Executive Order on the Publication of the Danish Building Regulations 2015 (BR15)

Pursuant to sections 2(4), 3, 4B(1), 4C, 5, 6(1) paras (a)-(d), (f), (g) and (j), 6(2) and (3), 7(1), 8(1) and (2), 9(1), 10(1), 16(14) and (15), 16A, 16B(1), 18(5), 21(1) and (3), 22(5) and (9), 28(1) and (3), 30(2), 30A and 30C of the Danish Building Act, cf. Consolidated Act No. 1185 of 14 October 2010, as most recently amended by Act No. 745 of 1 June 2015, it is provided as follows pursuant to section 31D(1):

1. This Executive Order serves to publish the Danish Building Regulations (BR15) as specified in Schedule I, and Appendices 1-7 thereto.

2.—(1) Any person in violation of the provisions of this Executive Order and the provisions of Parts 1-8 of BR15 shall be subject to a fine, cf. Schedule I.

   (2) Companies etc. (legal entities) may be held criminally liable under the provisions of Part 5 of the Danish Criminal Code for any of the violations specified in subsection (1) above.

3.—(1) This Executive Order will come into force on 1 January 2016.

   (2) Executive Order No. 810 of 28 June 2010 on Publication of the Danish Building Regulations 2010 (BR10) is repealed.

   (3) The Executive Order shall govern applications for building permits or notices submitted after the effective date of the Executive Order. If the building work does not require permission or notice, the Executive Order shall be observed for all building works that are commenced after the Executive Order has come into force.

   (4) Up to and including 30 June 2016 and irrespective of the provisions of subsections (1)-(3) above, it shall be possible to determine to apply previous provisions; see subsection (2) above, if:

   (i) the local council has received a sufficient application for a building permit for building work covered by the rules for building permits on or before 30 June 2016;

   (ii) the local council has received sufficient notice of building works covered by the rules for building notices on or before 30 June 2016; or

   (iii) the building work is commenced on or before 30 June 2016 in the case of building works not covered by the rules for building permits or notices.

The Danish Transport and Construction Agency, 14 December 2015

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/ Marie Louise Hansen

Schedule I

Danish Building Regulations 2015

PROVISION

Introduction

The Building Regulations 2015 (BR15) are divided into two columns. The column on the left (this column) contains the legal requirements, i.e. the legally binding regulations, and the column on the right contains guideline sketches and comments on the legal requirements. The Building Regulations also comprise 7 appendices. Drawings in the guidance are only to be taken as examples. In addition to the guidance set out in the column on the right, the Danish Transport and Construction Agency has drawn up guidance relating to particular areas which are regulated in the Building Regulations. Such guidance is available at the Danish Transport and Construction Agency’s website www.bygningsreglementet.dk.

See www.byggevareinfo.dk for information about current standards, construction products, CE marking, etc.

Pursuant to Articles 30 and 26 of the Treaty on the Functioning of the European Union (TFEU), the Agreement establishing the European Economic Area and Council Decision no. 95/1/EC of the EC-Turkey Association Council, all construction products legally produced and marketed in other EU member states or in Turkey; or legally produced in EFTA countries which have signed the agreement establishing the European Economic Area; and which comply with technical standards or specifications which are on a par with such Danish standards as have been included in the Building Regulations, will be deemed to comply with the provisions of these regulations and may be marketed in Denmark. The draft
technical provisions of BR15 were notified under European Parliament and Council Directive 98/34/EC (the Information Procedure Directive), as most recently amended by Directive 98/48/EC. These Building Regulations and associated supplements have been revised as diligently as possible to ensure the accuracy of the contents. However, users apply these regulations at their own risk and the Danish Transport and Construction Agency accepts no liability for erroneous decisions made on the basis of errors in or omissions.

1. Administrative provisions

1.1 General

PROVISION

(1) The Building Regulations apply to all buildings unless otherwise provided by 1.2.

GUIDANCE

(1.1(1)) The main scope of the Building Regulations is multi-storey domestic buildings and all forms of industrial, commercial and institutional buildings, including the building categories listed in section 11 of the Danish Building Act; single-family houses for permanent dwelling, either detached single-family houses or joined houses, holiday homes in designated "summer house" areas, allotment sheds, campsite cabins and garages, outbuildings and other ancillary buildings.

(2) The Building Regulations apply to the building works listed in section 2 of the Building Act.

1.2 Limitations of the scope of the Building Regulations

PROVISION

(1) The Building Regulations do not apply to:
(i) Bridges, tunnels and other structures or erections for traffic purposes built or approved by the highway, railway or other authorities or companies with statutory responsibility for the construction works, and temporary structures and installations necessary for the completion of the construction works.
(ii) Power supply pylons, ordinary masts for electrical installations, including street lighting and masts for the overhead cable systems of public electric railways.
(iii) Bus shelters etc.
(iv) Substations and roadside junction boxes for the transmission of electricity, metering and pressure regulating stations for the transmission of gas; pumping stations and booster stations for water, drainage and district heating systems; radio and signal huts and relay housings for public transport purposes with a maximum area of 30 m² and a maximum height of 3.0 m.
(v) Siren units for warning systems installed or approved by the Danish Emergency Management Agency.
(vi) Boundary walls by adjoining properties, roads or paths and not exceeding 1.8 m.

(2) Allotment sheds that are otherwise permitted and whose size and location have been provided for in a local plan, town planning by-law or registered declaration approved by a public authority are only subject to the provisions on exhaust systems and water and drainage systems set out in 8.4 and 8.5.

GUIDANCE

(1.2(1)) Such structures, erections etc. may be built and demolished without permission or notice. The Building Regulations contain no special provisions in respect of these structures, erections etc. The limitations are defined in sections 3 and 16B(1) of the Danish Building Act.

(1.2(1)(iv)) Equipment houses for electronic communications networks or services are not covered by this provision.

(1.2(1)(vi)) See the Danish Fencing Act.

(1.2(2)) Allotment sheds may be built without a building permit or notice; see the provisions of 1.6. For the development, location and extent of allotment gardens, see the Danish Planning Act and the Danish Allotments Act. The siting of an allotment shed relative to its neighbours must make allowance for the risk of the spread of fire.
Agricultural buildings are exempt from the provisions of Parts 2, 3, 4, 5, 7 and 8 with the exception of the provisions on:
- Height and clearance set out in 2.3.3 and 2.3.4
- Building rights set out in 2.2.
- Execution and design of building structures in 4.1 and 4.2
- Fire safety in 5.1, escape routes in 5.2, structural factors in 5.3
  (apply only to livestock housing), fire safety systems in 5.4 (apply
  only to livestock housing), spread of fire and smoke in 5.5, and 5.6
  facilitating the work of the emergency services
- Water and drainage systems in 8.4 and combustion plants and
  exhaust systems in 8.5.

The provisions of Parts 2-8 may be relaxed in relation to listed buildings and buildings which form part of a scheduled ancient monument where such provisions are deemed to be in conflict with the protection and preservation value of the site.

Masts and antenna systems, comprising antennas and associated technical equipment including cables, fixings, amplifiers, filters, equipment houses/housings/cabinets, electrical earthing and microlinks for transmission lines which are used for railway communications are exempt from the provisions of Parts 1 and 2.

Transportable structures erected and used for the performance of building work for which a building permit has been granted are only covered by the provisions of 4.6. The provisions apply to transportable structures placed on building sites or nearby when the use of the structure is directly connected to building work in progress. Transportable structures which are erected or used for any purpose other than the actual performance of the building work, including structures involving the performance of drawing office work, office work or any other work that is not actual building work, and which are used as a permanent place of work, are covered by the provisions of 4.6, 5 and 7.3.1(2). The provision does not apply to storage areas and the like which serve two or more building sites simultaneously. Structures used for overnight accommodation are not covered by the provision. Tents used for other than covering scaffolding etc. are not covered by the provision.

The provision was introduced since by far the majority of transportable structures for use in building works have been covered by both the Building Regulations and the Danish Working Environment Authority's Executive Order on Building and Construction Work, in particular sections 10, 12, 17 and 21. The provision therefore means that the area will no longer be subject to double regulation. The structures that are not covered by the provisions of the Danish Working Environment Authority remain covered by the provisions of the Building Regulations.

The provision means that transportable structures used for the performance of building works are covered by few of the provisions of the Building Regulations and, for example, not covered by the requirement of building application processing.

It is generally the responsibility of the building owner to ensure that the structures meet the requirements of building legislation, see section 17(1) of the Danish Building Act. The building owner is the person who owns the plot of land on which the building work is performed.

In accordance with the provision of the Danish Building Act, however, responsibility may also rest with the user. The provision means that all transportable structures, for example cranes, scaffolding, sheds and welfare provisions for use during working hours as well as structures for use
by the site management that are solely used occasionally, are excluded from the scope of the Building Regulations as these are covered by the Danish Working Environment Authority's Executive Order on Building and Construction Work. Structures in which work is performed that is not actual building work, however, must also meet the requirements of Part 5 and Appendix 6 of the Building Regulations, see the provision of 7.3.1(2). Structures that are used for occupation by people outside working hours, for example sheds used for overnight accommodation, are not covered by the provision. These structures are therefore subject to building application processing. The provision does not exempt the transportable structures from complying with requirements under other legislation. For example, the requirement of a rural zone permit may exist regardless of whether the structure is covered by the Building Regulations or not.

1.3 Application for a building permit

PROVISION

(1) Unless otherwise provided in 1.3.5, 1.5 or 1.6, building work must not commence without the permission of the local council. 1.6.

(2) Application for a building permit must be submitted to the local council by using the digital solution (digital self-service) provided by the local authority.

(3) The application is signed by the owner using digital signature. In the absence of the owner's signature, other means of validating the applicant's right to carry out the work must be produced.

GUIDANCE

(1.3(1)) A client erecting a new building primarily intended for residential purposes must take out building damage insurance for building damage arising out of circumstances in connection with the erection of the building, see section 25A(1) of the Danish Building Act. When processing an application for a building permit the local council must ensure that the requisite documentation is in place showing that an insurance company has agreed to provide a building damage insurance; see section 25C(1) of the Danish Building Act. Under section 16(12) of the Danish Building Act, the local council may use partial permits to allow construction to commence before all matters relating to the building project have been definitively clarified. This allows the local council to ensure, for example, that any necessary structural calculations and drawings for the next phase are available before the individual partial permit is issued. A building permit is required for the erection of balconies; the provisions of 1.3.1, 1.3.2 and 1.3.3 therefore apply.

(1.3(2)) The rules on transition to mandatory digital self-service were introduced under the Danish Building Act by Act No. 552 of 2 June 2014 and are stipulated in section 16(3)-(6) of the Danish Building Act. A digital application is deemed to have been received when it is available to the local authority. The local authority must allow the application to be submitted in a different manner where special circumstances warrant that the applicant cannot be expected to be able to use digital self-service. The local authority may refrain from rejecting an application that has not been received digitally if, from an overall financial assessment, there are clear advantages of receiving the application in another manner than through the local authority's digital solution.

(1.3(3)) An application for a building permit must generally be signed by the building owner. However, the building owner may also let others submit the application by proxy or by other means validate that they are entitled to carry out the work. It is assumed that the digital systems provided by the local authority for application etc. are designed so that the local authority can identify the person who has submitted the application. Under special circumstances, the local
authority's digital self-service system may not be designed to handle a specific situation, and the applicant therefore has to verify his right to carry out the work in another manner. For instance, where two signatures are required or where the owner wants to give proxy to another and the self-service solution is not designed to handle this. Safe identification of the owner is required in the form of the required digital signature such as NemID or a digital signature with a safety level corresponding to the OCES standard or higher and which is technically compatible with OCES.

To acquire the public digital signature NemID, you must be over the age of 15, have a civil registration number and this must be verified by the Central Population Register.

(4) If the provisions of 1.3.1, 1.3.2 or 1.5(5) apply to a building, this must be made clear in the application.

(1.3(4)) The local authority makes the final evaluation of whether the building is covered by either 1.3.1, 1.3.2 or 1.5(5). If the local council decides that the building is not so covered, it must inform the applicant accordingly within two weeks.

(1.3(5)) The owner and user may be the same physical or legal entity. User means the physical or legal entity who will actually be using the structure or for whose purpose the structure will be used.

