

2 General rules for buildings

This section contains the mandatory provisions and general recommendations for Chapter 10, Article, 5 of PBL, and Chapter 3, Articles 8 and 9 of PBF. This section also contains general recommendations for the further application of PBL and PBF.

General recommendation

Mandatory provisions and general recommendations on the design of structural components are included in Boverket's mandatory provisions and general recommendations (2011:10) on the application of European construction standards (Eurocodes), EKS.

2:1 Material and products

Materials and products used in construction shall have known properties in matters relevant to the building's capacity to meet the requirements in these mandatory provisions and general recommendations.

General recommendation

The relevant requirements are specified in Sections 3–9. The properties should be documented.

2:2 Economically reasonable working life

General recommendation

The client/owner may select materials and technical solutions, which are economically reasonable and practical to manage, as long as the legal requirements for an economically reasonable working life are met. Working life refers to the period in which a building or a structural element functions as required, with normal maintenance.

Structural elements and installations with a shorter working life than the building's intended service life should be readily accessible and easy to replace and otherwise be easy to maintain, operate and inspect.

Structural elements and installations that are not intended to be replaced during the buildings intended service life should either be durable or be able to be protected, maintained or repaired so that the requirements of these regulations are met. Expected alterations of the properties should be taken into account when selecting materials and technical solutions. When altering the buildings, these materials and technical solutions should be chosen to ensure they work with existing designs. (*BFS 2011:26*).

2:3 General information on building works

Building, demolition or ground work sites shall be arranged in such a way that entry of unauthorised people is prevented and the risk of personal injury is limited. Measures shall be taken to provide protection against the outbreak and spread of fire and against noise and dust.

If buildings or parts of buildings are in use or put into service when building or demolition work is in progress, the necessary measures shall be taken to protect the occupants and users from personal injury resulting from accidents, dangerous noise levels, pollutants in harmful concentrations or similar

If the regular escape routes cannot be used, temporary escape routes shall be provided. (*BFS 2011:26*).

General recommendation

Particular attention should be paid to measures to limit the risk of accidents to children and microbial growth, e.g. legionella

Can not an acceptable living environment with regard to noise, dust and hygienic conditions in general be offered during alterations, the possibility to arrange replacement housing should be considered.

Rules for noise from construction sites are published by Naturvårdsverket.

Rules for building and construction works relating to protection against illness and accidents and for the work environment plan are issued by Arbetsmiljöverket.

(*BFS 2011:26*).

2:31 Design and construction

General recommendation

To ensure that buildings are designed and constructed in accordance with relevant regulations, the client/owner of the building should at an early stage consider the need for the relevant competency for the respective tasks which together with the conditions for the design and construction are presented to form the basis of the inspection plan.

When calculations are used in designing they should be based on models that to a reasonable extent describe the characteristics of a structural element in relation to the appropriate action or intended use. Calculations should be carried out with input parameters corresponding to the action the structural element or system is expected to be exposed to in operation and the material characteristics the structural element is expected to exhibit during the intended service life. The analytical model should also take into account normal performance tolerances. If there is a high degree of uncertainty in an analytical model, input parameters or available measuring methods, this should be taken into account.

If the design is based on well-established solutions, it should be ensured that the conditions in the relevant case comply with the conditions for the well-established solution, or that it has been established that the consequences of divergence do not have an injurious effect on the functioning of the relevant structural element.

The design should be presented in drawings and other documents in such a way that the fulfilment of the requirements of these mandatory provisions can be verified.

Deviations from nominal values set out in design documents should not exceed applicable tolerances. Divergences should not be made from design documents nor should measures not specified in any design document be made until it has been established that the function of the structural element has not been compromised. The party responsible for the design documents should be consulted.

When altering a building, where the conditions and designs are not known in advance, it is especially important to have access to the appropriate skilled active labour when following up the execution. The skills that are needed will be determined based on the building's conditions and the nature of the measures. (*BFS 2011:26*).

2:311 Preliminary investigation for alterations to buildings

General recommendation

Alteration work should be preceded by a preliminary investigation in which both the building's cultural values and other qualities that are substandard are clarified. The preliminary investigation should be conducted early enough to ensure the results can serve as a basis for subsequent planning. The extent of the preliminary investigation should be tailored to suit the scale of the measure and the nature of the object.

When working on the frame of the building, the affects this has on the building's load-bearing capacity needs to be clarified. (*BFS 2011:26*).

2:32 Verification

General recommendation

To ensure that the finished building meets the requirements set out in the main statutes and in these mandatory provisions, the client/owner should ensure that this is verified at an early stage. Verification may be made either at the design and construction stage or in the finished building or any combination thereof. The way in which verification is to be made in the individual case is stipulated in the inspection plan.

