole set for rules for assessment and retrofitting of existing structures in two phases is reasonable from different point of view. In consideration of the strong interrelation between the material independent parts, such as general rules and actions, on one side and the material dependant parts for the different construction works on the other hand, it is extremely important that the two first parts with general rules and actions are developed prior to the following parts for all the different kind of materials.	The future of construction works should be closely governed by the sustainable development of urban and industrial areas and infrastructure, which results in modifications, replacement or extension of existing buildings and civil engineering works. A sustainable development will not simply respond to new needs by adding new buildings to the existing building stock or demolish old structures and simply substitute them with new ones. It will analyse existing structures to identify their potential for being included in new developments. The retrofitting of structures offers very efficient ways for improving existing building envelopes and the creation of new, energy efficient ones with the introduction of new technologies for upgrading the quality of existing business, industrial and residential buildings. The application of design-orientated methods to the assessment of existing structures often leads to a high degree of conservatism. This conservatism has severe economic, environment and socio-political consequences	Scientific and Technical Report for assessment and retrofitting of Existing Structures. The new European technical rules for existing structures are related to the principles and fundamental requirements of the EN Eurocodes. Thus, the technical rules for existing structures are not self-standing rules but they complement rules of the relevant EN Eurocodes by identifying and distinguishing the differences between the design of new structures and the assessment and retrofitting of existing structures.	

				when it results in satisfactory structures being condemned as unsafe, thereby leading to an unnecessary investment of resources in replacement or retrofitting, with its associated disruption. Owners of existing structures, real estate agents and other partners interested in the technical performance of the structure ask questions about the reliability e.g. related to permissible loading. They are interested in profiting from a successful assessment or retrofitting in realising a higher value of the real estate or rental. Bridge authorities are therefore interested in agreed methods to assess the safety, and durability of existing bridges and to make appropriate provisions for more refined methods for evaluation and maintenance.		
2	General rules Step 2: Conversion of the Scientific and Technical Report into CEN Technical Specifications for General rules for Existing Structures	The main work of WG 2 will be the drafting of the rules for the Part of the Eurocode on Assessment and Retrofitting of existing structures, using the Scientific and Technical report and the comments thereon. In view of the key issues the main topics to be covered by the new European technical rules on assessment will be: - methodology of collecting, evaluating and updating data, - recommendations for the verification applying the partial factor method and/or using directly the probabilistic methods consistent with EN 1990 - target reliability level of existing structures taking into account residual life time, consequences and costs of safety measures, - assessment based on satisfactory past performance, - recommendation concerning intervention and report. Furthermore a common approach for the assessment should be include the following principles: - the frame of currently valid EN Eurocodes for the verification of structural reliability should be applied, - the original design documentation including drawings may be essential for evaluating characteristics of materials, actions, geometric data and structural behaviour and are the starting point for updating information, - Historic National Codes valid in the period when the structure was designed may be used as guidance documents to identify possible critical problem areas. In consequence the generic part complementary to EN 1990 will address the following items: 1. General (scope, references, assumptions, terms and definitions), 2. Requirements, 3. Updating information (general, actions, material properties, geometrical properties, structural models, resistances and deformations) 4. Structural analysis and verifications (verification by partial factors, verification by probabilistic methods, risk analysis), 5. Examination (procedures, condition survey, condition evaluation, concept of interventions) 6. Interventions (retrofitting and modification, survey and monitoring, maintenance, immediate safety interventions).	Scientific and Technical Report for Existing Structures	As above	In a first step technical specifications (CEN/TS) are developed which may be converted in a second step into a Eurocode part after general recognition by the relevant standardisation bodies. With regard to general aspects it will be: CEN/TS "Assessment and retrofitting of existing structures - General rules" as a complement to EN1990 Basis of Structural Design	✓
3	Actions Step 2: Adaptation of the principles of the Scientific and Technical Report and conversion into CEN Technical Specifications for Actions	A sustainable development will not simply respond to new needs by adding new buildings to the existing building stock or demolish old structures and simply substitute them by new ones: It will analyse existing structures to identify their potential for being included in new developments. Owners of existing structures, real estate agents and other partners interested in the technical performance of the structure put questions on the reliability e.g. related to permissible loading. They are interested to profit from a successful assessment or retrofitting in realising a higher value on the real estate or rent market. Bridge authorities are interested in agreed methods to assess the safety, and durability of existing bridges and to make appropriate provisions for more refined methods for the evaluation and maintenance. One of the main issue is the evolution of loadings. The change of traffic flow, the exposure to climate actions, and extreme emissions may impair the long term behavior of a structure. This all may affect the safety, serviceability and durability of existing bridges. At the same time many of the European railway bridges are getting close to the end of their previously intended service life. The objective of the structural analysis is to determine the behavior of an existing structure considering relevant situations and given conditions during the remaining service life for which the structure has to fulfill the requirements for structural safety and serviceability. Updating of actions on a given existing structure implies focused determination of characteristic values and other more detailed information of the actions by means measurements and refined modeling. In many cases it is justified to use different or modified load models for the assessment of existing structures taking into account statistical considerations.	Scientific and Technical Report for Existing Structures – General Rules The new European technical rules for the assessment and retrofitting of existing structures will be developed using the existing organization of CEN/TC250. In general, the works are initiated and carried out by WG2. However, WG2 shall be supported by the relevant SC's, as the technical competent bodies in their scope. In this respect WG2 is acting in function of a coordinating group. *Note:* *The specific aspects of assessment and retrofitting of existing structures exposed to seismic actions is the scope of Part 3 of EN 1998.* *Therefore the aspects with regard to earthquake are not treated in this work item.*	As above	CEN/TS: "Assessment and retrofitting of existing structures - Actions on structures"as a complement to EN1991 actions on structures	✓

Task Ref:	**WG2.T2**	**Task Name:**	Assessment and Retrofitting of Existing Structures - Concrete Structures. This task is solely coordination with SC2.
Proposed Task Phase:	**P2/3/4** **- It will depend on the work of the SCs**	**Deliverable:**	CEN Technical Specifications (conversion/adaptation of the Scientific and Technical Report): Assessment and Retrofitting of Existing Structures – Concrete Structures
Outline Task Scope:		Development of new harmonised European technical rules for existing structures, which are related to the principles and fundamental requirements of the EN Eurocodes. Thus, the technical rules for existing structures are not self-standing rules but they complement rules of the relevant EN Eurocodes by identifying and distinguishing the differences between the design of new structures and the assessment and retrofitting of existing structures. The application of design-orientated methods to the assessment of existing structures often leads to a high degree of conservatism. This conservatism has severe economic, environment and socio-political consequences when it results in satisfactory structures being condemned as unsafe, thereby leading to an unnecessary investment of resources in replacement or retrofitting, with its associated disruption. This is why the assessment of existing structures often requires the application of refined methods that are beyond the scope of design codes for new structures. That is the reason that over the last 20 years, methodologies inherent to existing structures have evolved in many countries and applied on a national level. However they have not yet been generally adopted in broad practice. Therefore it is an urgent need for bringing together the different national approaches to a broadly accepted, coherent and harmonised set of rules for existing structures complementing those for the design of new structures. The development of new Parts of the Eurocodes should be achieved in steps, as follows: 1. Preparation of technical rules in form of recommendations as "Scientific and Technical Reports". 2. After acceptance of "Scientific and Technical Reports" by CEN/TC250, adaption of it into CEN Technical Specification. 3. Upon the agreement of CEN/TC250, conversion of the CEN Technical Specification into a Eurocode Part. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Scientific and Technical Report: Assessment and Retrofitting of Existing Structures – General Rules (e.g. JRC, 2013) International and national source documents (see separate list of WG2)	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Concrete Structures Step 2: Adaptation of the principles of the Scientific and Technical Report and conversion into CEN Technical Specifications for concrete structures	The standards for the different type of structures such as concrete, steel, composite steel and concrete, timber, masonry and aluminium structures should provide provisions regarding characteristic values of building materials from the past as well as connections and structural details frequently used in existing structures. The material oriented parts focus on the specific rules for updating information of material properties as well as on refined models for. In addition they may describe refined models for the analysis of the structural behaviour at ultimate and serviceability limit states and for the calculation of the structural resistance. The main issue of material oriented rules concerns the methodologies for concepts of interventions including retrofitting and strengthening existing structures. Concepts of interventions include long-term considerations and are obtained by optimisation of intervention variants as derived from the results of the examination and assessment. Concepts of interventions include long-term considerations and are obtained by optimisation of intervention variants as derived from the results of the examination and assessment. Intervention concepts may include operational and/or constructional interventions to be performed. The following strategies of interventions may be classified: - intensified surveying (e.g. monitoring), - restriction in the use of the structure. - rehabilitation or retrofitting of the structure, - modification of the structure.	Scientific and Technical Report for Existing Structures - General Rules The new European technical rules for the assessment and retrofitting of existing structures will be developed using the existing organization of CEN/TC250. In general, the works are initiated and carried out by WG2 However, WG2 shall be supported by the relevant SC's, as the technical competent bodies in their scope. In this respect WG2 is acting in function of a coordinating group.		CEN/TS: Assessment and retrofitting of existing structures: - "Concrete structures" as a complement to EN1992 design of concrete structures; - "Steel structures" as a complement to EN1993 design of steel structures; - "Composite steel and concrete structures" as a complement to EN1994 design of composite steel and concrete structures; - "Timber structures" as a complement to EN1995 design of timber structures; - "Masonry structures" as a complement to EN1996 design of masonry structures; - "Geotechnical design" as a complement to EN1997 geotechnical design; - "Aluminium structures" as a complement to EN1996 design of aluminium structures.	✓

