



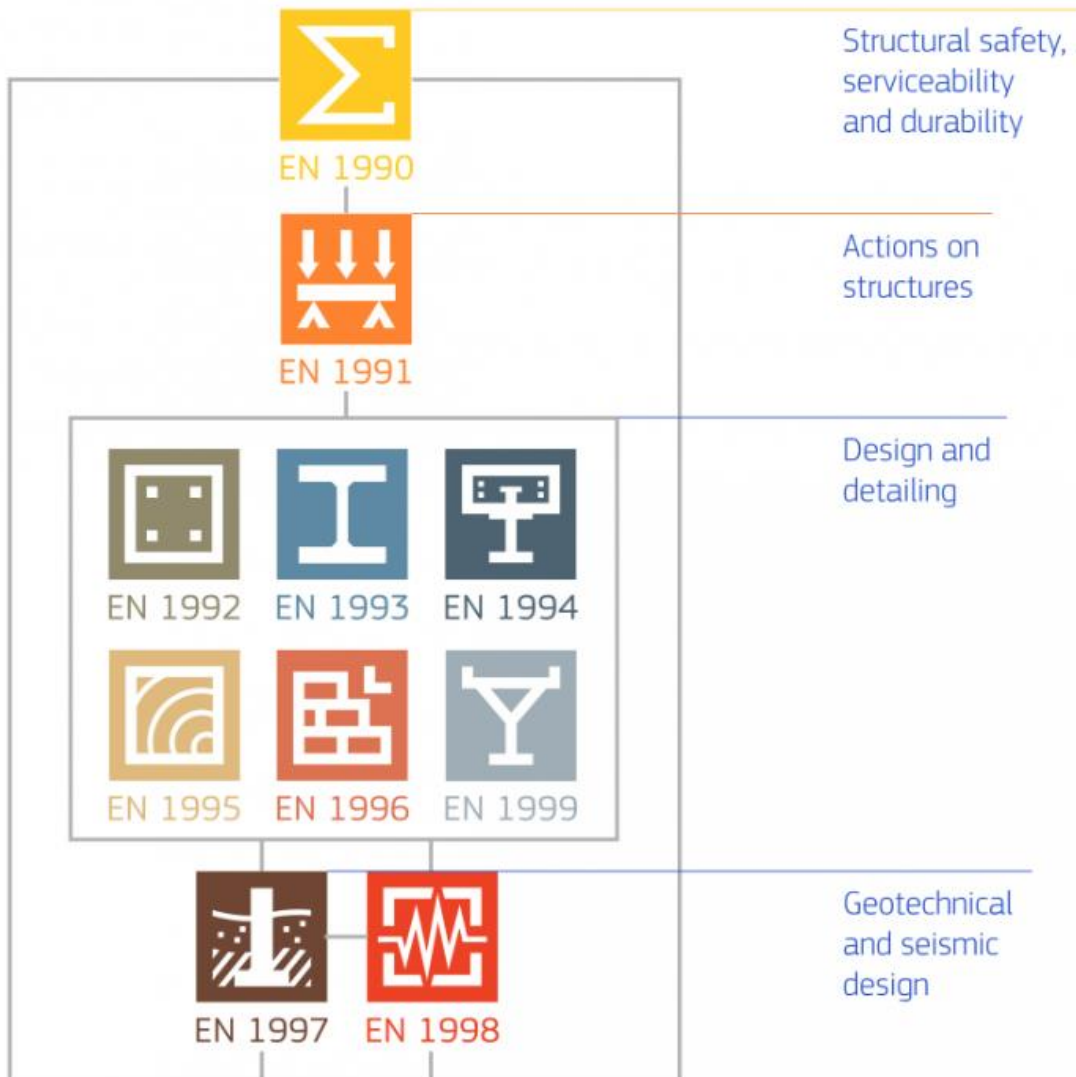
Eurocodes family

The Eurocodes suite is made up by 10 European Standards for structural design and each Eurocode covers particular technical aspects.




Links between the Eurocodes

The Eurocodes suite is made up by 10 European Standards for structural design. Each Eurocode consists of a number of parts that cover particular technical aspects. The links between the Eurocodes are given in the figure.