Unless otherwise specified, the limit values for the requirements given in this Statute must not be deviated from. The uncertainty of the method should be taken into account with regard to calculation, testing and measuring.

2:321 Verification in the finished building

General recommendation

Verification in the finished building should normally be carried out by testing, measuring or inspection, depending on the property being verified. The method used as well as the results should be documented.

In order to verify that a completed alteration measure meets the requirements for care, the measure must be related to the building design before the alteration. This often requires that the design of the building has been documented before the measure is taken. (*BFS 2011:26*).

2:322 Verification at the design and construction stages

General recommendation

At the design stage it should be verified that the conditions, design methods and calculations are relevant and correctly applied, and that they are accurately recorded in the building documents.

On delivery at the building site the client/owner of the building should verify that materials and products have the required properties. At this inspection, materials and products should be

- identified,
- examined, and
- tested unless they are construction products with certified properties in accordance with Section 1:4, or that this is obviously unnecessary.

Construction products with certified properties in accordance with Section 1:4 do not require further testing or inspection of those properties included in the certification. However, for construction products with certified properties other than those type-approved or production controlled in accordance with Chapter 8, Articles 22–23 of PBL, it should be ensured that the requirements are met for the intended use.

It should be verified that work is carried out in accordance with the relevant design documents. Issues not verified at the design phase which affect the functioning of the structural elements should be verified at the construction phase.

The result of verifications carried out at the construction phase should be documented, including any divergences from the design documents and measures taken as a result of these divergences, and other information of relevance for the functioning of the finished structural element.

2:4 Ground works

If excavation, filling, piling, blasting or other ground works could affect the nearby buildings, roads and external works, underground pipes or other underground installations in a negative way the risk of damage shall be prevented. (BFS 2011:26).

General recommendation

An investigation into groundwater conditions may clarify the risk of damage due to subsidence and temporary or permanent lowering of the groundwater and the associated secondary effects such as water shortage and biodegradation. Monitoring of changes in existing levels can be achieved by balancing the persistent reference points. Chemical, physical and bacterial risks should also be investigated. (BFS 2011:26).

For blasting works in areas subject to the provisions of a detailed development plan, a blasting plan and a blasting record, adapted to the type and extent of the work are required.

General recommendation

A blasting plan should describe how blasting work is to be carried out and specify times, risks and safety measures. The plan should include a specification of the explosives used and information on drilling, charges, covering and method of covering, as well as details on cordoning, evacuation and surveillance.

Consultation with the parties concerned should be carried out regarding measures to prevent damage and on vibration measurements.

The blasting plan should be supplemented with the required site plans.

Rules on blasting works and mining works are issued by the Swedish Work Environment Authority.

2:5 Operating and maintenance instructions, etc.

2:51 General

General recommendation

Before buildings or parts of buildings are put into service, written instructions should be available specifying how and when commissioning, testing, maintenance and servicing shall be carried out, in order that the requirements for the building and its installations which result from these mandatory provisions and from the main statutes shall be met during the working life of the building. When changing existing buildings instructions may need to be supplemented or updated. The documentation shall be adapted to the use of the building and to the extent and design of the installations.

The term commissioning refers to the phase and the activities whose aim is to complete the building and to integrate it and its installations into a fully finished and functioning unit. Coordinated performance tests should be carried out to verify that installations meet all applicable requirements.

Requirements for instructions and maintenance directions for ventilation systems to be readily available are detailed in Chapter 5. Article 2 and 3 §§§ of PBF.

Requirements for fire protection documentation are contained in Section 5:12.

A plan for periodic maintenance should cover 30 years.

Rules on the maintenance of technical appliances are issued by the Swedish Work Environment Authority.

Further mandatory provisions for maintenance and documentation of certain installations are included in Boverket's mandatory provisions and general recommendations for lifts and other motorised devices (BFS 2011:12), H. (*BFS 2011:26*).

2:52 Technical fire protection installations and ventilation systems

General recommendation

Buildings or parts of buildings should not be put into service until ventilation systems and technical fire-protection installations are ready for use.

Simple, easy-to-read and permanently displayed user instructions should be available for each device or other part of the installation which is meant to be controlled, operated or cleaned by residents or other users of the building.

When an emergency stop is installed it should be marked to ensure its function is obvious. Emergency stop refers to a device which makes it possible to stop the fans in a building in case of hazardous emissions in the surroundings. The emergency stop can be placed in the stairwell in multi-dwelling blocks or in a central and easily accessible space in buildings containing non-residential premises.