Task Ref:	**WG2.T3**	**Task Name:**	Assessment and Retrofitting of Existing Structures – General Rules / Actions. Preparation of EN
Proposed Task Phase:	**P4**	**Deliverable:**	EN on Assessment and Retrofitting of Existing Structures - General Rules EN on Assessment and Retrofitting of Existing Structures - Actions
Outline Task Scope:		Conversion of CEN/TS to EN made up of two parts. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		CEN TS of WG2.T1	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	General rules Step 3: Conversion of the CEN Technical Specifications into EN Eurocode for Existing Structures - General rules	The main work of WG 2 will be the analysis and briefing of the feedback from use of the CEN Technical Specifications for Existing Structures and the comments of the MS as a result of the consultation. Adaption and harmonisation of the general rules and conversion into an EN Eurocode Part	CEN Technical Specifications for Existing Structures - General Rules		EN Eurocode for Existing Structures - General rules	✓
2	Actions Step 3: Conversion of the CEN Technical Specifications into EN Eurocode for Existing Structures - Actions	The main work of WG 2 will be the analysis and briefing of the feedback from use of the CEN Technical Specifications for Existing Structures and the comments of the MS as a result of the consultation. Adaption and harmonisation of the general rules and conversion into an EN Eurocode Part	CEN Technical Specifications for Existing Structures - Actions		EN Eurocode for Existing Structures - Actions	✓

Task Ref:	**WG3.T1**	**Task Name:**	Structural Glass – Preparation of Scientific and Technical Report
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and technical report.
Outline Task Scope:	The structural use of glass is becoming more widespread in Civil Engineering to realize new structure made of Glass. The aim of WG3.T1 is to draw up a scientific and technical report on the subject of the design of new load bearing structures made of Glass. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.		
Starting documents:	Existing guidelines on the state of the art, needs and approach for Codification of the Design of Load Bearing Structures of Glass.		
Justification for inclusion in Phase 1:	Many countries of the European Community are involved in drawing up guidelines for the design of structures made of structural Glass. It is extremely important to harmonize the efforts and produce a document which takes into account the different experiences. The document will contribute to promote a broader market for this kind of structures and ensure an adequate reliability of them.		

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Preparation of Scientific and Technical Report	The Scientific and Technical Report will give an overview on the state of the art of designing glass structures, the material variety and products to be used as well as on safety and reliability approaches for different purposes in a structure. This shall be done considering the particular material behaviour of glass, also in view of the latest research results. Furthermore, the report will provide background information on existing national standards on designing glass structures (as far as they are available) and European standards on material strengths of different type of glass. Also, information on relevant interlayer material will be provided. The report contains also a survey on the different application fields of glass in structures, the respective failure potential and the resulting failure consequence class according to EN 1990. Thus, the resulting classification system of different application will represent a strong orientation for successive design rules. The Scientific and Technical Report will be written according to the resolution 255 of TC 250. Delivery of the report is expected by end of March 2013 at the latest. JRC has agreed on publishing the report.	Prenormative starting basis for the subsequent codification works acc to res. 255 of CEN TC 250	The benefit of this work item is to provide: - an overview on the state of the art; - the classification of the technical scientific status on glass structures of different applications; - the creation of a consequence-class-oriented structure, developed from the principles of EN 1990 and EN 1991, that serves as a guiding map for the requirements for design rules and detailing; - an knowledge and data pool, containing the recent results on design of glass structures, gained from all relevant sources; - the option to align European expertise.	The concrete output will be a Scientific and Technical Report on Glass in primary and secondary load bearing structures, containing all relevant information, explication and data on the latest technical-scientific level, able to be accepted by CEN/TC250. Thus it shall serve as background to the elaboration of a new CEN TS on Structural Glass.	

Task Ref:	**WG3.T2**	**Task Name:**	Structural Glass – Preparation of CEN TS
Proposed Task Phase:	**P1**	**Deliverable:**	CEN TS on Structural Glass
Outline Task Scope:		Conversion of Scientific and Technical Report to CEN TS made up of three parts. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Scientific and Technical Report of WG3.T1.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work (including any additional comments / notes)	Interdependencies Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence. (Independencies within individual Tasks do not need to be identified)	Key benefits	Output (e.g. new Eurocode part; new or modified clauses in existing Eurocode part)	Priority item for EC contract
1	Conversion of Scientific and technical report to CEN TS: General Rules and Materials	The first part of CEN TS "Structural Glass" will deal with the principals of the design of glass structures, its components, joints and connections and its supports. A relation to EN 1990 and EN 1991 has to be figured out with regard to the special material characteristics of glass according to the application situation and its respective consequence class. Glass is a brittle material. This shortcoming can be compensated by using laminated glass sections together with an adequate degree of thermal prestressing that provides an optimum fracture pattern. To avoid personal injuries or economic losses, in addition to the strength and stability verification in the Ultimate Limit State as well as to the verification in the Serviceability Limit State, the residual load-bearing capacity after breakage often has to be assessed. Thereby, the degree to what extent this residual load-bearing capacity has to be provided, is matter of the estimation of failure consequence-class acc. to EN 1990. The material characteristics of the European Glass Product Standards are derived from bending tests, thus, generally, strength of glass so far has been always assumed to be bending resistance. However, for the use of structural elements, its joints and supports, like point supported panels, beams and columns and also in plane loaded mechanical fasteners, additional strength values are strongly needed and necessary. In due consideration of the composite action enabled by the interlayer of laminated glass, dependant on time and temperature, the actual stresses and the deformations in glass components subjected to bending are significantly lower. Even though there are a lot of proposed procedures of taking into account this beneficial effect, there is still a lack of rules giving test procedures to verify the interlayer stiffness characteristics. Also, the consideration of new material developments that allow for a higher and a far more reliable utilisation of the composite action will allow for a substantial step ahead as conventional PVB-interlayers have provided. A harmonisation both for testing techniques and for calculation techniques of the composite action, dependant on duration and thermal effects, is needed and will be specified in this part. Further, in combination with the test standards (EN 1288) and the product standards the statistical evaluation of the glass strength shall be analysed and reversed in respect to the requirements of EN 1990 and the special glass failure characteristics. Then, the General Rules must include a definition of the consequence classes of glass products and glass applications. The material safety factors depending on the glass type, the glass assembly (e.g. monolithic or laminated panels) and the consequence class are to be evaluated and specified in this part. Finally, the general rules will also consider aspects like the fire resistance and the sustainability of glass products.	Scientific and Technical Report	The benefits of this work are: - test methods for the determination of the glass strength according to in-plane loading, shear loading at glass holes, bending loading of holes, etc. - a test method for the determination of the time - and temperature -dependent shear stiffness of interlayer - a harmonised statistical evaluation method for the glass strength - material safety factors for different glass products depending on the consequence class - Definition of exposition classes - Definition of the load bearing capacity of glass components and how to design in the ULS - Definition of the criteria for serviceability limit states and how to design in the SLS - Definition of the load duration of actions - Definition of the verification of the residual load-bearing capacity in general in respect to the brittle behavior of glass and also in respect to exceptional action combinations - Definition of the actions depending on the application - Definition of the combination of actions, all with special regard and consideration of EN 1990 and EN 1991. - Definition of different design scenarios after breakage of glass layers of laminated glass, the respective design methodologies and the corresponding safety requirements	New CEN TS Structural Glass – Part 1	✓
2	Conversion of Scientific and technical report to CEN TS : Design of plates, its supports and Fixations	A lot of glass applications are such as glass plates in facades, roofs, balustrades and glass floors however under structural safety conditions.The elements can be linear supported at the edges or be held in position with point fixings. The general calculation methods dealing with the static and dynamic behaviour of thin plates (plate theories, meshing approaches of FEM as well as stiffness approaches of supporting structure etc.), particularly of laminated glass plates must be defined.The same applies for the supports, continuous fixations and point fixations. Depending on the consequence classes defined in "CEN TS Structural Glass part 1" failure scenarios have to be defined considering the application case. Calculations methods or test procedures must be fixed to evaluate the residual load-bearing capacity.Independent of the structural function and importance of a glass component, the durability of insulation glazing is related to the climatic loading and the resistance of the edge bond. Till now there are no basics for a design of the edge bond although there is a respective demand from the industry. Apart from the structural safety this is also a strong sustainability oriented issue. A differentiation of the static behavior is necessary depending on the deformation of the substructure.	Scientific and Technical Report	Definition of approach and the mechanical calculation methods for glass plates depending on- the glass assembly: monolithic, laminated, insulated- the support conditions: linear, punctual, small or large deformations of the substructure- dynamic loading (e.g. personnel impact)Definition of the requirements for the residual resistance in form of e.g. glass assemblies and support conditions depending on the application or a test procedure.Definition of limit values. This bunch gives a comprehensive set of rules for the design of plates, supports and fixations for structural issues. This also comprises the design in different design scenarios after breakage of glass layers and its corresponding safety reqirements	New CEN TS Structural Glass – Part 2	✓