EN Eurocodes



EN 1990

Eurocode: Basis of structural design

EN 1990 establishes Principles and Requirements for the safety, serviceability and durability of structures, describes the basis for their design and verification and gives guidelines for related...

[Read more](#)



EN 1991

[Eurocode 1: Actions on structures](#)

EN 1991 Eurocode 1 provides comprehensive information on all actions that should normally be considered in the design of buildings and other civil engineering works, including some geotechnical...

[Read more](#)



EN 1992

[Eurocode 2: Design of concrete structures](#)

EN 1992 Eurocode 2 applies to the design of buildings and other civil engineering works in plain, reinforced and prestressed concrete. It complies with the principles and requirements for the safety...

[Read more](#)



EN 1993

[Eurocode 3: Design of steel structures](#)

EN 1993 Eurocode 3 applies to the design of buildings and other civil engineering works in steel. It complies with the principles and requirements for the safety and serviceability of structures, the...

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EN 1995

[Eurocode 5: Design of timber structures](#)

EN 1995 Eurocode 5 applies to the design of buildings and other civil engineering works in timber (solid timber, sawn, planed or in pole form, glued laminated timber or wood-based structural products)...

[Read more](#)



EN 1994

[Eurocode 4: Design of composite steel and concrete structures](#)

EN 1994 Eurocode 4 applies to the design of composite structures and members for buildings and other civil engineering works. It complies with the principles and requirements for the safety and...

[Read more](#)



EN 1996

[Eurocode 6: Design of masonry structures](#)

EN 1996 Eurocode 6 applies to the design of buildings and other civil engineering works, or parts thereof, in unreinforced, reinforced, prestressed and confined masonry. The execution is covered to...

[Read more](#)



EN 1997

[Eurocode 7: Geotechnical design](#)

EN 1997 Eurocode 7 shall be applied to the geotechnical aspects OF the design of buildings and other civil engineering works and shall be used in conjunction with EN 1990:2002 that establishes the...

[Read more](#)



EN 1998

[Eurocode 8: Design of structures for earthquake resistance](#)

EN 1998 Eurocode 8 applies to the design and construction of buildings and other civil engineering works in seismic regions. Its purpose is to ensure that in the event of earthquakes human lives are...

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EN 1999

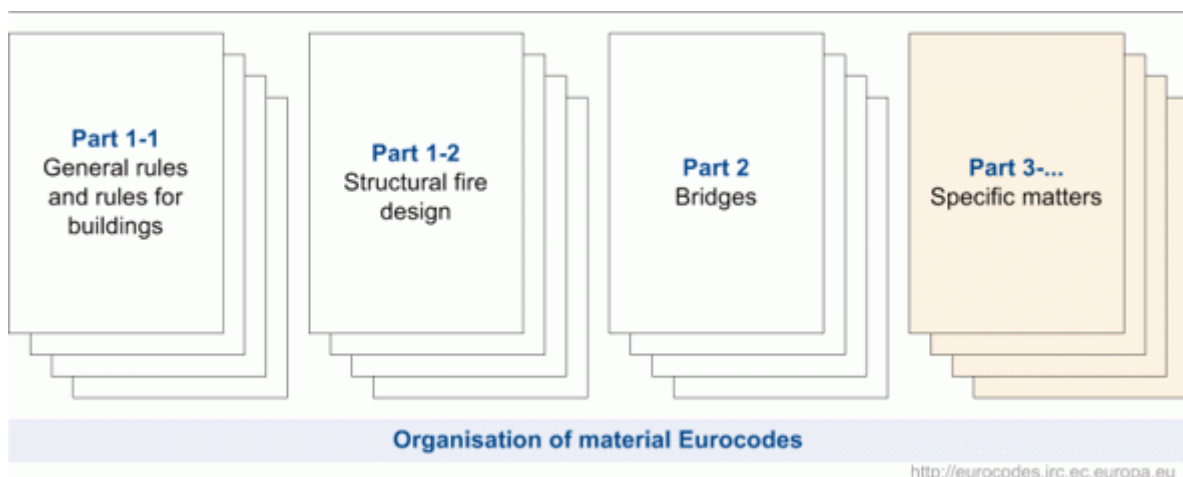
[Eurocode 9: Design of aluminium structures](#)

EN 1999 Eurocode 9 applies to the design of buildings and other civil engineering and structural works in aluminium. It complies with the principles and requirements for the safety and serviceability...