1.3.1 Particular provisions relating to ancillary buildings and detached single-family houses etc.

PROVISION

(1) In the case of the following buildings, applications need only be made to the local council if the provisions of Part 2 apply:

(i) Single-storey garages at ground level, garages in basements in single-family houses, including any conversions or extensions, when the total area of the building exceeds 50 m².

(ii) Carports, outbuildings, greenhouses and similar ancillary buildings, including any conversions or extensions thereto, when the total area of the building exceeds 50 m².

(iii) Detached single-family houses and any conversions or extensions. The provision also applies even if part of the dwelling is used for the type of commercial activity which is often based in the home.

(iv) Linked single-family houses with vertical party walls incorporating no more than two dwellings, including any extensions. The provision also applies even if part of the dwelling is

GUIDANCE

(1.3.1(i)) These structures are considered to be buildings of limited complexity and as such may be exempt from the technical provisions generally applied by the local council, see section 16(7)-(9) of the Danish Building Act. Accordingly, the applicant should therefore not submit an application covered by Parts 3-8. Buildings of limited complexity must still observe current legislation.

If, when considering the provisions of Part 2, the local council authorises the erection of a building, the location of which will necessitate specific fire safety requirements, the local council may impose such requirements even in the absence of application documentation in respect of the provisions of Part 5. In such cases the local council may demand any application documentation which is necessary to be able to process the application. This might be documentation demonstrating that external walls etc. have been provided with fire protection.

In the event of modifications to the design which mean or may mean that the structure is no longer covered by 1.3.1(1), the applicant must notify the local council accordingly. The local council will then assess whether the building is still covered by 1.3.1(1). If the local council finds that the building is no longer covered by 1.3.1(1), the structure must be considered under 1.3.3.

(1.3.1(1)(i) and (ii))

The provisions apply regardless of the type of building in connection with which the structures are established.

(1.3.1(1)(iii)-(v)) In the case of these buildings, conversion work can be carried out without a building permit or notice provided that there is no extension of the floor area or significant change of use; see 1.6(1).

Commercial activity which is often based in the home, includes hairdressing; offices of such professionals as
used for the type of commercial activity which is often based in the home.

(v) Holiday homes and any extensions.

(2) The application must provide a clear description of the work to be carried out and must be accompanied by the relevant drawings, stating the scale used. The application must include all the information required by the local council when considering the provisions of Part 2.

Depending on the nature of the building work, information and drawings such as the following may be relevant: Drawings showing the total extent of the building, sufficiently detailed to allow an assessment to be made of the total impact of the building on the surroundings, details of the size of the plot, the floor area of the building, its heights and separation distances, the location of buildings on adjacent or neighbouring plots, current and future levels of the plot and those of adjacent or neighbouring plots, calculation of the plot ratio. The drawings must only provide such information as is required by the local council for its consideration of the provisions of Part 2.

If compliance with the provisions of Parts 3-8 has implications for aspects which are covered by Part 2, the applicant must provide the local council with the relevant information (together with the application for a building permit). This may be, for example, the location of external ventilation systems which affect the external appearance of the building.

The local council may demand any information and drawings which may be necessary for a building permit to be granted in accordance with Part 2. If warranted by other legislation, the local council may require supplementary information relating to the application. This may be information about choice of materials, colours, etc., to be taken into consideration in relation to local planning provisions.

Information and drawings must generally be submitted electronically via the local authority's digital solution. If the information and drawings cannot be submitted digitally without changing their nature or rendering them useless in respect of the building project, they may be submitted by letter to the local authority.

(3) The application must include:

(i) Any information necessary for the identification of the property, building or unit.

(ii) Information on the proposed use of the building and, in the case of conversions and changes of use, information on the current use.

(iii) Information required for entering the project in the Building and Housing Register (BBR).

(iv) Information about whether the project is in violation of any provisions of the Danish Building Act, the Building Regulations, easements or covenants and other building guidelines, accompanied by a substantiated application for any necessary exemptions or permissions.

(4) If deemed necessary in individual cases, the local council may demand certification by a surveyor, in the City of Copenhagen and Frederiksberg Local Authority by the Danish Geodata Agency, of the reported size of the plot or the setting-out of the building.

1.3.2 Specific provisions relating to linked single-family houses, agricultural buildings and certain industrial and warehouse buildings

Information will typically be the title number, address, property number, floor, side/door number.

In addition to permission under the Danish Building Act, the permission of the local council is required under section 40 of the Danish Planning Act for reclassifying the use of holiday homes in designated "summer house" areas into permanent dwellings.

See the Executive Order on Updating of the Building and Housing Register (BBR), requiring the owner to provide all information which is relevant to the operation and updating of the BBR in connection with the application for a building permit.

If exemption is sought from the provisions of Parts 3-8, the application must be accompanied by such information as the local council requires for processing the application.
(1) In the case of the following buildings, applications need only be made to the local council if the provisions of Parts 2 and 5 apply.

(i) Linked single-family houses incorporating more than two dwellings with vertical party walls. The provision also applies even if part of the dwelling is used for the type of commercial activity which is often based in the home.

(ii) Single-storey agricultural buildings which may be assigned to consequence class CC1 or CC2 in DS/EN 1990 DK NA. However, this provision does not apply to agricultural buildings, where failure would seriously endanger the lives of livestock, meaning structures corresponding to buildings which would be assigned to consequence class CC3 if they were designed for human occupation.

(iii) Single-storey industrial and warehouse buildings which may be assigned to consequence class CC1 or CC2 in DS/EN 1990 DK NA.

(2) The application must provide a clear description of the work to be carried out and must be accompanied by the relevant drawings, stating the scale used. The application must include all the information required by the local council when considering the provisions of Parts 2 and 5.

(1.3.2(1)) These structures/erections are considered to be buildings of limited complexity and as such may be exempt from the technical provisions generally applied by the local council, with the exception of the provisions of Part 5; see section 16(7)-(9) of the Danish Building Act.

Buildings of limited complexity must still observe current legislation.

In the event of modifications to the design which mean or may mean that the structure is no longer covered by 1.3.1(1), the applicant must notify the local council accordingly. The local council will then assess whether the building is still covered by 1.3.1(1). If the local council finds that the building is no longer covered by 1.3.1(1), the structure must be considered under 1.3.3.

(i) For these buildings, conversion work can be carried out without a building permit or notice provided that there is no extension of the floor area or significant change of use; see 1.6.

Commercial activity which is often based in the home, includes hairdressing; offices of such professionals as estate agents, lawyers, accountants and architects; and childminding etc.

(ii) This provision does not apply to agricultural buildings which occupy two storeys or more or which have been assigned to consequence class CC3 in DS/EN 1990 DK NA. Nor does it apply to agricultural buildings, where failure would seriously endanger the lives of livestock, meaning agricultural buildings which would be assigned to consequence class CC3 if they were designed for human occupation. This would typically be livestock housing of more than 2,000 m2, where evacuation of all the animals in the building in the event of failure would be difficult. Accordingly, applications relating to buildings assigned to consequence class CC3 are always subject to the technical provisions of these regulations.

(iii) This provision does not apply to industrial and warehouse buildings which occupy two storeys or more or which have been assigned to consequence class CC3 in DS/EN 1990 DK NA and which have central heating boilers etc. with an effective rated output of more than 400 kW. When assessing whether a building is covered by 1.3.2(1)(iii), the local council must base its assessment on the building as a whole. This means that a building, the primary function of which is to serve as an industrial or warehouse facility, will be subject to this provision even if it incorporates office premises. The local council must treat the building as a single unit.

(1.3.2(2)) Depending on the nature of the building work, information and drawings such as the following may be relevant:

- Drawings showing the total extent of the building, sufficiently detailed to allow an assessment to be made of the total impact of the building on the surroundings, details of the size of the plot, the floor area of the building, its heights and separation distances, the location of buildings on adjacent or neighbouring plots, current and future levels of the plot and those of adjacent or neighbouring plots, calculation of the plot ratio.
- Information on materials and structures which will have implications affecting compliance with the provisions of Part 5.

If compliance with the provisions of Parts 3-4 and Parts 6-8 has implications for aspects which are covered in Part 2, the applicant must provide the local council with the
relevant information together with the application for a building permit. The local council may demand any information and drawings which may be necessary for a building permit to be considered in accordance with Parts 2 and 5. Information and drawings must generally be submitted electronically via the local authority's digital solution. If the information and drawings cannot be submitted digitally without changing their nature or rendering them useless in respect of the building project, they may be submitted on paper.

(1.3.2(3)(i))
Information will typically be the title number, address, property number, floor, side/door number.

(1.3.2(3)(iii))
See the Executive Order on Updating of the Building and Housing Register (BBR), requiring the owner to provide all information which is relevant to the operation and updating of the BBR in connection with the application for a building permit.

(1.3.2(3)(iv))
If exemption is sought for the provisions of Parts 3-4 and Parts 6-8, the application must be accompanied by such information as the local council requires for processing the application.

1.3.3 Other buildings

PROVISION

(1)
The application for a building permit must include a clear description of the work to be carried out and all information relevant to the processing of the application, including registration of the project with the Building and Housing Register (BBR). The application must be accompanied by the relevant drawings, stating the scale used.
appear from the digital self-service solution which documents that can or must be submitted digitally, including which documents that must be submitted in an alternative manner.

(2) The application must include:
(i) Any information necessary for the identification of the property, building or unit.
(ii) Information on any provisions of the Danish Building Act, the Building Regulations, easements or covenants and other building guidelines with which the project might be in conflict. The application must contain a substantiated application for any necessary exemptions or permissions.
(iii) Information on the proposed use of the building and, in the case of conversions and changes of use, information on the current use.
(iv) Information as to the extent to which the works have been designed under the less restrictive provisions on conversion work; see Part 3. The application must include a report on the existing building structures and other structural issues relevant to the processing of the application.
(v) Information clarifying how measures essential for responsible construction and necessitated by climatic conditions have been implemented; see 4.1(5).

(1.3.3(2)(i)) Information will typically be the title number, address, property number, floor, side/door number.

(1.3.3(2)(iv)) See 3.1(2).

(1.3.3(2)(v)) As a general rule, the required information for building work carried out in the period from 1 November to 31 March may be based on the winter bill of quantities in the Executive Order on Building and Civil Engineering Works during the Period from 1 November to 21 March.

(1.3.3(2)(vi)) See the Danish Act on the Promotion of Energy Savings in Buildings.

(1.3.3(2)(vii)) See the Executive Order on Updating of the Building and Housing Register (BBR), requiring the owner to provide all information which is relevant to the operation and updating of the BBR in connection with the application for a building permit.

(3) If deemed necessary in individual cases, the local council may require:
(i) Fire safety documentation showing the layout of the building and justifying the choice of fire safety measures.
(ii) Documentation showing how checks and maintenance of the fire safety measures and building elements will be carried out.
(iii) The local council may obtain a declaration by an expert in respect of the fire safety documentation; see 1.3.2(4)(i) and (ii). The costs are payable by the applicant.
(iv) Documentation that the building structures do not violate any provision of Part 4, Structures. The documentation must be in accordance with Appendix 4, Documentation relating to load-bearing structures.

(1.3.3(3)(i) and (ii)) Depending on the nature of the building work, the documentation should include: The overall strategy for fire safety measures, drawings and specifications showing the structural fire resistance properties of each building element, the fire safety systems, escape routes and rescue facilities etc.; fire safety calculations, documentation showing the fire resistance properties of the individual building elements and installations; and a description of how the regular checks and maintenance of all fire safety systems and building elements will be conducted.

(1.3.3(3)(iv)) The applicant appoints a construction designer for the load-bearing structures with responsibility for collating and coordinating the structural documentation. Structural documentation for secondary building structures is not covered by the requirement for a declaration to be made by a structural engineer certified under the rules set out in Appendix 3. In the case of buildings in a low documentation classification (see SBI Guidelines 223), there is normally no basis for requiring documentation demonstrating that the building structures satisfy the provisions of Part 4.
(v) Certification by a surveyor, in the City of Copenhagen and Frederiksberg Local authority by the Danish Geodata Agency, of the reported size of the plot or the setting-out of the building.