3	Conversion of Scientific and technical report to CEN TS: Design of primary Members of Glass, Beams, Columns and Special Joints	Till now, there are no national regulations concerning the design of primary members of glass. First of all, the calculation methods for the stresses and the stability effects have to be fixed on the basis of the research projects of the recent years.	Scientific and Technical Report	Calculation and design methods for beams, columns and shear elements in respect to the buckling collapse. Calculation and design methods for load bearing connections. Furthermore constructive regulation must be given to produce robust transparent primary glass components.	New CEN TS Structural Glass – Part 3	✓

Task Ref:	**WG3.T3**	**Task Name:**	Structural Glass – Preparation of EN
Proposed Task Phase:	**P4**	**Deliverable:**	EN on Structural Glass
Outline Task Scope:		Conversion of CEN TS to EN made up of three parts. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		CEN TS of WG3.T2	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Conversion of CEN TS to EN: General Rules and Materials	On the basis of the CEN TS Structural Glass part 1 a harmonisation will be necessary to conduct an adjustment of the standard in Europe and to convert Eurocode from CEN TS into EN status. For this, particularly the glass producers will be asked to provide further recent data on stabilities of material values and the warranted material strength. For the conversion this works (to be carried out in parallel) has then to be taken into account. Further, there will be enlarged verification methods concerning insulation glass, thermal stress distribution, glass beams, glass columns etc.	Scientific and Technical Report; CEN TS Structural Glass – Part 1	The benefits are: Consistent basis of design for glass components. Enlarged verification methods concerning insulated glazing, thermal stresses, glass beams, glass columns, etc.	EN X Structural Glass – Part 1 Harmonized Product standards Harmonized EN 1288 Harmonized EN 1990 in view of glass structures Harmonized EN 1991 in view of glass structures	✓
2	Conversion of CEN TS to EN: Design of plates, its supports and Fixations	On the basis of the CEN TS Structural Glass part 2 a harmonisation for glass plates is possible to conduct an adjustment of the standard in Europe and to convert Eurocode from ENV into EN status. For this, the further recent research and development work, carried out in parallel, has then to be taken into account.	Scientific and Technical Report CEN TS Structural Glass – Part 2	Harmonized regulations for glass plates in consideration of a verification of ultimate limit state, serviceability limit state and residual resistance for structural cases at the latest state of the art.	EN X Structural Glass – Part 2	✓
3	Conversion of CEN TS to EN: Design of primary Members of Glass, Beams, Columns and Special Joints	On the basis of the CEN TS Structural Glass part 3 the Eurocode will be the first standard for primary glass structures in consideration of recent research results. For this the further research and development work, to be carried out in parallel, has then to be taken into account.	Scientific and Technical Report CEN TS Structural Glass – Part 3	Harmonized regulations for primary members and joints of glass.	EN X Structural Glass – Part 3	✓

Task Ref:	**WG4.T1**	**Task Name:**	Fibre Reinforced Polymers – Preparation of Scientific and Technical Report
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and technical report
Outline Task Scope:	The structural use of composite materials with a polymer matrix reinforced with long glass, carbon or aramid fibres (FRPs) is becoming more widespread in Civil Engineering to realize new construction entirely made of FRP components. Such components are usually obtained through pultrusion, infusion or molding, and include sandwich structures. They are assembled using either adhesive or bolted joints. There are numerous advantages associated to the use of FRPs, including: light weight, high mechanical properties and excellent resistance to corrosion. The aim of WG4.T1 is to draw up a scientific and technical report on the subject of the design of new structures entirely made of FRP. The approach to structural safety will be based on the semi-probabilistic limit states method (Serviceability Limit States, SLS, and Ultimate Limite States, ULS). Moreover, in the format of the Eurocodes, the various statements will be divided into Principles and Rules of Application. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.		
Starting documents:	Existing guidelines: EuroComp Design Code and Handbook, EN 13706 standard, Italian National Research Council (CNR) Design Guide (DT 205/2007), Revised CUR96 FRP Composite Structures, Manuals of Practice (MOP) #102 published by the Construction Institute of the American Society of Civil Engineers (ASCE).		
Justification for inclusion in Phase 1:	Many countries of the European Community are involved in drawing up guidelines for the design and verification of new structures entirely made by FRP elements. It is extremely important to harmonize the efforts and produce a document which takes into account the different experiences. The document will contribute to promote a broader market for this kind of structures and ensure an adequate reliability of them. The broad interest in the development of an European-wide harmonized and acknowledged coherent set of technical rules for the design of FRP new constructions is demonstrated by the high number of 18 motivated members in CEN/TC250/WG4 bringing in their specific expertise.		