[Read more](#)

Parts

Each of the codes (except EN 1990) is divided into a number of Parts covering specific aspects of the subject. In total there are 58 EN Eurocode parts distributed in the ten Eurocodes (EN 1990 – 1999).



All of the EN Eurocodes relating to materials have a Part 1-1 which covers the design of buildings and other civil engineering structures and a Part 1-2 for fire design. The standards for concrete, steel, composite steel and concrete, and timber structures and earthquake resistance have a Part 2 covering design of bridges. The Part 2 should be used in combination with the appropriate general Parts (Parts 1).

BASIC REQUIREMENTS OF A BUILDING

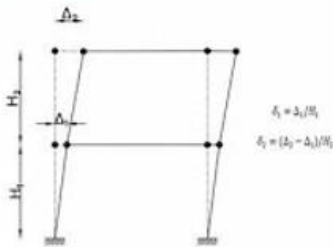
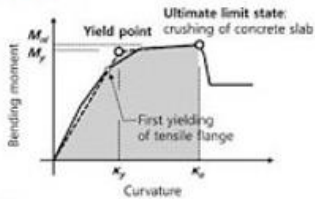


LIMIT STATE DESIGN

• ULTIMATE LIMIT STATE (ULS)



• SERVICEABILITY LIMIT STATE (SLS)



Eurocode: Basis of structural design



EN 1990 establishes Principles and Requirements for the safety, serviceability and durability of structures, describes the basis for their design and verification and gives guidelines for related aspects of structural reliability.

Parts

EN 1990:2002	Eurocode - Basis of structural design
EN 1990:2002/A1:2005	Eurocode - Basis of structural design

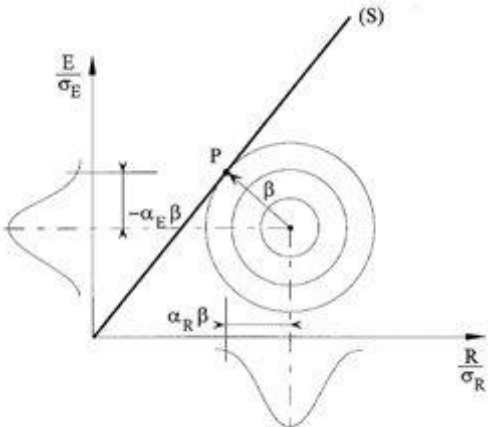
EN 1990 is intended to be used in conjunction with EN 1991 to EN 1999 for the structural design of buildings and other civil engineering works, including geotechnical aspects, structural fire design, situations involving earthquakes, execution and temporary structures. For the design of special construction works (e.g. nuclear installations, dams, etc.), other provisions than those in EN 1990 to EN 1999 might be necessary.

EN 1990 is applicable for the design of structures where other materials or other actions outside the scope of EN 1991 to EN 1999 are involved.

EN 1990 is applicable for the structural appraisal of existing construction, in developing the design of repairs and alterations or in assessing change of use.

EN 1990 may be used, when relevant, as a guidance document for the design of structures outside the scope of the EN Eurocodes EN 1991 to EN 1999, for:

- assessing other actions and their combinations;
- modelling material and structural behaviour;
- assessing numerical values of the reliability format.



(S) failure boundary $g = R - E = 0$
P design point

Eurocode 1: Actions on structures



EN 1991 Eurocode 1 provides comprehensive information on all actions that should normally be considered in the design of buildings and other civil engineering works, including some geotechnical aspects.

It is in four main parts, the first part being divided into sub-parts that cover densities, self-weight and imposed loads; actions due to fire; snow; wind; thermal actions; loads during execution and accidental actions. The remaining three parts cover traffic loads on bridges, actions by cranes and machinery and actions in silos and tanks.