(4) In the case of buildings where failure of the load-bearing structures would seriously endanger human life or have substantial economic, social or environmental consequences, 1.3.3(3)(iv) requires that the structural documentation be accompanied by a declaration drafted and signed in person by a structural engineer who is certified under the rules set out in Appendix 3 (Certification scheme for structural engineers). The declaration must include the structural documentation in its entirety. It is for the owner to choose the structural engineer.

(5) In the case of buildings covered by 1.3.3(4) and where the consequences of any failure would be particularly serious, the certified structural engineer must have no financial association, whether direct or indirect, with the organisations which have been involved in designing the building. The owner appoints the accredited structural engineer and the appointment then requires the approval by the local council.

(6) In the case of buildings not covered by 1.3.3(4) and (5), the local council may, in special cases, require that the structural documentation in accordance with 1.3.3(3)(iv), with associated appendices, be accompanied by a declaration drafted and personally signed by a structural engineer who is certified under the rules set out in Appendix 3 (Certification scheme for structural engineers).

(7) The documentation and declarations in accordance with 1.3.3(3)-(6) must be submitted in digital form and they must be digitally signed by the person concerned, with a security level equivalent to or higher than that of the OCES signature.

1.3.4 Specific provisions relating to combined processing of applications to erect masts and antennas

PROVISION

(1) The local council may process an application for permission to erect and/or for erection of possible future antennas on that mast jointly.

(2) Joint consideration of an application to erect a mast and possible future antennas on the mast requires the application for a building permit to set out specifications of the possible future antenna structures which may later be erected on the mast. The specifications must state the number of antennas and their location.

1.3.3(4)) The building structures covered by this provision correspond to those structures which, under the National Annex to Eurocode 0, table B1 (EN 1990 DK NA National Annex to Eurocode 0: Basis of load-bearing structure design) section B4, are assigned to high consequence class CC3.

However, the requirement for a certified structural engineer's declaration does not extend to secondary building structures where failure would only affect that particular structural element and where the consequences of failure would be limited.

(1.3.3(5)) The building structures covered by this provision correspond to those structures which, under the National Annex to Eurocode 0 (EN 1990 DK NA National Annex to Eurocode 0: Basis of structural design) section B4, are assigned to high consequence class CC3 and covered by 1.3.3(4) and (5).

The certified structural engineer carries out an independent inspection of the project and provides documentary evidence of the checks in accordance with SBI Guidelines 223.

(1.3.3(6)) An example of the special cases where the local council can require that a structural declaration be appended to the structural documentation pursuant to 1.3.3(3)(iv), would be building structures which, in accordance with SBI Guidelines 223, are assigned high documentation classification.

(1.3.3(7)) The person concerned is the person who is responsible for the documentation etc., for example the surveyor or certified structural engineer.

GUIDANCE

(1.3.4(1)) The local authority will assess whether it will process the applications together.

This provision can also be applied to applications for building permits for several proposed antennas on existing masts. If the joint processing of an application for a building permit entails an obligation to conduct a consultation of parties in accordance with the provisions of the Danish Public Administration Act, such consultation must deal both with the mast and with the possible future antennas to which the application relates.

The local council's permit may stipulate that the local authority must be notified every time an antenna is erected on the mast. Antennas which are subsequently erected on the mast must comply with the building permit.

(1.3.4(2)) Any applications to erect antennas on the mast which were not included in the original application for a building permit, or to change the location specified on the original application must be processed separately.
on the mast.

(3) The building permit to erect the mast will lapse if work on erecting the mast has not started within a year of the date of the permit. However the permit to erect the authorised antennas on the mast will not lapse even if erection of the antennas is not planned until more than a year after erection of the mast.

(4) Notification must be given of completion of the building works and occupancy permit is granted as soon as the mast has been erected, without waiting for the authorised proposed antennas to be mounted on the mast. The occupancy permit is issued subject to the provisions of 1.8(2).

1.3.5 Transportable tents and structures

1.3.5.1 General

PROVISION

(1) The transportable tents and structures specified in Appendix 2, table 1, may not be erected without prior building permit from the local council.

(2) However, transportable tents and structures may be erected without a building permit from the local council if the transportable tent or the transportable structure is certified subject to the provisions of the Executive Order on Certification Scheme for Transportable Tents and Structures.

(3) Transportable tents and structures are solely comprised by the provisions of 3.2.1, 4.1-4.5 and 5 that are relevant to the specific structure.

(4) Tents and structures erected for more than six weeks on the same location, may not be erected without prior building permit from the local council, regardless of the provision of 1.3.5.1(2). In such cases, the erection is covered by Part 2. If a structure which is to be erected for more than six weeks is certified, the local authority may rely on such certification for the technical part of the building application processing. Subsequently, the local authority will only have to process any building control matters.

(1.3.4(3)) This is pursuant to section 16(13), first sentence, of the Danish Building Act. The provisions of 1.3.4(3), last sentence, only apply to such antennas as were covered by the joint building application processing.

GUIDANCE

(1.3.5.1(1)) Transportable structures must be subjected to building application processing pursuant to the provisions of 1.3.3 since such structures constitute other buildings. During the building application processing, the local authority should only ensure that the provisions of 3.2.1, 4.1-4.3 and 5 are observed. Transportable tents and structures not specified in Appendix 2, table 1 or 2, but which the local council subject to a specific assessment finds to be comprised by section 2(3) of the Danish Building Act may not be erected without prior building permit, see section 16(1) of the Danish Building Act and 1.3(1) of the Building Regulations. However, such tents and structures may be certified subject to the Executive Order on Certification Scheme for Transportable Tents and Structures, in which case a building permit is not required, see 1.3.5.1(2). The Danish Building Act does not apply to camping tents, backpacking tents, parasols and similar small objects that are not building structures and that are not made the subject of building use, since such structures are not comprised by the Danish Building Act, see section (2) of the Act. Objects of this type are therefore not comprised by the provisions of the Building Regulations.

(1.3.5.1(2)) It is also possible to have a transportable tent or a transportable structure for overnight accommodation certified.

(1.3.5.1(3)) Transportable tents and structures are solely comprised by the provisions of the clause. Accordingly, as part of the building application processing, the local authority should only ensure that these provisions are met. Tents with a total area of 50 m² and less are not covered by the provisions of Part 4, see 4.1(7). Only the provisions that are relevant for the design and use of the specific tent or specific structure must be met.

(1.3.5.1(4)) Tents and structures erected on the same location for a period exceeding six weeks, are considered to be permanent structures. Such permanent structures are subject to the requirement for building permit on a par with other fixed and permanent buildings, and may therefore not be erected subject to a certification under the Executive Order on Certification Scheme for Transportable Tents and Structures.
If the tent or structure is erected without prior knowledge that the tent or structure is to be erected on the same location for more than six weeks, the tent or structure will be covered by the requirement for building permit once the 6-week time limit has passed.

(5) The tents and structures specified in Appendix 2, table 2, can be erected without prior building permit or certification. The tents and structures specified in Appendix 2, table 2, must, however, meet the provisions of 3.2.1, 4.1-4.3 and 5 that are relevant for the specific structure.

(6) Private use as specified in Appendix 2, tables 1 and 2, means tents owned by a private person and which are solely used for private purposes by this person.

(7) A completion notice is not to be sent to the local council for structures covered by this Part and may be occupied without an occupancy permit.

1.3.5.2 Responsibilities

PROVISION

(1) Where the owner and user of a transportable structure is not the same physical or legal entity, the owner of the structure must inform the user of whether the structure has been certified.

(2) If a transportable structure is covered by the requirement for a building permit and the structure is not certified according to the provisions of Executive Order on Certification Scheme for Transportable Tents and Structures, see 1.3.5.1(2), the user of the structure must obtain such building permit from the local council before the structure is erected.

(3) The user of a transportable structure mentioned in Appendix 2, table 1, or which the local council subject to a specific assessment under section 2(3) of the Danish Building Act has deemed to be covered by the requirement for building permit, must from time to time be able to document to the building authorities that the structure has either been subject to building project processing or been certified.

(4) Responsibility for ensuring that erecting, anchoring, placing and removing a transportable structure observes a building permit granted by the local council lies with such person who has been in charge of the erection or removal of the structure.

1.4 Building permit

PROVISION

(1) Building permits must be in writing. A building permit may include a requirement to notify the local council of commencement of each new stage of the building work.

GUIDANCE

(1.3.5.1(6)) The decisive matter in respect of whether a tent is private thus rests on ownership and on the actual use of the tent. Tents for private use are thus tents where the private person owning the tent actually also uses the tent. Tents that are borrowed – regardless of whether they are borrowed against payment – are not covered by the definition of "private" since the tent is not used by the owner of the tent.

(1.3.5.2(1)) The owner and user may be the same physical and legal entity.

(1.3.5.2(4)) This entails that it is the person who has erected the structure who is also responsible for ensuring the correct and lawful erection of the structure. Accordingly, the user will be responsible for erecting the structure in cases where the user has erected the structure.

(1.4(1)) Under section 16(7) of the Danish Building Act, a building permit lapses if the building work is not commenced within one year of the date of the permit. The local council may require notification of the various stages of building works to ensure that it can carry out such inspections as it sees fit.
In the case of buildings covered by 1.3.1, the local council is only required to grant the building permit in respect of the provisions of Part 2. In the case of buildings covered by 1.3.2, the local council is only required to grant the building permit in respect of the provisions of Parts 2 and 5.

(2) The building permit may impose requirements for:

(i) taking measurements in the completed building to demonstrate compliance with the sound insulation requirements set out in Part 6, Indoor climate.

(ii) taking measurements in the completed building to demonstrate compliance with the requirements for the tightness of the building envelope of Part 7, Energy consumption. The local council is required to demand that the tightness of the building envelope is measured in at least 10% of the construction projects. For all buildings established as building class 2020, documentation of the tightness of the building envelope by testing is required. Pressure testing must be made by an impartial, qualified building tester.

(iii) documenting proper calculation verification of the observance of the energy performance framework In respect of buildings erected in building class 2020, the local council must, regardless of the provisions of 1.3.1 and 1.3.2, require documentation for properly calculated verification of the observance of the energy performance framework in at least 10% of the construction projects. Documentation must be made by an independent energy expert. Documentation must be submitted before a building permit is granted.

(iv) demanding of performance bond for the completion of enabling works pursuant to section 4 of the Danish Building Act before the building is taken into use.

(v) measurement or provision of other type of documentation by a structural damp specialist to verify compliance with the requirements of 4.1(6) in respect of the critical moisture content of structures and materials.

(vi) documentation and declarations for the load-bearing structures, see 1.3.3(3)(iv) and (4)-(6), being consistent with the finished building no later than when it is taken into use.

(vii) performing a system integration test of the fire safety systems before the building is taken into use.

(3) With the exception of 1.4(2)(ii) and (iii), the provisions of 1.4(2) do not apply to buildings covered by 1.3.1 and 1.3.2.

(4) With the exception of 1.4(2)(i), (ii) and (iii), the provisions of 1.4(2) do not apply to buildings covered by 1.3.2(1)(i).

1.5 Building notices

PROVISION

(1) The following building works may be carried out subject to a building notice being submitted to the local council:

GUIDANCE

(1.5(1)(i)-(iv)) See the Executive Order on Updating of the Building and Housing Register (BBR), requiring the owner to provide all information which is relevant to the operation and updating of the BBR in connection with the erection of such buildings.

Note that work on listed buildings which goes beyond
ordinary external and internal maintenance requires permission under the Danish Act on the Protection of Buildings.

Buildings worthy of preservation and covered by a protective town planning by-law, a local preservation plan or a registered preservation order, remain subject to the provisions thereof governing conversions, alterations, etc. The provisions of town planning by-laws and local plans on the location and layout of buildings still apply, even if the building work does not require a building permit.

(i) Garages, carports, outbuildings, greenhouses, roofed-over terraces and similar structures which are erected in connection with buildings covered by 1.3.1(1)(iii)-(v) and which, at the time of erection, conversion or extension, exceed 35 m², but do not exceed 50 m² and equipment houses for electronic communications networks or services which do not exceed 50 m² either

(ii) Garages, carports, outbuildings, greenhouses, roofed-over terraces and similar structures which are erected in connection with buildings covered by 1.3.2(1)(i) and which, at the time of erection, exceed 20 m², but do not exceed 50 m².