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Preparation of Scientific and Technical Report	The Scientific and Technical Report will give an overview on the state of the art of designing new structures entirely made by FRP elements. Furthermore it will provide guidelines for the design of fibre reinforced plastics new structures used in buildings and civil engineering works. This shall be done considering the particular material behaviour, also in view of the latest research results. The report will also provide a background on existing national standards dealing with the subject and European standards on material strengths of different type of FRPs. The Scientific and Technical Report will be written according to the resolution 255 of TC 250. Delivery of the report is expected by end of June 2014 at the latest. JRC has agreed on publishing the report. The Scientific and Technical Report is expected to include the following: 1. General 1.1 Subject and scope 1.2 Normative references 1.3 Assumptions 1.4 Terms and definitions 1.5 Symbols 2. Basis of Design 2.1 Basic requirements 2.2 Service life of the structure 2.3 Durability and robustness requirements 2.4 General design principles 2.4.1 General 2.4.2 Calculation 2.4.3 Properties of materials 2.4.4 Design capacity 2.4.5 Partial coefficients 2.4.5.1 Materials 2.4.5.2 Joints 2.4.5.3 Resistance models 2.5 Special problems and relevant conversion factors 2.5.1 Environmental correction factor 2.5.2 Conversion factors for long-term effects 3. Materials 3.1 General 3.2 Fibres 3.2.1 General 3.2.2 Glass fibres 3.2.3 Carbon fibres 3.2.4 Aramid fibres 3.3 Resins 3.4 Structural elements obtained by pultrusion		The benefit of this work item is to provide: - an overview on the state of the art, - the formulation of general principles and rules of application for the design and verification of constructions entirely made of FRP elements, - the option to align European expertise.	The concrete output will be a Scientific and Technical Report on the design and verification of FRP structures, containing all relevant information, explication and data on the latest technical-scientific level, able to be accepted by CEN/TC250. Thus it shall serve as background to the elaboration of CEN TS.	

		3.5 Other manufacturing process 3.5.1 Compression molding 3.5.2 Resin transfer molding 3.5.3 Filament winding 3.6 Sandwich structures 4. Basis of Structural Analysis 4.1 Analysis criteria 4.2 Verification criteria 4.3 Strain evaluation 4.4 Behaviour in the case of fire 4.5 Design assisted by testing 4.6 Requirements for fasteners 4.7 Open problems 4.8 References 5. Ultimate Limit States 5.1 Axial force 5.1.1 Elements under traction 5.1.2 Compressed elements 5.2 Flexure 5.2.1 In-plane flexure 5.2.2 In-plane tenso-flexure 5.2.3 In-plane compression-flexure 5.3 Shear 5.4 Torsion 5.5 Combined stress resultants 5.6 Open problems 5.7 References 6. Serviceability Limit States 6.1 Stress verifications 6.2 Strain verifications 6.3 Open problems 6.4 References 7. Connections 7.1 General 7.2 Design criteria 7.3 Bolted joints 7.3.1 General 7.3.2 Verification of bolted joints subject to shear 7.3.3 Verification of bolted joints subjected to strain 7.3.4 Design by testing of bolted joints 7.3.5 Open problems 7.3.6 References 7.4 Glued joints 7.4.1 General 7.4.2 Verification of glued joints subjected to shear 7.4.3 Verification of glued joints subjected to combined stress resultants 7.4.4 Bonding control 7.4.5 Design by testing of glued joints 7.4.6 Open problems 7.4.7 References 8. Execution				

Task Ref:	**WG4.T2**	**Task Name:**	Fibre Reinforced Polymers – Preparation of CEN TS
Proposed Task Phase:	**P3**	**Deliverable:**	CEN TS on Fiber Reinforced Polymers
Outline Task Scope:		Conversation of Scientific and Technical Report to CEN TS. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Scientific and Technical Report of WG4.T1	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Conversation of Scientific and technical report to CEN TS.	When completed by the WG4, the technical rules and recommendations contained in the Scientific and Technical Report will be given to CEN/TC250 for agreement to publish. The published report will be exposed to some form of comment so that CEN/TC250 can discuss whether to accept the technical rule and recommendations as being suitable for progression to the next step.	Scientific and Technical Report		New CEN TS	✓ (subject to extension of mandate to include FRP)

Task Ref:	**WG5.T1**	**Task Name:**	Membrane Structures - Preparation of Scientific and Technical Report
Proposed Task Phase:	**P1**	**Deliverable:**	Scientific and technical report.
Outline Task Scope:		Membrane structures are becoming more widespread in Civil Engineering to realize new construction entirely made by applying tensile structures principles and technology. There are numerous advantages associated to the use of Membrane structures, including: light weight, high mechanical properties and the possibility to cover vast open spaces. The aim of WG5.T1 is to draw up a scientific and technical report on the subject of the design of Membrane Structures. The approach to structural safety will be based on the semi-probabilistic limit states method (Serviceability Limit States, SLS, and Ultimate Limite States, ULS). In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Existing guidelines: TensiNet Design guide is used as a first reference	
Justification for inclusion in Phase 1:		Many countries of the European Community are involved in drawing up guidelines for the design and verification of Membrane Structures. It is extremely important to harmonize the efforts and produce a document which takes into account the different experiences. The document will contribute to promote a broader market for this kind of structures and ensure an adequate reliability of them. The broad interest in the development of an European-wide harmonized and acknowledged coherent set of technical rules for the design of Membrane Structures is demonstrated by the EU project funded by the European Commission (TensiNet), in which 22 participating organizations with representatives from 9 EU member states and a complementary group representing multi-disciplinary industries, universities and other associations took part.	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Preparation of Scientific and Technical Report	The Scientific and Technical Report will give an overview on the state of the art of designing Membrane Structures. Furthermore it will provide guidelines for the design Membrane Structures used in buildings and civil engineering works. This shall be done considering the particular material and the structural behaviour of Tensile Structures, in view of the latest research results. The Scientific and Technical Report will be written according to the resolution 255 of TC 250. Delivery of the report is expected by end of June 2014. JRC has agreed on publishing the report.		The benefit of this work item is to provide: - an overview on the state of the art, - the formulation of general principles and rules of application for the design and verification of Membrane Structures,	The concrete output will be a Scientific and Technical Report on the design and verification of Membrane Structures, containing all relevant information, explication and data on the latest technical-scientific level, able to be accepted by CEN/TC250. Thus it shall serve as background to the elaboration of CEN TS.	

Task Ref:	**WG5.T2**	**Task Name:**	Membrane Structures – Preparation of CEN TS
Proposed Task Phase:	**P3**	**Deliverable:**	CEN TS on Membrane Structures.
Outline Task Scope:		Conversation of Scientific and Technical Report to CEN TS. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Scientific and Technical Report of WG5.T1	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Conversation of Scientific and technical report to CEN TS.	When completed by the WG5, the technical rules and recommendations contained in the Scientific and Technical Report will be given to CEN/TC250 for agreement to publish. The published report will be exposed to some form of comment so that CEN/TC250 can discuss whether to accept the technical rule and recommendations as being suitable for progression to the next step.	Scientific and Technical Report		New CEN TS	✓ (subject to extension of mandate to include Membrane Structures)

Task Ref:	**WG6.T1**	**Task Name:**	Robustness Framework
Proposed Task Phase:	**P1**	**Deliverable:**	New and revised clauses for EN 1990, EN 1991-1-7, Framework report (JRC Technical report?) for horizontal implementation of Material related Robustness rules.
Outline Task Scope:		Development of a clear definition of robustness and proportional measures in the Eurocodes by defining a clear methodology, practical measures with respect to foreseen (normal and accidental) and unforeseen (accidental) actions in relation to the consequence class for the unambiguous implementation of robustness in the Eurocodes. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		EN 1990, EN 1991-1-7, recent results of international studies from scientific and technical associations JCSS and the outcome of the COST Transport and Urban Development (TUD) Action TU0601.	
Justification for inclusion in Phase 1:		This work is the basis for the modification of EN 1990 and EN 1991 with regard to robustness and must be carried out an finalized before horizontal harmonisation can be achieved. and counterpart clauses in the material related Eurocodes can be developed by the responsible SC's	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Robustness rules for normal and accidental actions in relation to common buildings	Development of a practical view on rules on and measures for robustness in common buildings in relation to: • the cause of damage: known and unknown • the type of loading: ordinary, earthquake or accidental • the potential for clarification and thereby simplification by avoiding the current mix of measures for terrorist attacks, gas explosions and accidental actions due to unspecified causes.	EN1990, EN 1991-1-7	Enhancement and simplification / clarification of existing rules in EN 1990 and EN 1991-1-7	Proposal for new and modified clauses in EN 1990 and EN 1991	✓