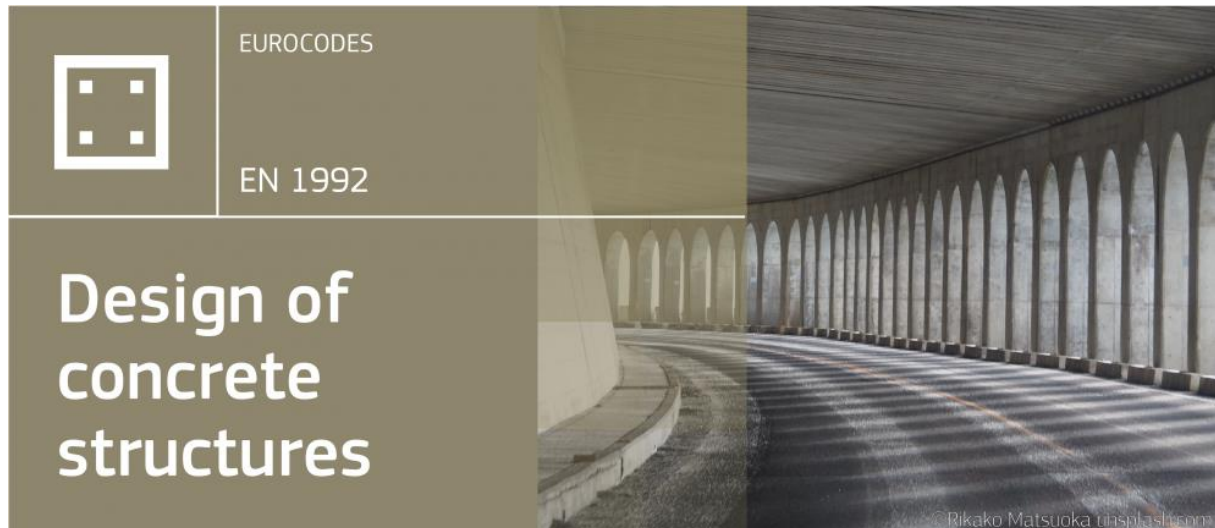
Parts

EN 1991-1-1:2002	Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings
EN 1991-1-2:2002	Eurocode 1: Actions on structures - Part 1-2: General actions - Actions on structures exposed to fire

EN 1991-1-3:2003	Eurocode 1: Actions on structures - Part 1-3: General actions - Snow loads
EN 1991-1-4:2005	Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions
EN 1991-1-5:2003	Eurocode 1: Actions on structures - Part 1-5: General actions - Thermal actions
EN 1991-1-6:2005	Eurocode 1: Actions on structures - Part 1-6: General actions - Actions during execution
EN 1991-1-7:2006	Eurocode 1: Actions on structures - Part 1-7: General actions - Accidental actions
EN 1991-2:2003	Eurocode 1: Actions on structures - Part 2: Traffic loads on bridges
EN 1991-3:2006	Eurocode 1: Actions on structures - Part 3: Actions induced by cranes and machinery
EN 1991-4:2006	Eurocode 1: Actions on structures - Part 4: Silos and tanks

EN 1991 is intended to be used in conjunction with EN 1992 to EN 1999 for the structural design of buildings and other civil engineering works.

Eurocode 2: Design of concrete structures



EN 1992 Eurocode 2 applies to the design of buildings and other civil engineering works in plain, reinforced and prestressed concrete. It complies with the principles and requirements for the safety and serviceability of structures, the basis of their design and verification that are given in EN 1990: Basis of structural design. EN Eurocode 2 is concerned with the requirements for resistance, serviceability, durability and fire resistance of concrete structures.

Parts

EN 1992-1-1:2004	Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings
EN 1992-1-2:2004	Eurocode 2: Design of concrete structures - Part 1-2: General rules - Structural fire design

EN 1992-2:2005	Eurocode 2: Design of concrete structures - Part 2: Concrete bridges - Design and detailing rules
EN 1992-3:2006	Eurocode 2: Design of concrete structures - Part 3: Liquid retaining and containment structures

Part 1.1 gives a general basis for the design of structures in plain, reinforced and prestressed concrete, while Part 1-2 deals with the design of concrete structures for the accidental situation of fire exposure. Part 2 gives a general basis for the design and detailing of bridges in reinforced and prestressed concrete. Finally, Part 3 covers additional rules for the design of concrete structures for the containment of liquids or granular solids and other liquid retaining structures.