(iii) Garages, carports, outbuildings, greenhouses, roofed-over terraces and similar structures which are erected in connection with buildings covered by 1.3.2(1)(ii) and (iii) and 1.3.3 and which, at the time of erection, conversion or extension, do not exceed 50 m².

(iv) Wind turbines in rural zones.

(v) Satellite antennas/dishes with a diameter of more than 1.0 m.

(vi) Outdoor facilities for storage of livestock slurry, grain and animal feed and hard surface areas.

(vii) Antenna systems used for radio communication in electronic communication networks as defined in section 2 (iv) and (v) of the Danish Act on Electronic Communications Networks and Services.

(2) If the local council has not responded within two weeks of receipt of the notice, the building work may commence.

(3) The notice must be submitted to the local council by using the digital solution provided by the local authority. The local council may reject notices not submitted by digital self-service. The notice must be signed by the owner and submitted to the local council in accordance with the provisions of 1.3(2) and (3).

(4) This provision covers slurry tanks, slurry lagoons, dung yards, silage clamps, feed stores, washing areas, silos for grain, feed, etc. (1.5(1)(vi)) This provision solely concerns radio communication antennas. The Consolidated Act on Electronic Communications Networks and Services defines electronic communication networks as any type of radio frequency or cable-based telecommunications infrastructure used to provide electronic communication services. In addition, public electronic communication networks are defined as electronic communication networks made available to an undefined circle of end-users or providers of electronic communication networks or services. Examples of antenna systems in electronic communication networks comprise public mobile networks, the SINE network and related radio links. The notice provision does not relieve the antenna owner from obtaining permits required under other legislation such as rural zone permit under the Danish Planning Act.

(1.5(2)) The time limit is counted from the day the building notice is received by the local council. If, in exceptional circumstances, the building notice is received by letter, the time limit is calculated from the day when the notice is received by the local authority. If the notice is sent by post, the normal postal delivery period must be added to the time limit. In the same way, the local authority must issue any response to the building notice within two weeks of receipt of the notice, and the normal postal delivery period must again be added. The work may thus not commence before the two weeks plus the normal delivery period have elapsed.

(1.5(3)) The rules on transition to mandatory digital self-service were introduced under the Danish Building Act by Act No. 552 of 2 June 2014 and appear from section 16(3)-(6) of the Danish Building Act. A digital application is deemed to have been received when it is available to the local authority.
The building notice must include the postal or BBR address and the title number.

(5) In the case of the following buildings, building notices need only be sent to the local council if the provisions of Part 2 apply: Garages, carports, outbuildings, greenhouses and similar ancillary buildings, including extensions thereto, when the total area of the building is over 35 m² and does not exceed 50 m².

The building notice must be accompanied by drawings showing the location of the building on the site, its height, length and width, its distance from the boundary and other buildings on the site.

(6) In the case of buildings not covered by 1.5(5), the building notice must include a clear description of the work to be carried out; and drawings – with the scale marked and a specification appended – showing the location of the building on the site, its height, length and width, its distance to boundaries and other buildings on the site, and indicating the materials chosen for the external walls and roofing.

(7) In addition to the information stipulated in 1.5(6), building notices relating to wind turbines must be accompanied by any permits required by other legislation.

(8) In the case of antennas, the building notice must contain, in addition to details on the address and title number of the property, information on the location of the antenna, its height and relevant clearance factors and structural factors affecting the fixing of the antenna to the building. Indication of antenna location must follow the address system stipulated in Executive Order on Road Names and Addresses issued under the Danish Act on Building and Housing Registration. The owner of an antenna used for radio communication and comprised by the provisions of the Danish Mast Act, must together with the notice submit documentation that an agreement has been made on establishment of a mobile antenna with the building owner. The agreement must show that the parties agree on the antenna location and any antenna colouring.

(9) If the building work requires exemption from the technical provisions of Parts 3-8 of the Building Regulations, such an exemption must be applied for in the building notice, and the work may not commence before exemption is given, notwithstanding the two-week time limit.

(10) A building notice lapses if the work is not commenced within one year of the date of the permit.

(11) Building works covered by Part 1 need not be notified to the local council.

1.6 Building works exempt from a building permit or notice

PROVISION

(1) The following building works may be carried out without a building permit or notice:

GUIDANCE

(1.6(1)) Building works covered by 1.6(1)(ii) and (iii) must observe the building right stipulated in 2.2. If this is not possible, an application must be made for a building permit following the local authority's general assessment, and the building work must not be commenced until a building permit has been granted.

If the building work cannot observe the relevant provisions
(i) Conversions and other alterations to buildings as listed in 1.3.1(1), 1.3.2(1)(i) and 1.5(1)(i)-(iii). The conversion or alteration must not entail any extension of the floor area or significant changes of use.

(ii) Garages, carports, outbuildings, greenhouses, roofed-over terraces and similar structures with a maximum area of 35 m² established in connection with buildings comprised by 1.3.1(1)(iii)-(v).

(iii) Garages, carports, outbuildings, greenhouses, roofed-over terraces and similar structures established in connection with buildings comprised by 1.3.2(1)(i) of maximum 20 m².

(iv) Building works on small buildings of no more than 10 m², covered by 2.2.3.5.

(v) Building works on open-air swimming pools, garden fireplaces and terraces adjoining single-family houses and holiday homes.

(vi) Building works on campsite cabins and allotment sheds.

(vii) Drying installations for grain, seeds and other crops.

(viii) Installations with a LPG storage capacity of up to 1,200 gas storage units.

(ix) Satellite antennas with a diameter of no more than 1.0 m and CE-marked roof antennas/antennas.

(x) Structures and systems which comprise user-operated functions, such as IT points, ATMs and self-service machines and similar public-facing service functions.

(xi) Maintenance building works, conversions and other alterations to existing buildings, which will affect the energy consumption of those buildings and which are covered by section 2(1)(e) of the
Conversions and other alterations to residential units in multi-storey buildings that only affect alterations within the individual unit and which do not entail alterations to load-bearing structures. Such individual conversions or alterations must not entail any extension of the floor area.

Individual conversions and other alterations to commercial buildings that only affect a single business unit of no more than 150 m² and which do not entail alterations to load-bearing structures and escape route conditions. Such individual conversions or alterations must not entail any extension of the floor area.

Individual conversions and other alterations to traditional office buildings that only affect alterations within one or more office units, each of which forms a separate fire-resisting unit. The individual conversion or alteration must not affect escape routes used by several fire-resisting units and must not entail alterations to load-bearing structures. Such individual conversions or alterations must not entail any extension of the floor area.

and improve the energy efficiency of the building.
Maintenance comprises both maintenance of all or part of the total building and replacement of individual building components. This provision solely relates to matters affecting the energy consumption of buildings. The other provisions of section 2 of the Danish Building Act also apply if the conversion or alteration is comprised by these provisions.

The provision applies to conversions and other alterations that do not entail any extension of the floor area or a significant change of use. The conversions and alterations must still comply with the technical provisions of the Building Regulations. Conversions affecting the buildings common installations, including establishment of new bathrooms, are not covered, and a building permit is therefore required.
Changing a business unit into a residential unit or changing a residential unit into a business unit is a significant change of use and is therefore not covered by the provision, and a building permit is therefore required.

The provision applies to conversions and other alterations within the individual residential units that are converted or altered. The provision applies to, for example, alterations to non-load-bearing walls in the individual residential unit and the replacement and conversion of bathrooms, windows or kitchens.

Conversions affecting the entire building, for example the replacement of roofing with another type of roofing which thus implies an alteration to the roof structure or alterations to the escape route or ventilation system of the building, are not covered by the provision, and a building permit is therefore required. The same applies to conversions entailing alterations to exit routes from the dwelling, conversions entailing alterations to escape routes as well as the filling-in of door openings leading to stairs that serve as escape routes.

In connection with substantial conversions to residential units, a smoke alarm system connected to the power supply and using battery backup must be installed. In connection with minor conversions, it will also be appropriate to install a smoke alarm system connected to the power supply and using battery backup.

The provision applies to conversion works and alterations to a single business unit.
Conversion works to large parts of a commercial property require a building permit, and a whole commercial building therefore cannot be converted under this provision by claiming that the building project comprises separate, individual conversions.

Some changes of use of commercial buildings are subject to permission under the Danish Planning Act, and a permit for such changes must therefore be obtained from the local council.

The provision applies to traditional office buildings, which for example means office buildings erected in accordance with the guidelines set out in *Eksemplsamling om brandsikring af byggeri* [Collated examples of fire safety measures in buildings].
The provision applies to conversion works and alterations within separate fire-resisting units, for example a fire compartment or a fire section. The provision applies to, for example, the changing of cellular offices into open-plan offices and vice versa, the combination of individual offices into one fire-resisting unit, alterations to non-load-bearing walls as well as the replacement and conversion of bathrooms or kitchens.

Alterations that affect more than a single unit of the building or which affect escape route conditions are not
(2) Building works covered by Part 1 need not be notified to the local council.

1.7 Demolition of buildings

PROVISION

(1) Demolition of buildings may be carried out subject to a building notice being submitted to the local council.

GUIDANCE

(1.7(1)) Demolition of such buildings must be notified to the Building and Housing Register (BBR). The requirement for the owner's signature and the two-week time limit is described under 1.5 on building notice. Demolition of listed buildings and buildings worthy of preservation requires permission under section 11 of the Danish Act on the Protection of Buildings. In respect of demolition of buildings, see Executive Order on Building and Civil Engineering Works as amended pursuant to the Danish Working Environment Act. Moreover, see Executive Order on Asbestos and Executive Order on Waste regarding management of PCB. Local plans may include clear provisions for the preservation of existing buildings; such that a building may only be demolished with the permission of the local council.

(2) In the case of demolition, the building notice must contain, in addition to details on the address and title number of the property and building identification, information on the approximate height and surface area of the building. The local council may impose guidelines for the demolition in each individual case.

(3) The following buildings may be demolished without building permit or notice:
   (i) Garages, carports, outbuildings and similar ancillary buildings in connection with single-family houses and holiday homes.
   (ii) Buildings listed in 1.6(1)(ii)-(x).

1.8 Occupancy permit and completion notice

PROVISION

(1) On completion of any building work, a completion notice must be submitted to the local council; but see 1.3.5.1(7), 1.5(11) and 1.6(2).

GUIDANCE

(1.8(1)) See the Executive Order on Updating of the Building and Housing Register (BBR), requiring the owner to provide all information which is relevant to the operation and updating of the BBR in connection with the completion or actual occupancy of the building.

(2) Building works that require a building permit must not be taken into use without the permission of the local council.

(1.8(2)-(3)) The local council may refuse to grant an occupancy permit if the building works do not comply with the building permit, and the local council may in such cases serve notice on the owner to bring the matter into compliance; see section 17 of the Danish Building Act.
The local council may, for example, demand that the fire strategy be updated or require other documentation demonstrating that the building conforms with the requirements.

(1.8(3)) An occupancy permit is not required for building works in use where the local council’s permit does not refer to conditions in Parts 3-8 (buildings covered by 1.3.1) and Parts 3-4 and 6-8 (buildings covered by 1.3.2). In these cases, the local council only requires that it be sent a completion notice; see 1.8(1).

(1.8(4)-(5)) This requirement is derived from section 16(2) of the Danish Building Act. Applicants send in the documentation accompanied by the declaration in Appendix 5. The local council’s sole function in respect of this documentation is to archive it and it must therefore not process it in any way. The local council is only required to check that the applicant has signed the declaration in Appendix 5. It is the responsibility of the applicant to ensure that the necessary documentation has been submitted. Appendix 5 sets out examples of the documentation which may be appropriate for the building project.

In the case of buildings covered by 1.3.1, documentation must be sent to and kept by the local council demonstrating compliance with the provisions of Parts 3-8; this must be accompanied by the declaration in Appendix 5.

In the case of buildings covered by 1.3.2, documentation must be sent to and kept by the local council demonstrating compliance with the provisions of Parts 3-4 and 6-8; this must be accompanied by the declaration in Appendix 5.