Task Ref:	**WG6.T2**	**Task Name:**	Robustness rules in material related Eurocode parts
Proposed Task Phase:	**P3**	**Deliverable:**	Horizontal harmonised model clauses to be implemented in material related Eurocodes.
Outline Task Scope:		Development of a clear definition of robustness and proportional measures in the Eurocodes by defining a clear methodology, practical measures with respect to foreseen (normal and accidental) and unforeseen (accidental) actions in relation to the consequence class for the unambiguous implementation of robustness in the Eurocodes. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.	
Starting documents:		Result of WG6.T1	

Sub-task Ref.	**Sub-task name**	**Brief description, background and reasons for the work** **(including any additional comments / notes)**	**Interdependencies** **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	**Key benefits**	**Output** **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	**Priority item for EC contract**
1	Horizontal implementation in material related Eurocodes	Implementation of new /modified rules in EN 1990 and EN 1991 ask for new/modified counterpart in the material related Eurocodes that are horizontally consistent.	Acting in horizontal mode, this work will interface with all other groups	Harmonisation	New modified clauses in material related Eurocodes (BY SC 2, 3, 4, 5, 6, 9	✓

Task Ref:	**HG-B.T1**	**Task Name:**	Bridges - consultation activities and ease of use review
Proposed Task Phase:	**P1**	**Deliverable:**	Papers containing recommendations to other SCs concerning specific technical issues relevant to bridges and revisions across the Eurocode suite that will improve 'ease of use' for bridge design
Outline Task Scope:		Consultation with HG-B National Contacts and development of recommendation to improve the ease of use of Eurocodes for bridge design, in particular relating to inconsistencies and improving navigation of routes through Eurocodes for bridge designers.	
Starting documents:		JRC report on workshop with HG-B National Contacts. Various national guidance documents. All Eurocodes relevant to bridges.	
Justification for inclusion in Phase 1:		This work needs to be undertaken in Phase 1 to enable the results to influence the work of other SCs/ PTs.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Improving ease of use of Eurocodes for bridge design	There is a need to examine opportunities to enhance the ease of use of the Eurocodes for bridge design, through improved clarity and simpler navigation between parts. Whilst improving ease of use of individual Eurocode parts in themselves is important, it is equally important to examine the overall application of the suite of Standards required in a design of structure and examine how ease of use can be enhanced. In addition several countries are developing sets of simplified rules for particular bridge types. There is enthusiasm from National Contacts to explore whether such guidance could be shared internationally, albeit that it is recognised that it may well not be appropriate to include it within the main Eurocode parts. Under this sub-task, a HG-B sponsored project team, in consultation with National Contacts, will review the steps necessary for the design of typical bridges and develop recommendations for other SCs on changes that will improve the ease of use of the Eurocodes.	This task will produce an output to be reviewed and implemented by other SCs.	The designer's experience of using the eurocodes is heavility influenced by the challenge of navigating between multiple Eurocode parts. Addressing minor inconsistencies and simplifying navigation between the Eurocode parts has the potential to significantly enhance the ease of use of the overall suite of Standards.	Report containing specific recommendations to SCs, WGs etc., on opportunities for simplification and improving ease of use with a focus on horizontal aspects relating to bridge design (i.e. links between Eurocodes rather than within each one).	✓
2	Review of specific technical issues relating to bridge design and the development of preliminary proposals for revisions to Eurocode parts.	The HG-B will undertake consultation with National Contacts and develop discussion papers and preliminary proposals for other SCs / WGs, helping to shape their work and ensure that issues of concern to users are addressed in the evolution of the Eurocodes based on their practical experience of application. Topics to be covered include: (i) Fatigue verification in bridge design (ii) Robustness requirements (iii) Action combinations in the design of cable stayed bridges (iv) Accounting for axial load effects in the design of steel-concrete composite sections (v) Integral bridges (vi) Partial prestressing and crack control requirements (vii) Footbridge vibrations (viii) Light rail and tram loading models; and combination rules for rail / light rail and highway traffic loading	This task will produce an output to be reviewed and implemented by other SCs.	This work will ensure that the practical experince of designers / countries will be taken into account in the evolution of the Eurocodes, and that there is a focus on priority items itentified by HG-B in consultation with National Contacts.	Series of papers setting out discussion points and specific recommendations for other SCs, WGs etc.,	

Task Ref:	**HG-B.T2**	**Task Name:**	Bridges – ease of use and technical consistency review
Proposed Task Phase:	**P3**	**Deliverable:**	Recommendations for other SCs / WGs on improvements / modifications required to draft new and revised Eurocode parts
Outline Task Scope:		Review of draft new and revised Eurocode parts to ensure they address the needs of bridge designers, achieve a high degree of technical consistency and ease of use.	
Starting documents:		Draft new and revised Eurocode parts.	

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Review of draft new and revised Eurocode parts with specific focus on issues of concern to bridge designers	Draft new and revised Eurocode parts will be reviewed by a team of bridge experts to ensure that technical issues of concern to bridge designers have been adequately addressed and that technical consistency is achieved across multiple Eurocode parts. Specific topics to be covered will: (i) Fatigue verification in bridge design (ii) Robustness requirements (iii) Action combinations in the design of cable stayed bridges (iv) Accounting for axial load effects in the design of steel-concrete composite sections (v) Integral bridges (vi) Impacts of climate change on environmental actions (vii) Loadings of noise barriers due to passing trains and related fatigue effects (viii) New materials (ix) Assessment of bridges	This task will respond to work delivered by other SCs / WGs	Ensure that the new Eurocode suite will meet the needs of users for technical consistency and ease of use, with a particular focus on horizontal issues that span several Eurocode parts	Recommendations for improvements to draft new and revised Eurocode parts	✓

Task Ref:	**HG-F.T1**	**Task Name:**	Harmonization of fire parts of Structural Eurocodes
Proposed Task Phase:	**P1**	**Deliverable:**	Harmonized sections 1 to 3 of the parts 1-2 of all related Eurocodes.
Outline Task Scope:	To harmonize the common parts of all fire parts of Eurocode for simplification of Eurocode, to eliminate as many as possible the NDPs relative to fire resistance design rules and to ensure the consistency between design rules developed for different materials. In drafting the new work, care will be taken to be as clear as possible, to use simple routes throughout the document, and to avoid additional and/or empirical rules for particular structure or structural-element types, all to the extent that is reasonably practical.		
Starting documents:	Existing rules of EN 1991-1-2, EN 1992-1-2, EN 1993-1-2, EN 1993-1-2, EN 1994-1-2, EN 1995-1-2, EN 1996-1-2, EN 1999-1-2, state of arts and NAs.		
Justification for inclusion in Phase 1:	This work needs to be undertaken in Phase 1 since the output can affect the work of other SCs/ PTs.		