EN Eurocode 2 is intended to be used in conjunction with:

- EN 1990: Eurocode - Basis of structural design;
- EN 1991: Eurocode 1 - Actions on structures;
- hENs, ETAGs and ETAs: Construction products relevant for concrete structures;
- ENV 13670: Execution of concrete structures;
- EN 1997: Eurocode 7 - Geotechnical design;
- EN 1998: Eurocode 8 - Design of structures for earthquake resistance, when concrete structures are built in seismic regions.

Eurocode 3: Design of steel structures



EN 1993 Eurocode 3 applies to the design of buildings and other civil engineering works in steel. It complies with the principles and requirements for the safety and serviceability of structures, the basis of their design and verification that are given in EN 1990 – Basis of structural design. EN Eurocode 3 is concerned with requirements for resistance, serviceability, durability and fire resistance of steel structures.

EN Eurocode 3 is wider in scope than most of the other design EN Eurocodes due to the diversity of steel structures, the need to cover both bolted and welded joints and the possible slenderness of construction. EN 1993 has about 20 parts covering common rules, fire design, bridges, buildings, tanks, silos, pipelines, piling, crane supported structures, towers and masts, chimneys, etc.

EN Eurocode 3 is intended to be used in conjunction with:

- EN 1990: Eurocode - Basis of structural design;
- EN 1991: Eurocode 1 - Actions on structures;
- ENs, ETAGs and ETAs for construction products relevant for steel structures;

- EN 1090: Execution of steel structures - Technical requirements;
- EN 1992 to EN 1999 when steel structures or steel components are referred to.

Parts

EN 1993-1-1:2005	Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings
EN 1993-1-2:2005	Eurocode 3: Design of steel structures - Part 1-2: General rules - Structural fire design
EN 1993-1-3:2006	Eurocode 3: Design of steel structures - Part 1-3: General rules - Supplementary rules for cold-formed members and sheeting
EN 1993-1-4:2006	Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels
EN 1993-1-5:2006	Eurocode 3: Design of steel structures - Part 1-5: General rules - Plated structural elements
EN 1993-1-6:2007	Eurocode 3: Design of steel structures - Part 1-6: Strength and stability of shell structures
EN 1993-1-7:2007	Eurocode 3: Design of steel structures - Part 1-7: Strength and stability of planar plated structures subject to out of plane loading

EN 1993-1-8:2005	Eurocode 3: Design of steel structures - Part 1-8: Design of joints
EN 1993-1-9:2005	Eurocode 3: Design of steel structures - Part 1-9: Fatigue
EN 1993-1-10:2005	Eurocode 3: Design of steel structures - Part 1-10: Material toughness and through-thickness properties
EN 1993-1-11:2006	Eurocode 3: Design of steel structures - Part 1-11: Design of structures with tension components
EN 1993-1-12:2007	Eurocode 3: Design of steel structures - Part 1-12: General - High strength steels
EN 1993-2:2006	Eurocode 3: Design of steel structures - Part 2: Steel bridges
EN 1993-3-1:2006	Eurocode 3: Design of steel structures - Part 3-1: Towers, masts and chimneys – Towers and masts
EN 1993-3-2:2006	Eurocode 3: Design of steel structures - Part 3-2: Towers, masts and chimneys – Chimneys
EN 1993-4-1:2007	Eurocode 3: Design of steel structures - Part 4-1: Silos
EN 1993-4-2:2007	Eurocode 3: Design of steel structures - Part 4-2: Tanks

EN 1993-4-3:2007	Eurocode 3: Design of steel structures - Part 4-3: Pipelines
EN 1993-5:2007	Eurocode 3: Design of steel structures - Part 5: Piling
EN 1993-6:2007	Eurocode 3: Design of steel structures - Part 6: Crane supporting structures

Eurocode 4: Design of composite steel and concrete structures



EN 1994 Eurocode 4 applies to the design of composite structures and members for buildings and other civil engineering works. It complies with the principles and requirements for the safety and serviceability of structures, the basis of their design and verification that are given in EN 1990 – Basis of structural design. EN Eurocode 4 is concerned with requirements for resistance, serviceability, durability and fire resistance of composite structures.