The local council may give permission for buildings covered by 1.8(2) to be taken into full or partial use, even if the building work has not been fully completed. The local council may set a deadline for the completion of the building work and may require a performance bond. If the deadline is exceeded, the building may be completed on the instigation of the local council, invoking the performance bond provided.

Where permission for use involves giving the public access to a mine or similar structure, an expert’s report on the strength and stability of the subsoil must be provided. The local council may require the mine or similar structure to be monitored.

1.9 Preliminary dialogue

PROVISION

(1) Before a building permit or exemption is granted, and in the case of building notices, the local council may hold a preliminary dialogue with the owner and the owner’s representatives.

GUIDANCE

(1.9(1)) During the preliminary dialogue, the parameters of the building project will be clarified, and agreements may be made between the owner and the building authority concerning, for example, the time schedules and documentation. The preliminary dialogue may serve to clarify whether a building is covered by the provisions of 1.3.1 and 1.3.2; this matter will then have been settled before the application is submitted.

1.10 Relationship with other legislation

PROVISION

(1) Before granting a building permit and when notice has been given, the local council must investigate whether the building work conflicts with other Danish legislation, such as: The Planning Act.

GUIDANCE

(1.10(1)) The obligations of the local council extend to all other legislation which has a bearing on the processing of applications for building permits. Irrespective of 1.10(1), this obligation rests with the local council in its capacity as
The Livestock Farming Environmental Approval Act
The Nature Protection Act
The Building Listing and Preservation of Buildings Act
The Forest Act
The Environmental Protection Act
The Contaminated Soil Act
The Erection and Shared Use of Masts for Radio Communication Purposes, etc. Act
The Working Environment Act
The Public Roads Act
The Private Common Roads Act
The Slum Clearance Act
The Urban Renewal and Urban Development Act
The Heat Supply Act
The Temporary Regulation of Housing Conditions Act
The Emergency Services Act
The Museum Act
The Water Supply Act
The Urban Renewal and Urban Development Act
The Promotion of Energy Savings in Buildings Act

(2) If the building work conflicts with other legislation, the local council must, where notice has been given, respond to such notice within two weeks of receipt of the said notice.

(3) If a building permit includes requirements of other legislation, this must be stated separately in the permit.

(4) If a suitable habitat evaluation under 1.10(1) has not been conducted, the local council must, before issuing a building permit, assess whether the plan or project will have a detrimental impact on the natural habitat.

(5) A building permit may be granted irrespective of 1.10(4) if it is in the public interest to do so, given the existence of exceptional, urgent national imperatives and the absence of alternatives.

(1.10(2)) In the case of buildings covered by 1.5(5), the local council is only required to respond if there are matters relating to Part 2 which are in conflict with the provisions of other legislation.

(1.10(4)) All plans or projects which are not directly connected with or necessary for the management of an international nature reserve but which in themselves or in connection with other plans or projects which may materially affect an international nature reserve, must be evaluated in terms of their impact on the locality, taking its conservation objectives into account. This evaluation must be carried out before official permission is given. If it cannot be ruled out that the plan or project will have a detrimental impact on an international nature reserve, the authority cannot give a permit for the plan or project.

This requirement also applies to buildings outside a designated area but which might have an impact within the area.

In cases where a substantial impact cannot be ruled out, an impact assessment must be carried out to document the extent of the impact. A building permit cannot therefore be granted unless this impact assessment provides grounds for ruling out the risk of damage to the natural habitat.

For details of the procedure under the Habitat Directive see the relevant guidance issued by the Danish Energy Agency.

(1.10(5)) Such cases will be rare exceptions, where vital, urgent national consideration of the public interest can only be satisfied by waiving the broader consideration which is normally given to the administration of an international nature reserve. This exemption can not therefore be
1.11 Temporary use of an adjoining plot

**PROVISION**

(1) The local council may give an owner temporary permission to use an adjoining plot in the following circumstances:
   (i) When it is necessary to safeguard neighbouring plots, buildings, pipelines and cables in connection with foundation works, excavations or earthworks on the owner's plot.
   (ii) When it is necessary for an owner to carry out building, repair or maintenance works on the owner's own property.

(2) The adjoining plot must be used in such a way as to cause the least possible inconvenience. When the work has been completed, the person to whom the permit was granted must return the adjoining plot to its former condition as soon as possible.

(3) If new a building or alteration or removal of an existing building on a common boundary obliges the neighbour to alter or remove structures on the boundary, the neighbour must be allowed to carry out the necessary work before prevented to do so by the building work.

1.12 Fees

**PROVISION**

(1) The local council may charge for permits, temporary permissions and notices pursuant to the Building Regulations. The local council may also charge for exemptions in respect of building works that do not require a building permit or notice. Fees may also be charged even if the application is rejected or if the applicant withdraws his application for a building permit.

(2) The local council may decide not to charge any fee or only to charge fees for certain types of works.

(3) If the local council decides to charge a fee, such fee must be charged according to time spent; but see 1.12(6). The local council may decide only to charge fees for certain types of work. If the local council decides only to charge fees for certain types of work, the local council may only have expenses related to the processing granted for local or regional reasons. As an example of exceptional, urgent national consideration of the public interest can be cited the erection of wind farms. For details of the procedure under the Habitat Directive see the relevant guidance issued by the Danish Energy Agency.

**GUIDANCE**

(1.11(1))
In the case of work on roads, permission must be obtained from the highways authority.

(1.11(1)(i))
See section 12(4) of the Danish Building Act, which stipulates a two-week notice period.

(1.11(1)(ii))
Permission may be given to erect bracing, ladders, cranes, scaffolding, screening roofs etc. on adjoining plots or to provide access via an adjoining plot.

(1.12(1))
Fees are charged pursuant to section 28(1) of the Danish Building Act. Consequently, fees may be charged even if an application for a permit, temporary permission or exemption is rejected. However, it is important to distinguish between dismissal and rejection as building permit fees are only charged for rejections whereas no fees are charged in case of dismissal. A dismissal is where the local authority dismisses to consider the building project as it lacks material information. A rejection is a decision reached by the local authority following consideration of the building project but where circumstances disqualify the desired building. In cases where an applicant withdraws his application for a building permit during the process and the local authority therefore has already started the building application processing, the local authority may charge a fee for the time spent by the local authority on such processing in the period from the start of the building application processing until the withdrawal. Moreover, the local authority may charge a fee in connection with legalisation cases.

(1.12(3))
The local council may no longer charge separate fees for various building categories. Subject to an objective and professional assessment, the local council will delimit the individual project types. This may for instance take place by dividing the project types into their legal character or
of such work subject to fees covered via the fees. The local council may not cover expenses related to the building projects that are not subject to fees via the fees.

(4) The local council will determine its hourly rate. The local council must charge the same hourly rate in all building projects.

(5) In connection with the charging of building permit fees, the local council must specify the hours spent on the individual building project so that the applicant can see how the local authority calculates its time consumption.

(6) The local council may decide that the building permit fee for buildings specified in 1.3.1(1)(i) and (ii) and 1.5(1)(i)-(iii) is to be charged as a fixed fee instead of on an hourly basis. If the fee is charged as a fixed fee, it will be payable once the building works may legally be commenced. In the latter case, the local council may withhold the permit or exemption until the fee has been paid.

(7) Fees settled according to time spent are payable once the building can be legally occupied. The local council may decide that the fee is payable in two instalments. In such cases, the first instalment will be payable when the building permit or exemption is granted. The second instalment is payable when the building can be legally occupied. In connection with building notices where the fee is charged based on time spent, see 1.12(6), such fee is payable when the building works can legally be commenced.

the type of building to which the project relates. Examples of project types may be building notice projects, exemption applications, projects relating to single-family houses and storage buildings, etc. If the local council charges a fee for certain types of building projects etc., the local council must charge a fee for every type of building project in respect of the time spent by the local authority on processing the building project so that the size of the fee reflects the time spent by the local authority on processing the applicants building project. The local council may not charge a fixed "basic fee" or a "start-up fee" together with the hourly fee, unless it is covered by 1.12(6), see section 28(1), second sentence, of the Danish Building Act.

(1.12(5))

On charging building permit fees, the time consumption in the individual project must be specified so that the applicant can see how time consumption has been calculated in the individual building project and therefore will know how the local authority's time consumption has been allocated in the specific project.

(1.12(6))

This concerns ancillary buildings, such as carports, garages, outbuildings, greenhouses, etc. and their extensions. A fixed fee may be charged regardless of whether building applications for these building types must be processed or they can be built following a building notice. The local council may within the provision of 1.12(6) specify which ancillary buildings are comprised by the local authority's decision that the building permit fee is to be charged as a fixed fee. If the local council chooses to charge a fixed fee, any related earnings may not exceed the local council's total expenses for processing applications for these ancillary building types.

(1.12(7))

The due date for payment is the time when the local authority may charge a fee from the citizens at the earliest. After the due date for payment stated, the local council may determine any further payment terms, including when the fee is to be paid in the individual building project, as long as this time is not earlier than when the building can be legally occupied. This point in time will coincide with the time when the building permit can be completed, since the building cannot be legally occupied if the requisite documentation, etc. on the project is not available. If the local council decides that the building permit fee is payable in two instalments, the fee of the first instalment will cover the period from the start of the building application processing until the time when the building permit is granted. The start of the building project will be the time when the local authority either receives an application or the time when the local authority assesses that it is engaging in actual building application processing, even if it has not received a formal application. This will often be when the local authority not only observes its administrative law duty to provide guidance, but makes specific assessments and holds meetings, etc. that are based on specific building works and where the local authority's work must be considered as actual building application processing.

The second instalment will comprise the local authority's work from the time when the building permit is granted and until the building can be legally occupied. This point in time will coincide with the time when the building project can be completed, since the building cannot be legally occupied if the requisite documentation, etc. on the project...
is not available. In cases where the applicant withdraws his application for a building permit during the process, the local authority may charge a fee for the time spent by the local authority on such processing in the period from the start of the building application processing until the withdrawal. In connection with legalisation cases, a fee may be charged from the time when the local authority commences the legalisation case and until the building has been legalised.

1.13 Exemption etc.

**PROVISION**

(1) Exemption from the provisions of the Building Regulations is covered by section 22 of the Danish Building Act.

(2) If exemption is sought from the provisions of the Building Regulations for buildings covered by 1.3.1, 1.3.2 and 1.5(5), an application to this effect must be submitted to the local council.

(3) The local council may require that an application for exemption or permission to continue a breach be signed personally by the owner. This requirement will be deemed to have been met if the owner signs the application by digital signature with a security level equivalent to that of the OCES signature.

(4) Derogations from the provisions of the Danish Building Act and the Building Regulations may only be deemed to be granted if the exemption or permission is expressly stated in the building permit or otherwise notified in writing.

**1.14 Appeals**

**PROVISION**

(1) Appeals may be lodged against decisions made by the local council concerning provisions of the Building Regulations under sections 23 and 24 of the Danish Building Act. The right of appeal applies only to matters considered by the local council, see 1.3.1, 1.3.2 and 1.5(5).

**GUIDANCE**

(1.14(1)) Appeals against local council decisions may be made to the state administration under the Danish Act on Regional State Administration. The decisions of the state administration may not be appealed to any other administrative authority.

It is only possible to appeal against a decision made by a local council if the decision covers points of law, i.e. there can be no appeal against the local council's technical decisions. The time limit for an appeal is four weeks from the day the decision is notified.

The decision of the appeals authority may be brought
1.15 Sanctions

PROVISION

(1) Any person in violation the provisions of Parts 1-8 will be liable to pay a fine.

1.16 Service targets

PROVISION

(1) Each year in January, the local council must lay down and publish targets for the time the local authority spends on processing building permit applications. The local authority must as a minimum lay down one service target for the building application processing, but may lay down more.

2. Building control provisions

2.1 General

PROVISION

(1) The total footprint of the building and its impact on the surroundings are regulated in respect of:

(i) The size of the plot.
(ii) The distance of the building from boundaries to neighbouring properties, roads, paths and other buildings on the same plot.
(iii) The height of the building and number of storeys, including the height of the building in relation to boundaries to neighbouring properties, roads, paths and other buildings on the same plot.
(iv) The floor area of the building and the plot ratio.
(v) The layout of the unbuilt areas.