Sub-task Ref.	Sub-task name	Brief description, background and reasons for the work **(including any additional comments / notes)**	Interdependencies **Identify known Task (sub-tasks) that must be substantially completed before this sub-task can commence.** **(Independencies within individual Tasks do not need to be identified)**	Key benefits	Output **(e.g. new Eurocode part; new or modified clauses in existing Eurocode part)**	Priority item for EC contract
1	Reduction in number of National Choices (NDPs)	Review the contents of all Countries' National Annexes and supporting documents, where they provide information needed to implement the Eurocode Part. Compare the values or choices made by all Countries in their relevant National Annex, using if possible, the JRC database of collected National values and choices. Where little or no variation exists between Countries, eliminate the NDP; where there is good consensus, but not unanimity, seek to persuade those not using that value or choice to adopt it. In cases of wide variation between Countries, seek the reasons for them and try to eliminate them so that consensus can be achieved, for example by use of international studies and research.				✓
2	Enhanced ease of use	Enhance ease of use by improving clarity, simplifying routes through the Eurocode, avoiding or removing rules of little practical use in design and avoiding additional and/or empirical rules for particular structure or structural-element types, all to the extent that it can be technically justified whilst safeguarding the core of essential technical requirements. Take into account feedback from users of the Eurocode.				✓
3	General sections of all fire parts of Eurocodes	The sections 1 to 3 of all fire parts of Eurocodes are very similar and this situation makes these codes heavier and in quite a lot of cases, some differences are observed. So it is important to decide whether these sections should be kept as they are right now or it is relevant to provide them for example only in EN1991-1-2. Under any circumstance, harmonisation editorial works are necessary to improve actual version of all fire parts of Eurocode.	-	To harmonize all these parts and if relevant to incorportae these parts only in EN1991-1-2 for all materials rather than to have them repeatively in each fire part of EN1992 to EN1999	General sections to be created, if relevant, in EN1991-1-2 and simplication of all other fire parts of Eurocode	
4	Conductivity of normal weight concrete at elevated temperatures	In actual version of EC, EN1992 and EN1994 proposed at the beginning two different curves for thermal conductivity at elevated temperatures and finally an interval of values are adopted but giving the possibility to take any specific curve within the interval in the scope of national annex (NDP). This situation has led to many curves across Europe. This work needs to combine the knowledge exchange between experts of EN1992-1-2 and EN1994-1-2, detailed analysis of existing fire tests performed on both concrete and steel and concrete composite structures and comparative numerical investigation.	-	To harmonise EN1992-1-2 and EN1994-1-2 with respect to thermal conductivity of normal weight concrete and make uniform the approaches in Europe.	EN1992-1-2 Section 3.3.3 EN1994-1-2 Clauses 3.3.2 (9) and (10)	✓
5	Strength behaviour of concrete during cooling phase	In actual version of EN1994-1-2, a specific informative annex is provided specifying the strength of concrete during its cooling phase. However, nothing is mentioned in EN1992-1-2. It is well known that concrete behaves quite differently once exposed to fire conditions. This work needs to combine the knowledge exchange between experts of EN1992-1-2 and EN1994-1-2 and detailed analysis of existing fire tests performed on concrete strength including both heating and cooling phases.	-	As the natural fire safety concept is accepted within Eurocde and is more and more widely used in practice, the fire design of EN1992-1-2 with this approach could not be safe if the cooling behaviour of concrete is not taken into account. In consequence, it is necessary to provide a safe design Eurocode for Europe. In addition, the introduction of this feature allows to be harmonised with EN1994-1-2.	New informative annex in EN1992-1-2	✓
6	Stress-strain relationships of reinforcing steel between EC2 and EC4	Some discrepancies exist between EN1992-1-2 and EN1994-1-2 with respect to stress-strain relationships of reinforcing steel and more data is needed for ductility of reinforcing steel which becomes more and more relevant in advanced calculation models in fire safety engineering.	-	To harmonise EN1992-1-2 and EN1994-1-2 with respect to the stress-strain relationships at elevated temperatures of various types of reinforcing steel in particular for their ductility as function of temperatures.	Section 3 of EN1992-1-2 and EN1994-1-2	

7	Design rules of cellular beams either in steel or in composite structures	For the time being, actions are going on to develop design rules for cellular beam for both steel and steel-concrete composite solutions. These rules are predicted to be incorporated respectively into EN1993-1-2 and EN1994-1-2. Furthermore, CEN TC127 elaborated specific testing method for fire protection of this type of beams which includes also simple design rules.	This action will be certainly linked to SC3-T6-ST6 and SC4-T2 relative to design methods of cellular beams	On the one hand, to have harmonised approaches between EN1993-1-2 and EN1994-1-2 and on the other hand, to ensure consistency between fire protection testing method under the responsibility of CEN TC127 and design rules of Eurocodes.	New informative annexes of EN1993-1-2 and EN1994-1-2	✓
8	Design rules of pre-stressed hollow core concrete slabs on flexible support	The pre-stressed hollow core concrete slabs are widely used in practice and it is observed that their fire performance could be largely affected if they are placed on flexible supports. This situation becomes more critical in fire situation due to important thermal impact on deflection of beams. Nevertheless, there is no design rule available to deal with this situation in actual Eurocode. This work needs to combine the knowledge exchange between experts of EN1992-1-2 and EN1994-1-2, detailed analysis of existing fire tests performed on pre-stressed hollow core concrete slabs on flexible supports (concrete beams and steel beams) and numerical investigation in order to establish a common design rule.	This action will be certainly linked to SC2-T2-ST1 and SC4-T5-ST2 and ST3 relative respectively to design methods of hollow core prestressed slabs and slim-floor beam simple design methods	To harmonise the approaches between EN1992-1-2 and EN1994-1-2, as the later predicts to introduce the simple design rules for slim-floor beam solutions with which the pre-stressed hollow core concrete slabs are commonly associated	New harmonised design rules for both EN1992-1-2 with respect to slabs and EN1994-1-2 relative to slim-floor beams. Particular specifications for construction details	✓
9	Membrane action of composite slab in fire situation	It is predicted to incorporate new design concept in EN 1994-1-2 based on the membrane action of composite slab for fire performance assessment of steel-concrete composite floors. The method is derived originally from concrete slab and in consequence it is necessary to have this approach in compliance with certain specifications of EN 1992-1-2. This work needs to combine the knowledge exchange between experts of EN1994-1-2 and EN1992-1-2, detailed analysis of existing fire tests performed on composite floors under membrane actions and numerical investigation in order to elaborate a design approach which meets design principles of both EN1994-1-2 and EN1992-1-2.	-	It is predicted to incorporate new design concept in EN1994-1-2 based on the membrane action of composite slab for fire performance assessment of steel-concrete composite floors. The method is derived originally from concrete slab and in consequence it is necessary to have this approach in compliance with certain specifications of EN1992-1-2.	New harmonized design rules for membrane action of composite floors in fire situation with respect to design rules of Eurocode 2 for fire resistance assessment of concrete members	✓
10	Advanced calculation method for simple thermal analysis	In actual Eurocodes, it is mentioned that any numerical calculation method is considered as advanced calculation model. However, the numerical thermal analysis is already introduced in several fire parts as simple calculation model, in particular for EN1992-1-2 and EN1994-1-2. Moreover, in some national annexes, it is stated that 2D heat transfer analysis is taken as simple calculation method.	-	To have a harmonised approach regarding the heat transfer analysis for all fire parts of Eurocodes	Additional principles will be given with respect to the definition of simple and advanced calculation models concerning heat transfer analysis	
11	Load combination factors for fire situation	Currently in EN1990, the load combination factors for imposed loads can be taken as ψ_1 or ψ_2 (NDP), this situation has led to confusing results around Europe because certain countries have taken ψ_2 recommended value) and others use as the combination factors for imposed load ψ_1 This work needs to get knowledge from all European experts from different countries, detailed analysis of the background of actual load combination recommendation and the background of the decisions of different national annexes.	-	To eliminate this NDP for fire safety design according to Eurocodes	To have only one combination factor for imposed loads in fire situation in Section 6.4.3.3 of EN1990	✓

Annex 2 – Overall structure of TC250 work programme (diagrammatic)

Existing Eurocodes

New Eurocodes

PHASE

Phase 1

Phase 2

Phase 3

Phase 4

DELIVERABLE

Revised Eurocode part

New Eurocode part

New and revised parts

SEEKING FUNDING

Funded wholly by industry

Priority items for EC contract

EC FUNDING SOUGHT

Task all funded

Task partially funded

Task unfunded

CEN CENELEC

EN 1990

Responsible: *Haig Gulvanessian*

- Phase 1: TCEN1990.T1 (2, 16)
- Phase 2: TCEN1990.T2 (5)

EN 1991

Responsible: *Nikolaos Malakatas*

- Phase 1: SC1.T1 (1, 4); SC1.T5 (1); SC1.T9 (1, 6)
- Phase 2: SC1.T2 (1, 4); SC1.T3 (2, 5); SC1.T4 (2, 5); SC1.T8 (1); SC1.T10 (2, 9); SC1.T7 (1)
- Phase 3: SC1.T6 (4)
- Phase 4: SC1.T11 (2)

EN 1992

Responsible: *Giuseppe Mancini*

- Phase 1: SC2.T1 (6, 4)
- Phase 2: SC2.T2 (1)