Parts

EN 1994-1-1:2004	Eurocode 4: Design of composite steel and concrete structures – Part 1-1: General rules and rules for buildings
EN 1994-1-2:2005	Eurocode 4: Design of composite steel and concrete structures – Part 1-2: General rules - Structural fire design

EN 1994-2:2005	Eurocode 4: Design of composite steel and concrete structures – Part 2: General rules and rules for bridges
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EN Eurocode 4 is intended to be used in conjunction with:

- EN 1990: Eurocode - Basis of structural design;
- EN 1991: Eurocode 1 - Actions on structures;
- ENs, hENs, ETAGs and ETAs for construction products relevant for composite structures;
- EN 1090: Execution of steel structures and aluminium structures;
- EN 13670: Execution of concrete structures;
- EN 1992: Eurocode 2 - Design of concrete structures;
- EN 1993: Eurocode 3 - Design of steel structures;
- EN 1997: Eurocode 7 - Geotechnical design;
- EN 1998: Eurocode 8 - Design of structures for earthquake resistance, when composite structures are built in seismic regions.

Eurocode 5: Design of timber structures



EN 1995 Eurocode 5 applies to the design of buildings and other civil engineering works in timber (solid timber, sawn, planed or in pole form, glued laminated timber or wood-based structural products) or wood-based panels jointed together with adhesives or mechanical fasteners.

Parts

EN 1995-1-1:2004	Eurocode 5: Design of timber structures - Part 1-1: General - Common rules and rules for buildings
EN 1995-1-2:2004	Eurocode 5: Design of timber structures - Part 1-2: General - Structural fire design
EN 1995-2:2004	Eurocode 5: Design of timber structures - Part 2: Bridges

EN Eurocode 5 is intended to be used in conjunction with:

- EN 1990: Eurocode - Basis of structural design;
- EN 1991: Eurocode 1 - Actions on structures;
- hENs, ETAGs and ETAs: for construction products relevant to timber structures;
- EN 1998: Eurocode 8 - Design of structures for earthquake resistance, when timber structures are built in seismic regions.

Eurocode 6: Design of masonry structures



EN 1996 Eurocode 6 applies to the design of buildings and other civil engineering works, or parts thereof, in unreinforced, reinforced, prestressed and confined masonry. The execution is covered to the extent that is necessary to indicate the quality of the construction materials and products that should be used and the standard of workmanship on site needed to comply with the assumptions made in the design rules.

Parts

EN 1996-1-1:2005	Eurocode 6: Design of masonry structures - Part 1-1: General rules for reinforced and unreinforced masonry structures
EN 1996-1-2:2005	Eurocode 6: Design of masonry structures - Part 1-2: General rules - Structural fire design

EN 1996-2:2006	Eurocode 6: Design of masonry structures - Part 2: Design considerations, selection of materials and execution of masonry
EN 1996-3:2006	Eurocode 6: Design of masonry structures - Part 3: Simplified calculation methods for unreinforced masonry structures

Eurocode 7: Geotechnical design



EN 1997 Eurocode 7 shall be applied to the geotechnical aspects OF the design of buildings and other civil engineering works and shall be used in conjunction with EN 1990:2002 that establishes the principles and requirements for safety and serviceability, describes the basis of design and verification and gives guidelines for related aspects of structural reliability

Parts

EN 1997-1:2004	Eurocode 7: Geotechnical design - Part 1: General rules
EN 1997-2:2007	Eurocode 7: Geotechnical design - Part 2: Ground investigation and testing

Numerical values of actions on buildings and other civil engineering works to be taken into account in design are provided in EN 1991 for the various types of construction, whereas actions imposed by the ground, such as

earth pressures and by ground water, shall be calculated according to the rules of EN 1997.

Separate European Standards shall be used to treat matters of execution and workmanship. In EN 1997 execution is covered to the extent that is necessary to comply with the assumptions of the design rules. EN 1997 does not cover the special requirements of seismic design. EN 1998 provides additional rules for geotechnical seismic design, which complete or adapt the rules of this Standard.