(2) Building control provisions must be calculated in accordance with the calculation rules set out in Appendix 1.

(3) The provisions of Part 2 do not apply if a local plan or a town planning by-law or a regulatory plan under the previous building acts provides otherwise.

GUIDANCE

(1.15(1)) Section 30(1)-(5) of the Danish Building Act sets out the penalty clauses for breach of the provisions of the Act.

(1.16(1)) The authority to lay down service targets are provided in section 21(3) of the Danish Building Act. Such service targets must specify the time spent on processing applications, which an applicant must expect in the individual local authority before obtaining a building permit. The service targets are thus to specify the time spent from the applicant has submitted and application for a building permit, which on the part of the applicant is fully documented, and until the local authority actually makes its final decision on the project. The part of the project, which the local authority as competent authority must give information about, including conduct consultation of parties and furnishing information about, which information the applicant is not required to obtain etc., is thus included in the processing time set as service target by the local authority.

In respect of any preliminary dialogue in connection with a building project, the local authority must make it clear to the applicant when the preliminary dialogue stops and the actual building permit processing begins. The local council must as a minimum lay down one service target, but may also lay down more service targets, e.g. for various building types, if the local council deems this to be expedient. The local council must publish such service targets so that applicants at all times can inform themselves of the local council's service targets.

(2.1(1)) The provision describes the conditions applicable to Part 2, both in relation to building rights set out in 2.2 and in relation to an overall assessment made in compliance with 2.3.

Building control provisions may be included as conditions in the building permit.

(2.1(3)) The provisions of the Danish Planning Act take precedence over the building control provisions of Part 2. The provisions of Part 2 are exclusively of a complementary nature in relation to buildings in a rural zone.
The calculation rules set out in Appendix 1 apply independently and cannot be amended by a local plan, town planning by-law or regulatory plan.

2.2 Building rights

PROVISION

(1) The local council cannot refuse to approve a building's floor area, number of storeys, height and separation distances as well as plot size if the conditions specified in 2.2.1, 2.2.2 and 2.2.3 are satisfied, with the limitations and extensions specified in 2.2.3.2-2.2.3.6.

GUIDANCE

(2.2.1) If a building cannot be erected in compliance with the provisions of 2.2, the total footprint of the building and its impact on the surroundings must be determined on the basis of an overall assessment under the provisions of 2.3. A permit in respect of works which are subject to building control as set out in Part 2 may be notified in the form of conditions laid down in the building permit.

2.2.1 Plot ratio

(1) The local council cannot refuse to approve the floor area of a building if the plot ratio does not exceed:
   (i) 60 in the case of multi-storey domestic buildings in an area designated for that purpose in the local plan.
   (ii) 40 in the case of wholly or partially joined single-family houses, including semi-detached houses, terraced houses, linked houses and similar dense/low-rise housing.
   (iii) 30 in the case of detached single-family houses and/or two-family houses with horizontal party walls situated in a housing estate.
   (iv) 15 in the case of holiday homes in designated "summer house" areas and
   (v) 45 in the case of other buildings.

(2.2.1(1)(v)) Other buildings mean multi-storey domestic buildings in an area not designated for multi-storey domestic buildings as well as buildings not covered by (i)-(iv).

(2) In regard to two-family houses with horizontal party walls, multi-storey buildings, commercial buildings and institutional buildings, in the case of conversions and extensions on plots in exceptional locations built before 1 February 1977, the local council may not refuse to approve a floor area up to and including 50; see 2.2.1(3).

(3) Plots in exceptional locations; see 2.2.1(2), are:
   (i) corner plots,
   (ii) roadside plots with a width of 15 m or more and
   (iii) plots with a depth of no more than 25 m measured from the plot's road-facing boundary.

2.2.2 The size of the plot

(1) In the case of parcelling out, registration or transfer of land in connection with plots for detached single-family houses and holiday homes in designated "summer house" areas, the local council may not refuse to grant approval for properties with a plot size of:
   (i) no less than 700 m² in the case of detached single-family houses and
   (ii) no less than 1,200 m² in the case of holiday homes in designated "summer house" areas; see the Planning Act.

(2.2.2(1)) In connection with plots for buildings other than detached single-family houses or holiday homes in designated "summer house" areas, land must be parcellled out, registered or transferred in accordance with the provisions of 2.3.2.

(2) When determining the size of the plot in accordance with 2.2.2(1), the area of roads and/or other land which cannot be built on because of the radius of corners or building line requirements to protect the road layout must be excluded.
2.2.3 Height and separation distances

2.2.3.1 Number of storeys and heights in general

(1) The local council may not refuse to approve the height of a building pursuant to 2.2 if the height of the building as applied for does not exceed two storeys and no part of the external walls or roof of the building is more than 8.5 m above ground level.

Height are calculated in accordance with the rules specified in Appendix 1, B. 1.1.4, and the number of storeys is calculated in accordance with Appendix 1, B. 1.1.6. The provision applies to the horizontal height-limiting plane. No part of the external walls or roof of the building may exceed 8.5 m; but see Appendix 1, B. 1.1.4(3).

2.2.3.2 Detached single-family houses, two-family houses and semi-detached houses

(1) In the case of detached single-family houses, two-family houses with horizontal party walls, the local council may not refuse to approve the height of the building or the separation distances if the conditions of (i) and (ii) below have been met.

(i) Maximum height: 1.4 x the distance from the boundary to neighbouring property and path.
(ii) Minimum distance from the boundary to neighbouring property, road and path: 2.5 m.

The building's height and separation distances are calculated according to the rules in Appendix 1, B. 1.1.4 and Appendix 1, B. 1.1.5.

This provision covers the inclined height-limiting plane. No part of the external walls or roof of the building may exceed 1.4 x the distance to the boundary to neighbouring property and path; but see Appendix 1, B. 1.1.4(3).
2.2.3.3 Holiday homes in designated "summer house" areas

(1) In the case of holiday homes in designated "summer house" areas, the local council may not refuse to approve the number of storeys, height and separation distances of a building if the conditions of (i)-(iii) below have been met.

(i) Maximum number of storeys: 1.

(ii) Maximum height: 5.0 m for a roof and 3.0 m for an external wall along at least one longitudinal side.

(2.2.3.3(1)(i))
If the existing buildings in the area are predominantly non-compliant with the provisions of 2.2.3.3(1)(i)-(iii) in respect of building height and use of roof space, new buildings may then be erected which are in keeping with the character of the area as determined by the overall assessment indicated in 2.3.

(2.2.3.3(1)(ii))
The provision applies to the horizontal height-limiting plane.
Minimum distance from the boundary to neighbouring property, road and path: 5.0 m.

Holiday homes must not be built closer than 5.0 m to a boundary to neighbouring property, road and path. The distance requirement applies equally to elevated recreation areas outside the building (more than 30 cm above natural ground level), conservatories, external staircases, balconies, chimneys, roof terraces, solar photovoltaic arrays and solar collectors and to swimming pools.

2.2.3.4 Garages, carports and similar ancillary buildings

(1) The following buildings must comply with the provisions of 2.2.3.1 and 2.2.3.2 but may be erected closer to a boundary than 2.5 m to a neighbouring property, road or path:

(i) Garages and carports.

(ii) Roofed-over terraces which are not raised above ground level.

(iii) Greenhouses, sheds and similar ancillary buildings serving as outbuildings.

(iv) Storage tanks for heating oil and similar installations which are necessary for the operation of the building.

(v) Equipment houses for electronic communications networks or services.

This provision covers buildings which serve as outbuildings, including boiler rooms and storage tanks for heating oil and similar installations which are necessary for the operation of the building, and other outbuildings which normally take the form of detached buildings. The provision only applies to garages, carports and similar ancillary buildings erected in connection with a primary building. The provision does not apply to buildings used for residential purposes, kitchens, sanitary conveniences or bathrooms.
(2) No part of the external walls or roof of the building, including any fire parapet, may be higher than 2.5 m above ground level or the level plane set for the building within a distance of 2.5 m from the boundary.

(3) If the building is erected closer than 2.5 m to a boundary to a neighbouring property and path, the conditions in (i)-(iii) below must be satisfied:

(i) The sides facing the boundary may not have a total length greater than 12.0 m. Only the longest side of the buildings facing the boundary is measured.

(ii) No windows, doors or similar openings may be installed or formed facing the boundary.

(iii) Roof water must be retained within the building’s own plot.

If the building does not comply with all the conditions of 2.2.3.4(3)(i)-(iii) of this provision, an overall assessment as described in 2.3 must be applied.

The provision applies to all secondary buildings erected on a boundary, including buildings covered by 2.2.3.5.

From 2.5 m and further onto the plot, reference is made to 2.2.3.2(1)(i) on the inclined height-limiting plane.

Overhangs of more than 50 cm are added to the length of the building. The length of a carport must be measured 50 cm inside the limit of the roof surface.
In respect of holiday homes in designated "summer house" areas, buildings covered by 2.2.3.4(1) must comply with the provisions of 2.2.3.3; however, they may be erected no less than 2.5 m from a boundary to a neighbouring property, road and path. Within a distance of 2.5 to 5.0 m from the boundary to a neighbouring property, road and path, no part of the external walls or roof of the building, including any fire parapet, may be higher than 2.5 m above ground level or the level plane set for the building.

If the building is erected within a distance of 2.5 m and 5.0 m from the boundary to a neighbouring property and path, the conditions of (i)-(iii) must be met:
(i) The sides facing the boundary may not have a total length greater than 12.0 m. Only the longest side of the buildings facing the boundary is measured.
(ii) No windows, doors or other openings may be installed or formed facing the boundary.
(iii) Roof water must be retained within the building's own plot.

**2.2.3.5 Small buildings of no more than 10 m²**

Small buildings of no more than 10 m² are subject to the provisions of 2.2.3.5 and the provisions of 2.2.3.4(2)(ii)-(iv).

Up to two small buildings which comply with the provisions of 2.2.3.5 may be erected without a building notice or permit, see 1.6(1)(iv). It should, however, be ascertained whether there are any
private easements, declarations or public building lines, local plans or town planning by-laws etc. that may affect the erection of such buildings. The provision comprises sheds for storage, tool sheds and similar small buildings that cannot be used for habitation.

(2) Each title number entails entitlement to up to two small buildings if the conditions of (i)-(iii) below have been met.
(i) The area of each building must not exceed 10 m².
(ii) The distance from other buildings under the same title number must be no less than 2.5 m.
(iii) No part of the external walls or roof of the building may be higher than 2.5 m above ground level.

(3) Small buildings in designated “summer house” areas must not be built closer than 2.5 m to a boundary to a neighbouring property and path and must comply with the provisions of 2.2.3.5(2)(i)-(iii).

2.2.3.6 Agricultural buildings

(1) Agricultural buildings serving agricultural and forestry holdings in rural zones, which do not require permission under the Danish Planning Act or any building notice, authorisation or approval under the Danish Livestock Farming Environmental Approval Act may be built to a height of up to 12.5 m.

(2) Silos erected as part of a large building of the type listed in 2.2.3.6(1) and having a cross section of no more than 80 m² may be erected to a height of up to 20 m.

(3) Market gardens and nurseries are also subject to the rules specified in 2.2.3.6(1) for properties which it has not been possible to register as agricultural properties in the land register.

2.3 Overall assessment

PROVISION

(1) The local council determines the total footprint of a building and its impact on the surroundings, see 2.1(1), by making an overall assessment in compliance with the building control provisions of 2.3.2-2.3.5, taking account of the general criteria set out in 2.3.1.

GUIDANCE

(2.3(1)) An overall assessment means the local council’s specific assessment in compliance with the provisions of 2.3.2-2.3.5 of the total footprint of the building and its impact on the surroundings in respect of plot size, plot ratio, height and separation distances, number of storeys and the layout of the unbuilt areas, see 2.1(1). This assessment is made, in accordance with the general criteria set out in 2.3.1, by
taking into account the appropriateness of the footprint of the building for its function and by ensuring that the building is consistent with the norm for an area and that the building and its surroundings are provided with satisfactory lighting conditions and protected against an unreasonable degree of overlooking.