EN 1993

Responsible: *Ulrike Kuhlmann*

- Phase 1: SC3.T1 (3, 6); SC3.T2 (4, 7)
- Phase 2: SC3.T3 (3, 7); SC3.T4 (3, 6); SC3.T5 (2, 5); SC3.T6 (4, 6)
- Phase 3: SC3.T7 (2, 5); SC3.T8 (4, 7); SC3.T9 (3, 6)
- Phase 4: SC3.T10 (3, 6); SC3.T11 (2, 4); SC3.T12 (3, 5); SC3.T13 (1, 3)

EN 1994

Responsible: *Graham Couchman*

- Phase 1: SC4.T1 (6); SC4.T2 (2, 1); SC4.T3 (3, 1); SC4.T4 (2, 1)
- Phase 2: SC4.T5 (3, 1)
- Phase 3: SC4.T6 (1, 4); SC4.T7 (3, 1)

EN 1995

Responsible: *André Jorissen*

- Phase 1: SC5.T1 (2); SC5.T2 (1)
- Phase 2: SC5.T3 (7)
- Phase 3: SC5.T4 (9); SC5.T5 (8)
- Phase 4: SC5.T6 (2)

EN 1996

Responsible: *Rob van der Pluijm*

- Phase 1: SC6.T1 (10)
- Phase 2: SC6.T4 (1, 4)
- Phase 3: SC6.T2 (2, 2)
- Phase 4: SC6.T3 (3)

EN 1997

Responsible: *Andrew Bond*

- Phase 1: SC7.T1 (1, 4); SC7.T2 (1, 6)
- Phase 2: SC7.T3 (1, 7); SC7.T4 (1, 6); SC7.T5 (1, 4)
- Phases 3: SC7.T6 (1, 3)

EN 1998

Responsible: *Eduardo Carvalho*

- Phase 1: SC8.T1 (5); SC8.T3 (4)
- Phase 2: SC8.T2 (8); SC8.T4 (3)
- Phase 3: SC8.T5 (4); SC8.T6 (3)

EN 1999

Responsible: *Federico Mazzolani*

- Phase 1: SC9.T1 (7); SC9.T2 (1)
- Phase 2: SC9.T3 (1); SC9.T4 (1)
- Phase 3: SC9.T5 (1)

WG6

Responsible: *Rob van der Pluijm*

- Phase 1: WG6.T1 (1)
- Phase3: WG6.T2 (1)

HG-Bridges

Responsible: *Steve Denton*

- Phase 1: HGB.T1 (1, 1)
- Phase 3: HGB.T2 (1)

HG-Fire

Responsible: *Zhao Bin*

- Phase 1: HGF.T1 (4, 7)

WG2

Responsible: *Paul Lüchinger*

- Phase 1: WG2.T1 (1, 2)
- Phase 3: WG2.T2 (1)
- Phase 4: WG2.T3 (2)

WG3

Responsible: *Markus Feldmann, Ruth Kasper*

- Phase 1: WG3.T1 (1); WG3.T2 (3)
- Phase 4: WG3.T3 (3)

WG4

Responsible: *Luigi Ascione*

- Phase 1: WG4.T1 (1)
- Phase 3: WG4.T2 (1)

WG5

Responsible: *Marijke Mollaert*

- Phase 1: WG5.T1 (1)
- Phase 3: WG5.T2 (1)

Annex 3 – Outline Schedule

A3.1 Outline Schedule

An outline schedule is presented in this Annex with key interdependencies between tasks illustrated.

A3.2 Standard programmes for drafting work under Mandate M/515 EN

A summary of the stages required in the development of revised and new Eurocode parts is provided in Tables A3a, A3b and A3c for the following cases:

- A3a: New Eurocode Part
- A3b: New Eurocode Part using route starting with a Scientific and Technical Report (not a CEN deliverable). This applies to Assessment of existing structures, Glass, FRP and Membrane structures.
- A3c: Revision of an existing Eurocode Part

Table A3a - New Eurocode Part	
PT selected; done by SC unless financial conditions require open tender to be used	
Managing NSB contracts PT to produce EN in stated time and contracts coordination role to TC/SC, if a funded item.	
SC applies for preliminary WI	stage 00.60.0000
Work Item activated by TC/SC. Start of 3 year drafting period. See Note 2.	stage 10.99.0000
PT produces 1st working draft of EN for SC review	stage 20.60.0979
PT produces consolidated final version for enquiry.	
SC accepts draft as being suitable for enquiry by NSBs and sends draft to CCMC. (Note – there was an extra requirement previously for National Examination to check that Eurocodes were satisfactory for regulatory purposes).	stage 30.99.0979
Draft submitted to enquiry and National examination.	stage 40.20.0000
Enquiry closes.	stage 40.60.0000
PT reviews draft and take comments into account – new draft prEN – end of PT contracts when funded.	
SC agrees prEN technically competent for launching formal vote (end of SC coordination contract).	
FprEN submitted to CCMC for launch of FV	stage 45.99.0979
FV submitted to FV	stage 50.20.0000
Closure of FV and result	stage 50.60.0000
EN made available by CEN to NSBs (DAV)	stage 60.60.0000
Date of withdrawal – DAV plus 12 months.	

Table A3b - New Eurocode Part using route starting with a Scientific and Technical Report (S and TR). This applies to Assessment of existing structures, Glass, FRP and Membrane structures.	
Scientific and Technical Report provided to TC 250 by WG (not mandated by Commission and not a CEN deliverable – prepared with industry assistance).	
TC 250 asks NSBs for comments on S and TR.	
TC 250 considers comments made by NSBs and accepts report as a basis for drafting a Technical Specification (TS).	
PT selected; done by WG unless financial conditions require open tender to be used.	
Managing NSB contracts PT to produce TS in stated time and contracts coordination role to WG, if a funded item.	
WG applies for preliminary WI	stage 00.60.0000
Work Item activated by TC. Start of 3 year drafting period. See Note 2.	stage 10.99.0000
PT produces first draft of TS for WG review.	stage 20.60.0979
PT produces second draft of TS for WG review.	
WG accepts second draft as being suitable for TCA and submits to CCMC.	stage 30.99.0979
Submission to TCA (equivalent to FV in ENs).	stage 50.20.0000
Closure of TCA.	stage 50.60.0000
DAV of TS.	stage 60.60.0000
TS will be used as the basis for conversion into EN. TC 250 can decide when to activate the WI.	
SC applies for preliminary WI.	stage 00.60.0000
Work Item activated by TC. Start of 3 year drafting period. See Note 2.	stage 10.99.0000
PT produces 1st working draft of EN for SC review.	stage 20.60.0979
PT produces consolidated final version for enquiry.	
TC accepts draft as being suitable for enquiry by NSBs and sends draft to CCMC. (Note – there was an extra requirement previously for National Examination to check that Eurocodes were satisfactory for regulatory purposes)	stage 30.99.0979
Draft submitted to enquiry and National examination.	stage 40.20.0000
Enquiry closes.	stage 40.60.0000
PT reviews draft and take comments into account – new draft prEN – end of PT contracts when funded.	
SC agrees prEN technically competent for launching formal vote (end of SC coordination contract).	
FprEN submitted to CCMC for launch of FV.	stage 45.99.0979
FV submitted to FV.	stage 50.20.0000
Closure of FV and result.	stage 50.60.0000
EN made available by CEN to NSBs (DAV).	stage 60.60.0000
Date of withdrawal – DAV plus 12 months.	