Eurocode 8: Design of structures for earthquake resistance



EN 1998 Eurocode 8 applies to the design and construction of buildings and other civil engineering works in seismic regions. Its purpose is to ensure that in the event of earthquakes

- human lives are protected;
- damage is limited;
- structures important for civil protection remain operational.

Parts

EN 1998-1:2004	Eurocode 8: Design of structures for earthquake resistance – Part 1: General rules, seismic actions and rules for buildings
EN 1998-2:2005	Eurocode 8: Design of structures for earthquake resistance – Part 2: Bridges

EN 1998-3:2005	Eurocode 8: Design of structures for earthquake resistance – Part 3: Assessment and retrofitting of buildings
EN 1998-4:2006	Eurocode 8: Design of structures for earthquake resistance – Part 4: Silos, tanks and pipelines
EN 1998-5:2004	Eurocode 8: Design of structures for earthquake resistance – Part 5: Foundations, retaining structures and geotechnical aspects
EN 1998-6:2005	Eurocode 8: Design of structures for earthquake resistance – Part 6: Towers, masts and chimneys

The random nature of the seismic events and the limited resources available to counter their effects are such as to make the attainment of these goals only partially possible and only measurable in probabilistic terms. The extent of the protection that can be provided to different categories of buildings, which is only measurable in probabilistic terms, is a matter of optimal allocation of resources and is therefore expected to vary from country to country, depending on the relative importance of the seismic risk with respect to risks of other origin and on the global economic resources.

Special structures, such as nuclear power plants, offshore structures and large dams, are beyond the scope of EN 1998. EN 1998 contains only those provisions that, in addition to the provisions of the other relevant EN Eurocodes, must be observed for the design of structures in seismic regions. It complements in this respect the other EN Eurocodes.

Eurocode 9: Design of aluminium structures



EN 1999 Eurocode 9 applies to the design of buildings and other civil engineering and structural works in aluminium. It complies with the principles and requirements for the safety and serviceability of structures, the basis of their design and verification that are given in EN 1990 – Basis of structural design. EN 1999 is concerned with requirements for resistance, serviceability, durability and fire resistance of aluminium structures.

Parts

EN 1999-1-1:2007	Eurocode 9: Design of aluminium structures - Part 1-1: General structural rules
EN 1999-1-2:2007	Eurocode 9: Design of aluminium structures - Part 1-2: Structural fire design
EN 1999-1-3:2007	Eurocode 9: Design of aluminium structures - Part 1-3: Structures susceptible to fatigue

EN 1999-1-4:2007	Eurocode 9: Design of aluminium structures - Part 1-4: Cold-formed structural sheeting
EN 1999-1-5:2007	Eurocode 9: Design of aluminium structures - Part 1-5: Shell structures

EN 1999 is intended to be used in conjunction with:

- EN 1990: Eurocode - Basis of structural design;
- EN 1991: Eurocode 1 - Actions on structures;
- European Standards for construction products relevant for aluminium structures;
- EN 1090-1 : Execution of steel structures and aluminium structures - Part 1 : General technical delivery conditions for structural steel and aluminium components;
- EN 1090-3 : Execution of steel structures and aluminium structures - Part 3 : Technical requirements for aluminium structures.

1. Statičko-seizmičko projektiranje

- Analiza i dimenzioniranje elemenata (stupovi, grede, zidovi, ploče)
- Seizmička analiza i provjera otpornosti konstrukcije
- Izračun sila, naprezanja i deformacija
- Proračun nosivosti materijala prema **HRN EN 1990 (Eurocode: Osnovna pravila)**

Vrste opterećenja:

- Stalna: težina konstrukcije, oprema
- Promjenjiva: ljudi, namještaj, promet
- Prirodna: snijeg, vjetar, temperatura
- Seizmička: potresne sile
- Kombinacije opterećenja prema **EN 1990**

2. Savjeti za oblikovanje konstrukcija

- Zidane konstrukcije: opeka, blokovi, armirano-zidane
- Betonske i prednapete konstrukcije (**EN 1992**)
- Čelične i spregnute konstrukcije (**EN 1993**)
- Drvene konstrukcije i CLT (**EN 1995**)
- Optimizacija oblika, materijala i funkcionalnosti