(2.3(2))
The overall assessment should include all provision of 2.3.1-2.3.5, including those that are not relevant to the specific building works.

2.3.1 General criteria

(1)
In the case of modifications in respect of one or more of the building control provisions set out in 2.3.2-2.3.5, the deliberations of the local council must take the following points into account:

(i) The overall footprint of the building must be appropriate for the function of the building.

(ii) The total footprint of the building must be consistent with the norm for the block, the neighbourhood or the area or with that which is envisaged for the area.

(iii) Taking account of the use of the property, satisfactory lighting conditions must be provided for buildings on the property and adjacent buildings and measures must be taken to prevent an unreasonable degree of overlooking in relation to other buildings on the same plot or adjoining plot(s).

(iv) In accordance with 2.4, sufficient open spaces must be provided in relation to the use of the property, including recreation areas for residents, users and employees.

(v) In accordance with the requirements of 2.4 and taking account of the use of the property, satisfactory pedestrian and vehicular access must be provided for the users of the property, including access for the disabled and the emergency services; sufficient parking areas also must be provided.

(vi) In the case of buildings on the edge of dense, built-up urban areas adjacent to an unzoned area or developments for detached houses, holiday homes or allotments, or a development of dense low-rise housing, determination of the total footprint of the building must take account of the character of adjacent areas and the footprint of any development.

(2.3.1(1))
The criteria listed in 2.3.1.1(i)-(vi) are an expression of the legally binding limits on the local council's assessment of building control provisions and thus express the substantive factors which the local council can and must legally take into account in its overall assessment.

(2.3.1(i))
Evaluation of whether the footprint of the building is appropriate for its function must take into account the provisions set out in 2.3.2-2.3.5. The individual provisions will not apply equally to all types of buildings. For example, recreation areas will be weighted more heavily in determining the plot ratio of a domestic building than of a commercial building, which might therefore be permitted a greater floor area. In the case of commercial buildings to which the public has access, the requirement for parking will, on the other hand, be weighted more heavily than in the case of a domestic building.

(2.3.1(ii))
"Area" means an area designated by the local council, such as a "summer house" area, a housing estate or development of single-family houses, an industrial zone or a development whose character defines it as a designated area.

In the case of development of a vacant property, an assessment must be made of what is the norm for the neighbourhood, and/or, alternatively, for the area. If the norm for a neighbourhood or area cannot be determined in such circumstances, or in the case of buildings erected in a newly designated area, due consideration must be given to the proposed character of the area. Framework provisions on plot size, floor area, number of storeys, height and separation distances specified in a local plan may be used as guidance for what is usual or proposed for the area.

(2.3.1(vii))
This provision addresses a number of "conflicting cases" in which the assessment must take the character of specified adjacent areas into account in the same way as the other considerations set out in 2.3.1(i)-(v) whereby importance is otherwise only given to the character of the building in the relevant block, neighbourhood or area, and not to the stated geographically conflicting issues.
In the case of parcelling out, registration or transfer of land, the size of the plot must be determined in accordance with the criteria specified in 2.3.1 and 2.3.1(1)(ii).

When establishing the size of the plot, all the factors specified in 2.3 may legally be taken into consideration, including in cases where the plot is sub-divided, to allow for a continued lawful use of the property. The local council may by the same token refuse to approve the size of a plot if, once sub-divided, it would be inadequate for accommodating buildings which conform to the building control requirements for unbuilt areas, including access to the property and separation distances, particularly the ratio between the height of a building and its distance from adjacent buildings.

On the basis of an overall assessment, to include the ratio between any existing buildings and the plot size, a plot size must be determined which is adequate for a building and the use of the property in accordance with the requirements of 2.3 and 2.4, and which allows for vehicular access under public roads legislation and ensures that the unbuilt areas comply with the requirements of Part 2.

2.3.3 Separation distances

(1) The distance of the building from a boundary to neighbouring property, road and path must be determined in accordance with the criteria set out in 2.3.1 and the requirements of 2.3.3(2).

(2) The distances determined in accordance with 2.3.3(1) must be sufficient to ensure that:
(i) Roof water is retained within the building’s own plot.
(ii) Windows, balconies, etc. do not provide an unreasonable degree of overlooking in relation to other buildings on the same plot or adjoining plot(s).

(3) If an area consists predominantly of dense housing, the local council may decide that new buildings must be erected so as to abut the road boundary or building line and extend to the boundary with the adjacent plots.

2.3.4 Number of storeys and heights

(1) The height of the building and number of storeys must be determined in accordance with the criteria set out in 2.3.1 subject to the allowances and limitations specified in 2.3.4(2).

(2) The height and number of storeys of the building must be determined in accordance with 2.3.4(1), taking into account the ratio between the height of the building and the distance from other buildings and open spaces on the same plot and from the buildings on adjacent plots and their open areas, and from roads and paths, in order to provide satisfactory light conditions and to prevent unreasonable overlooking.

2.3.5 Floor area

(1) The floor area of the building must be determined in accordance with the criteria specified in 2.3.1 and 2.3.1(1)(ii).
When determining the floor area for residential purposes in existing buildings, including existing unused roof spaces, the local council must give due weight to the need to provide up-to-date dwellings of a reasonable size in relation to the total area that is intended to be used.

2.4 Unbuilt areas

PROVISION

(1) The areas specified in 2.4 may be shared by several properties. The registration of the properties concerned must be such as to secure the layout, landscaping and use of such communal open spaces.

2.4.1 Recreation areas for the building

(1) Any building must be provided with recreation areas of an appropriate size for the use, footprint and location of the building.

(2) Such recreation areas must be at ground level, but may be provided in a covered or raised courtyard or may extend to roof areas or large-scale balconies.

(3) For blocks of flats and dense low-rise housing, developments including terraced and linked houses, etc., an appropriate part of the recreation area must be laid out as a playground area. The size of the playground area must be determined by the local council and must be specified in the building permit.

(4) The building permit may set a deadline in respect of the layout of recreation areas and playground areas.

2.4.2 Parking areas

(1) Sufficient parking areas must be provided (reserved) for the residents of or employees in the building, visitors, customers, suppliers, etc. to park cars, motorcycles, mopeds, bicycles, etc. on the property.

(2) The local council must determine how large a proportion of the plot area is to be provided (reserved) for parking areas, and when the area is to be laid out; this must be specified in the building permit.

(3) The layout of parking areas must include an appropriate number of parking spaces which cater for disabled people. This requirement does not apply to detached single-family houses or holiday homes in designated “summer house” areas.

2.4.3 Pedestrian and vehicular access areas

(1) Pedestrian and vehicular access must be provided from roads to entrances to the buildings on a property and to the unbuilt areas of the building.

The provision of new (additional) dwellings in an existing property may be result in a requirement to provide parking spaces and open spaces in accordance with 2.4. A contemporary dwelling means a dwelling which, as a minimum, meets the requirements set out in 3.3.

GUIDANCE

(2.4(1)) Unbuilt areas laid out in accordance with the provisions may not be used for purposes other than those for which they were provided. See section 7 of the Danish Building Act.

(2.4.1(3)) The safety requirements for playground equipment are stated in Part 4, Structures.

(2.4.2(3)) Disabled parking spaces should have a useable area of 3.5 x 5 m, be located as close to the entrance as possible and have firm, even surfacing. At least one disabled parking space should have a useable area of 4.5 x 8 m to allow for a minibus with a tail lift. Drops/rises in any stepped access from the parking area to other areas must be of no more than 2.5 cm.

DS manual 105:2012 "Outdoor areas for all – Planning and design – Guidelines for providing access for disabled persons" contains instructions for the design, layout and fitting out of the physical environment to give disabled people greater independence, freedom of movement and safety. See also Færdselsarealer for alle [Traffic areas for all] issued by the Danish Road Directorate.

(2.4.3(1)) Lighting of pedestrian and vehicular access areas must be directional and not glaring. See also the rules on private

[36x787]
the property. The layout of such pedestrian and vehicular access must be in keeping with the nature of the building. Lighting must be provided for pedestrian and vehicular access routes. Stairs and ramps must be most brightly illuminated.

(2) Pedestrian and vehicular access must be laid out so as to enable the disabled to use the building. Access from roads, including from car parks to the unbuilt area of the property and to entrances to buildings must be no less than 1.3 m wide and have firm, even surfacing. Differences in levels must be compensated for by contoured landscaping or by means of ramps, and ramps must be supplemented by steps with a rise of no more than 15 cm and a going of no less than 30 cm. Ramps must not have a gradient of more than 1:20 (5 cm per metre) and there must be a level area of no less than 1.3 m x 1.3 m at both ends of the ramp. Ramps with a gradient of more than 1:25 (4 cm per metre) must also have landings every 12 m. Graspable handrails must be provided at a height of approx. 0.8 m on both sides of ramps and steps.

(3) Footways to the building must be separated from other types of traffic by a contrasting tactile feature. Above steps on access routes, there must be a change in the colour and texture of the surfacing 90 cm before the staircase starts and across the full width of the staircase. The edges of the treads and nosings must be highlighted in a contrasting colour.

(4) Doors, gates, passages or openings required by 2.4.3(1) must be designed so as to provide easy access for emergency vehicles.

(5) Detached single-family houses used only for residential purposes and holiday homes in designated “summer house” areas are not subject to the provisions of 2.4.3(1)-(3).

3. Design, layout and fitting out of buildings

3.1 General

PROVISION

(1) Buildings must be so designed, laid out and fitted out as to provide satisfactory operational conditions in terms of safety, health, accessibility and use by all, and in terms of cleaning and maintenance.

GUIDANCE

(3.1(1)) For more detailed guidance on accessibility to buildings, reference is made to the website Universelt design og tilgængelighed [Universal design and accessibility] at: http://anvisninger.dk/tilgaengelighed/Pages/start.aspx Reference is also made to the DS/EN 14383 series "Prevention of crime – Urban planning and building design". DS manual 105:2012 "Outdoor areas for all – Planning and design – Guidelines for providing access for disabled persons" contains instructions for the design, layout and fitting out of the physical environment to give disabled people greater independence, freedom of movement and safety. The Danish working environment legislation often includes other dimensional requirements for spaces, corridor widths and layout. This applies particularly to institutions/dwellings in which technical aids are used. The publication Indretning af ældreboliger til fysisk plejekrævende [Design and layout of sheltered accommodation/dwellings adapted for assisted living for people with physical care needs] (The Danish Working Environment Authority et al.) contains guidance on appropriate provision.

(2) 

common roads set out in the Danish Act on Private Roads, according to which the local council may decide that lighting must be provided on publicly accessible roads.

(2.4.3(2)) DS manual 105:2012 "Outdoor areas for all – Planning and design – Guidelines for providing access for disabled persons" contains instructions for the design, layout and fitting out of the physical environment to give disabled people greater independence, freedom of movement and safety. Ramps with a gradient of between 1:25 and 1:20 may be fitted with guarding instead of handrails or may be contoured so as to eliminate any danger of falling sideways.

(2.4.3(3)) To prevent collision with free-standing staircases from the side or underside, the staircase should be fitted with guarding/safety railings to give headroom of 2.2 m. For the sake of the visually impaired, tread surfaces with open mesh grating, holes etc. should be avoided, or be so constructed as not to trap white canes or injure the claws of guide dogs.

(2.4.3(4)) Emergency vehicles require an entrance with a clear width of no less than 2.8 m and headway of no less than 3.4 m. In narrow streets, it may be necessary to widen the route.

(2.4.3(5)) Detached single-family houses part of which are used for commercial purposes are subject to the provisions of 2.4.3(1)-(3).
In the case of conversions, the provisions of Part 3 may be relaxed if the local council is satisfied that the conversion work cannot otherwise be carried out without extensive alterations to the building. This provision does not apply to buildings covered by 1.3.1 and 1.3.2.

If this provision applies, the conversion work must be carried out with the greatest possible provision for those with impaired mobility and orientation. Conversion work must otherwise provide a layout which is appropriate for its intended use.

In the case of buildings covered by 1.3.1 and 1.3.2, exemption can be sought from the provisions of Part 3 if it is not deemed possible for the conversion to satisfy the specified requirements.

Implementation of this provision also requires the local council to undertake a separate assessment of the conversion project, of the structures of the building and other constructional matters.