Table A3c - Revision of an existing Eurocode Part	
TC 250 launches '5 year review' of existing part for a 6 month enquiry, 5-6 months before anticipated start of contract for revision. (Note, consider questions in standard CCMC review forms, as there would not be an option for withdrawal of an EN?).	
PT selected; done by SC unless financial conditions require open tender to be used.	
Managing NSB contracts PT to produce revised EN in stated time and contracts coordination role to TC/SC, if a funded item.	
SC applies for preliminary WI.	stage 00.60.0000
Work Item activated by TC/SC. Start of 3 year drafting period. See Note 2.	stage 10.99.0000
PT produces 1st working draft of EN for SC review	stage 20.60.0979
PT produces consolidated final version for enquiry.	
SC accepts draft as being suitable for enquiry by NSBs and sends draft to CCMC. (Note – there was an extra requirement previously for National Examination to check that Eurocodes were satisfactory for regulatory purposes)	stage 30.99.0979
Draft submitted to enquiry and National examination.	stage 40.20.0000
Enquiry closes.	stage 40.60.0000
PT reviews draft and take comments into account – new draft prEN – end of PT contracts when funded.	
TC/SC agrees prEN technically competent for launching formal vote (end of SC coordination contract).	
FprEN submitted to CCMC for launch of FV.	stage 45.99.0979
FV submitted to FV.	stage 50.20.0000
Closure of FV and result	stage 50.60.0000
EN made available by CEN to NSBs (DAV).	stage 60.60.0000
Date of withdrawal – DAV plus 12 months.	

NOTE

1 - The TC and SC can at any time during the development of the WI decide (through a formatted Decision) on a tolerance of 9 months at any stage in the process, before stage 30.99.0000. Only one tolerance is allowed during the development of any WI.

2 - Work items financed by EC/EFTA are not monitored against the above-mentioned deadlines but against the dates as stipulated in the relevant contract.

CEN/TC 250 Response to Mandate M/515 EN
'Towards a second generation of EN Eurocodes'

Outline schedule with key interdependencies illustrated

No.	Ref.	Task name
PHASE 1		
1	TCEN1990.T1	Basis of Design - Evolution of EN1990 - General
2	SC1.T1	Actions - EN 1991-1-2 (Fire)
3	SC1.T5	Actions - Climate change
4	SC1.T9	Actions - EN 1991-2 (Road and rail traffic loads)
5	SC2.T1	Concrete - New Items in EN 1992-1-1, EN 1992-2, EN 1992-3
6	SC3.T1	Steel - Design of Sections and Members according to EN 1993-1-1
7	SC3.T2	Steel - Joints and Connections according to EN 1993-1-8
8	SC4.T1	Composite - Respond to demands from industry, including needs for harmonization with EN1992 and EN1993
9	SC4.T2	Composite - Composite beams with large web openings
10	SC4.T3	Composite - Revised rules for shear connection in the presence of modern forms of profiled sheeting
11	SC4.T4	Composite - Develop new rules for composite columns (concrete filled tubes) in fire
12	SC5.T1	Timber - New items in revised Eurocode 5, part 1-1
13	SC5.T2	Timber -New Eurocode 5 Part on Timber Concrete Composites
14	SC6.T1	Masonry - Revised version of EN 1996-1-1
15	SC7.T1	Geotechnics - Harmonization and ease-of-use
16	SC7.T2	Geotechnics - Eurocode 7 Part 1: General rules
17	SC8.T1	Earthquake - Material independent sections of EN 1998-1
18	SC8.T3	Earthquake - Evolution of EN 1998-3
19	SC9.T1	Aluminium - Update and Simplification of all parts of EN 1999
20	SC9.T2	Aluminium - New types of Connection
21	WG2.T1	Assessment and Retrofitting of Existing Structures - General Rules / Actions
22	WG3.T1	Structural Glass - Preparation of Scientific and Technical Report
23	WG3.T2	Structural Glass - Preparation of CEN TS
24	WG4.T1	Fibre Reinforced Polymers - Preparation of Scientific and Technical Report
25	WG5.T1	Membrane Structures - Preparation of Scientific and Technical Report
26	WG6.T1	Robustness Framework
27	HG-B.T1	Bridges - consultation activities and ease of use review
28	HG-F.T1	Fire - Harmonization of fire parts of Structural Eurocodes
PHASE 2		
29	TCEN1990.T2	Basis of Design - Evolution of EN1990 - Bridges specific issues
30	SC1.T2	Actions - EN 1991-1-3 (Snow loads)
31	SC1.T3	Actions - EN 1991-1-4 (Wind)
32	SC1.T4	Actions - EN 1991-1-5 (Thermal actions)
33	SC1.T7	Actions - EN 1991-1-8 (Waves and Currents)
34	SC1.T8	Actions - EN 1991-1-9 (Atmospheric Icing)
35	SC1.T10	Actions - EN 1991-4 (Silos and Tanks)
36	SC2.T2	Concrete - New Items in EN 1992-1-2
37	SC3.T3	Steel - Cold-formed members and sheeting. Revised EN 1993-1-3
38	SC3.T4	Steel - Stability of Plated Structural Elements. Revised EN 1993-1-5
39	SC3.T5	Steel - Harmonisation and Extension of Rules for Shells and Similar Structures. Revised EN 1993-1-6 and EN 1993-1-7
40	SC3.T6	Steel - Fire design of Steel Structures. Revised EN 1993-1-2
41	SC4.T5	Composite - Development of rules covering shallow floor construction, and other flooring types using precast concrete elements
42	SC5.T3	Timber - Revised Eurocode 5, part 1-1
43	SC6.T4	Masonry - Revised version of EN 1996-3
44	SC7.T3	Geotechnics - Eurocode 7 Part 2: Ground investigation
45	SC7.T4	Geotechnics - Eurocode 7 Part 3: Foundations
46	SC7.T5	Geotechnics - Eurocode 7 Part 4: Retaining structures
47	SC8.T2	Earthquake - Material dependent sections of EN 1998-1
48	SC8.T4	Earthquake - Evolution of EN 1998-5
49	SC9.T3	Aluminium - Roofing
50	SC9.T4	Aluminium - Bridging
PHASE 3		
51	SC1.T6	Actions - Interdependence of climatic actions (wind, snow, thermal and atmospheric icing) and glass structure
52	SC3.T7	Steel - Stainless Steels. Revised EN 1993-1-4
53	SC3.T8	Steel - Steel Fatigue. Revised EN 1993-1-9
54	SC3.T9	Steel - Material and Fracture. Revised EN 1993-1-10
55	SC4.T6	Composite - Evolution of existing parts of EN 1995 not included in the other tasks
56	SC4.T7	Composite - Development of rules for composite frames and prestressed elements
57	SC5.T4	Timber - Revised Eurocode 5, part 1-2 (Fire)
58	SC5.T5	Timber - Revised Eurocode 5, part 1-1
59	SC6.T2	Masonry - Revised version of EN 1996-1-2
60	SC7.T6	Geotechnics - Rock mechanics and dynamic design
61	SC8.T5	Earthquake - Evolution of EN 1998-4 and EN 1998-6
62	SC8.T6	Earthquake - Evolution of existing parts of EN 1998 not included in the other tasks
63	SC9.T5	Aluminium - Facades
64	WG2.T2	Assessment and Retrofitting of Existing Structures - Concrete Structures. This task is solely coordination with SC2
65	WG4.T2	Fibre Reinforced Polymers - Preparation of CEN TS
66	WG5.T2	Membrane Structures - Preparation of CEN TS
67	WG6.T2	Robustness - Robustness rules in material related Eurocode parts
68	HG-B.T2	Bridges - Ease of use and technical consistency review
PHASE 4		
69	SC1.T11	Actions - Evolution of existing parts of EN 1991 not included in the other tasks
70	SC3.T10	Steel - Steel bridges and tension components. Revised EN 1993-2 and EN 1993-1-11
71	SC3.T11	Steel - Consolidation and rationalisation of EN 1993-3
72	SC3.T12	Steel - Harmonisation and Extension of Rules for Storage Structures. Revised EN 1993-4-1 and EN 1993-4-2
73	SC3.T13	Evolution of existing parts of EN 1993 not included in the other tasks
74	SC5.T6	Timber - Evolution of existing parts of EN 1995 not included in the other tasks
75	SC6.T3	Masonry - Revised version of EN 1996-2
76	WG2.T3	Assessment and Retrofitting of Existing Structures - General Rules / Actions. Preparation of EN
77	WG3.T3	Structural Glass - Preparation of EN