3. Primjena naprednih protupotresnih tehnologija

- SC sustavi (Seismic Control)
- FRP ojačanja
- PN (Prednaponi) sustavi
- Seizmički izolatori BI (Base Isolation)
- Prigušivači: TDM i MR
- Sve prema **EN 1998 – seizmičko projektiranje**

4. Armatura i planovi oplate

- Armaturni nacrti i specifikacije materijala
 - Planovi oplate prema statičkim i seizmičkim zahtjevima
 - Detalji za jednostavniju izvedbu
 - Standardi: **EN 1992-1-1, EN 1992-1-7**
-

5. Revizija, ekspertize i sanacije

- Revizija projekata i konstrukcija
 - Ekspertiza postojećih objekata i analiza oštećenja
 - Projekti ojačanja i sanacije
 - Primjena normi: **EN 1992, EN 1993, EN 1998**
 - Povećanje seizmičke otpornosti i trajnosti objekata
-

6. Zakonski okvir i standardi

- **HRN EN Eurokodovi:** EN 1990, EN 1991, EN 1992, EN 1993, EN 1995, EN 1998
 - **Zakon o gradnji** (NN 153/13, 20/17, 39/19):
 - Obvezna sukladnost projekata sa zakonskim uvjetima
 - Kontrola projektne dokumentacije i izvedbe
 - Odgovornosti projekatana i investitora
 - **Zakon o autorskom djelu** (NN 167/03, 79/07, 90/11):
 - Zaštita intelektualnog vlasništva arhitekata i projekatana
 - Projektna dokumentacija je autorsko djelo
 - Pravo autora na priznanje i zaštitu pred neovlaštenom uporabom
-
-

Eurokodovi koje je potrebno dobro poznavati

EN 1990 – Osnovna pravila i proračun

- Opći zahtjevi za sigurnost, funkcionalnost i trajnost konstrukcija
- Kombinacije opterećenja
- Temelj za sve ostale Eurokodove

EN 1991 – Opterećenja na konstrukcije

- EN 1991-1-1: Opća stalna i promjenjiva opterećenja
- EN 1991-1-3: Snijeg
- EN 1991-1-4: Vjetar
- EN 1991-1-5: Temperatura
- EN 1991-2 : Prometna opterećenja
- EN 1991-1-7: Izvanredna opterećenja (potres, udar, požar)

EN 1992 – Betonske konstrukcije

- EN 1992-1-1: Opća pravila i pravila za zgrade
- EN 1992-1-2: Otpornost na požar
- EN 1992-1-7: Provjera nosivosti i analiza oštećenja
- EN 1992-2 : Mostovi
- EN 1992-3 : Spremnici, tankovi i silosi

EN 1993 – Čelične konstrukcije

- EN 1993-1-1: Opća pravila i pravila za zgrade
- EN 1993-1-8: Spojevi i zavareni dijelovi
- EN 1993-1-10: Stabilnost konstrukcija
- EN 1993-2 : Mostovi
- EN 1993-4 : Stupovi, krovne konstrukcije i tanki elementi

EN 1994 – Spregnute konstrukcije (čelik + beton)

- EN 1994-1-1: Opća pravila i pravila za zgrade
- EN 1994-2 : Mostovi

EN 1995 – Drvene konstrukcije

- EN 1995-1-1: Opća pravila i pravila za zgrade
- EN 1995-1-2: Otpornost na požar
- EN 1995-2 : Mostovi

EN 1998 – Seizmičko projektiranje

- EN 1998-1: Opća pravila, zgrade
- EN 1998-2: Mostovi
- EN 1998-3: Procjena i ojačanja postojećih objekata
- EN 1998-4: Temeljenje i seizmička izolacija
- EN 1998-5: Specijalne konstrukcije (rezervoari, silosi)

EN 1999 – Aluminijske konstrukcije (ako se koristi aluminij)

- EN 1999-1-1: Opća pravila i pravila za zgrade

 **Savjet:** Za kompletno statičko i seizmičko projektiranje, minimalno je potrebno detaljno poznavati:

- **EN 1990, EN 1991, EN 1992, EN 1993, EN 1995, EN 1998**
- Ostale Eurokodove (EN 1994, EN 1999) po potrebi, ovisno o vrsti konstrukcije.