If the provisions of Part 3 can be satisfied without extensive alterations to the building, the conditions which require the implementation of this provision do not apply.

See Executive Order on Accessibility Provisions in Connection with Alteration of Existing Buildings and the Vejledning til kommunerne om byggesagsbehandling af tilgængelighedsbestemmelser [Guidance for local authorities in respect of accessibility provisions in applications].

(3) Holiday homes in designated "summer house" areas are not covered by the provisions of Part 3.

(3.1(3)) A designated "summer house" area is an area which is designated in the local plan as a holiday home area.

3.2 Access/Accessibility

3.2.1 General

(1) Access to buildings must ensure accessibility for all. Each dwelling and other unit must be directly accessible from the outside or via a shared access route from the outside.

(2) External doors must provide level access to units and to any lifts on the ground floor (access storey) of the building. Any differences in levels must be evened out in the access area outside the building. Ramps may be used. Outside external doors, there must be a horizontal, firm and level area of 1.5 m x 1.5 m measured from the hinged side of the door. If the door opens outwards, there must be an additional 20 cm along the facade of the building. The area outside external doors must be flush with the internal floor. The area at external doors must have tactile markings or be of a different colour from the surrounding surface finish.

Entry telephones and intercom systems must have the facility to acknowledge both audibly and visually that the equipment has been activated, and that a connection has been made with the recipient. If the operating panel of an entry telephone or intercom system uses numbers, the number 5 must be marked with a tactile identification.

(3.2.1(2)) In addition to entrance doors, this provision covers doors on escape routes and emergency exits on the ground floor as well as garden, balcony and terrace doors. “Level access” means that there must not be a step between the level (ground level) outside the building and the ground floor units or any lifts. Stair lifts, lifting platforms and loose scraper mats are not permitted under this provision.

Doorsteps with a height of no more than 2.5 cm are accepted. Entry telephones and intercom systems should be located at a height of between 90 and 120 cm above the floor/ground.
In buildings which are accessible to the public and which have a public-facing service function, essential information on wayfinding in and use of the building must be easy to see, read and understand. This requirement only applies to the part of the building to which the public has access and has a public-facing service function.

Doors must have a clear passage width of no less than 0.77 m. If the door opens towards the user, there must be no less than 50 cm on the side of the door opposite its hinged side. Doorsteps may be no more than 2.5 cm high.

The clear passage width is measured with the door 90 degrees open. This provision covers doors on shared access routes, including at least one door to each unit on each of the storeys of the building.
3.2.2 Shared access routes

PROVISION

(1) Shared access routes must be sufficiently wide for their intended use, must allow unobstructed passage across their full width and must be identified by contrasting materials, colours or lighting. The clear width must be no less than 1.3 m.

GUIDANCE

(3.2.2(1)) Shared access routes serve two or more dwellings, offices, meeting rooms or other units and include storm porches, lobbies, corridors, access balconies, covered access balconies, the space in front of lifts, ramps and landings both inside and outside the building, including the external area giving access to any basement.

The working environment legislation requires certain industrial or commercial buildings to be designed for use by particular vehicles such as trucks. Most shared access routes are also escape routes and must therefore also comply with the provisions of Part 5 on fire safety for escape routes.
(2) Shared access routes must provide level access to all units on each storey in the building. Any steps and differences in level must be compensated for by ramps. Ramps must not have a gradient of more than 1:20 (5 cm per metre) and there must be a level area of no less than 1.3 m x 1.3 m at both ends of the ramp. Ramps to accommodate differences in level of more than 60 cm must in addition be provided with a level landing for each 60 cm rise. Ramps must be provided with handrails. Ramps with a gradient of 1:25 (4 cm per metre) or less do not need to be fitted with handrails.

(3) Stairs on shared access routes must be designed with sufficient width and headroom for their intended use.

(4) Stairs on shared access routes must have a gradient (going and rise) that makes them safe and easy to use. The rise of stairs must not exceed 18 cm. On straight flights and quarter-turn and half-turn staircases, the going must not be less than 28 cm, subject to a minimum of 25 cm in domestic buildings. On spiral and winding staircases, the going must not be less than 20 cm.

(3.2.2(2))
This provision covers level access to lifts, residential and business units and shared areas, including outdoor recreation areas on the different storeys. Any steps and differences in level within units accessible by the public should be compensated for by ramps, chair lifts or similar. Balconies must be regarded as independent units. Terraces on the roof of the building are exempt from this requirement, provided they are not accessed by lifts.

Rampebredde, mindst 1,3 m

Repos, mind 1,3 x 1,3 m

Hældning højst 1:20, (50 mm pr. m)

Højst 0,6 m stigning inden mulighed for hv

(3.2.2(3))
This requirement may be met by building stairs with a clear width of no less than 1.0 m and headroom of no less than 2.1 m. If there are only a few users, for example in two-family houses, the requirement may be satisfied by a clear width of no less than 90 cm. If there are multiple users, the width should be increased accordingly. The height must be measured above the walking line. The clear width must be measured horizontally between the handrails or, if there is only a handrail on one side, between the wall, central newel post etc. and the handrail.

(3.2.2(4))
Stairs with a lesser gradient (lower rise and deeper going) than the specified requirements are easier and safer to use. The going must be measured on the walking line, i.e. at the centre of the clear width of the staircase, but no more than 50 cm from the inner handrail. Staircases should be fitted with risers and the outermost edge of the tread surface and the nosing should be marked in a contrasting colour.

Markering af trinforkant

Stødtrin

Stigning, højst 180 mm

Grund, mindst 280 mm
Buildings with three storeys or more must be fitted with at least one lift that can serve each floor, including any habitable roof space and basement. Single-family houses are exempt from this provision.

Buildings equipped with lifts must have at least one lift the size and construction of a type 2 lift in accordance with DS/EN 81-70, Safety rules for the construction and installation of lifts – Particular applications for passenger and goods lifts – Part 70: Accessibility – including disabled access – to lifts for people.

3.2.3 Guarding

Taking account of the use of the building, corridors, staircases and ramps on shared access routes as well as balconies, French windows, balcony doors, access balconies, air locks, roof terraces, external staircases and other elevated recreation areas must be secured by guarding and fitted with handrails. Handrails must be easy to grip and hold onto.

The design of all types of guarding or railings must take account of the use of the building and make adequate safety provision for users. Guarding made of glass must comply with the provisions of Part 4, Structures.

3.3 Dwellings

3.3.1 Design, layout and fitting out of dwellings

The design and fitting out of a dwelling, and the size and layout of individual rooms, must be such that both the dwelling as a whole and the individual rooms are adequate for their intended use. The local council may require documentation demonstrating compliance with this requirement, for example an exposition of furniture layout options.
In addition to habitable rooms, a dwelling must have a kitchen, bathroom and rooms containing sanitary conveniences.

The kitchen may either be a separate room or form part of a habitable room; or it may be a cooking recess in residential units of less than 50 m².

There must be sufficient storage space inside and outside blocks of flats and linked single-family houses for clothing, kitchen utensils and other equipment, bicycles, pushchairs and prams, and space to wash and dry clothing.

Habitable rooms and kitchens must have sufficiently high ceilings. The ceiling height must be determined by reference to the size and depth of the rooms and the location of windows in the dwelling.

The floor of habitable rooms and kitchens must not be lower than the ground outside. In the case of exceptional site conditions, this provision may be waived if the floor lies above ground level along at least one wall with a window.

Kitchens must have sufficient space for kitchen tasks to be carried out in a practical, safe manner.

Mezzanine platforms (galleries/sleeping platforms) are not deemed to be separate habitable rooms if their floor area does not exceed 4.5 m².
If several mezzanine platforms (sleeping platforms/galleries) are interconnected, the area of these must be added together.

3.3.2 Bathrooms and sanitary accommodation

**PROVISION**

(1) A dwelling must have at least one sanitary convenience at entry level, with level access and appropriate layout and dimensions.

(2) There must be a washbasin in or adjacent to the room containing the sanitary convenience.

**3.3.3 Width of doors**

**PROVISION**

(1) Doors on the access storey of a dwelling must have a clear width of no less than 77 cm.

**3.3.4 Width of corridors**

**PROVISION**

(1) Storm porches, entrance halls, corridors and similar access spaces must be laid out so as to allow unobstructed passage across their full width.

**GUIDANCE**

(3.3.2(1)) This requirement may be satisfied by a clearance of no less than 1.1 m from sanitary fittings such as the washbasin and WC. Greater clearance improves comfort and user-friendliness. For appropriate layouts for people with impaired mobility; see SBI Guidelines 249, *Tilgængelige boliger* [Accessible dwellings].

(3.3.3(1)) This provision applies to external doors, doors to storm porches, entrance halls, corridors and similar access spaces and at least one door to each habitable room, kitchen, bathroom and sanitary convenience on the access storey of the dwelling.

(3.3.4(1)) This requirement may be complied with by a clear width of no less than 1.0 m in the access spaces. If there are doors or cupboard doors at the sides of a circulation space, the width of that space should be increased by at least 30 cm. Greater clearance improves comfort and user-friendliness.
3.4 Buildings other than domestic buildings

3.4.1 General

(1) To the extent that other buildings may be comparable with domestic buildings, the provisions of 3.3 on the design, layout and fitting out of dwellings apply to these buildings. The provisions of 3.3 also apply if the local council considers that they are compatible with the requirements that apply in view of the function of the building.

(2) In buildings containing places of work which are subject to the Danish Working Environment Act, the design, layout and fitting out of workrooms must comply with the requirements of 3.4.2, and rooms containing sanitary conveniences, bathrooms/showers and ancillary spaces must be provided in accordance with the provisions of 3.4.4 and 3.4.5. The place of work must also comply with the requirements of the Ministry of Labour’s Executive Order on the Conditions at Permanent Places of Work in respect of circulation routes and areas, workrooms, temperature conditions etc., ventilation, lighting, maintenance and cleaning as well as welfare provisions, including dining areas, washbasins, cloakrooms, changing rooms, bathrooms/showers, rest areas and sleeping accommodation.

(3.4.1(2)) The applicable executive order issued by the Danish Working Environment Authority on the conditions at permanent places of work identifies the types of industrial buildings for which applications are processed by the local council without involving the Danish Working Environment Authority. Please see also the range of guidelines and instructions issued by Danish Working Environment Authority in conjunction with this executive order. Note that exemption pursuant to section 22 of the Danish Building Act may only be granted by the local council within its sphere of competency under the Act.

(3) In agricultural buildings in which places of work covered by the Danish Working Environment Act are set up, the workplace must be laid out in accordance with the Ministry of Labour’s Executive Order on the Conditions at Permanent Places of Work.

(4) Buildings not covered by the provisions of 3.3 or 3.4.1(1)-(3) must be laid out in accordance with such health and safety requirements as the local council may impose in each individual case in respect of design, layout and fitting out of the buildings.

(5) On storeys in buildings where the sanitary conveniences are accessible to the public or are designated for people other than those employed in the building, at least one sanitary convenience must comply with the provisions of (i)-(viii) below. At least one sanitary convenience laid out in accordance with (i)-(viii) below must be provided on the ground floor or on other storeys with access via a lift, stair lift, etc.

(i) Level access must be provided to sanitary accommodation.

(ii) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(iii) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(iv) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(v) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(vi) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(vii) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(viii) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

The applicable executive order issued by the Danish Working Environment Authority on the conditions at permanent places of work identifies the types of industrial buildings for which applications are processed by the local council without involving the Danish Working Environment Authority. Please see also the range of guidelines and instructions issued by Danish Working Environment Authority in conjunction with this executive order. Note that exemption pursuant to section 22 of the Danish Building Act may only be granted by the local council within its sphere of competency under the Act.
(v) There must be a clear manoeuvring area with a diameter of 1.5 m in front of the WC, clear of the opening arc of the door.

(vi) The toilet seat must be at a height of 48 cm.

(vii) Lifting armrests must be fitted at a height of 80 cm on both sides of the WC.

(viii) The washbasin must be fitted at a height of approx. 80 cm, with the drain recessed below the washbasin.

(6) In the case of conversions, sanitary conveniences covered by 3.4.1(5) must be laid out so that they can be used by people in wheelchairs. At least one sanitary convenience which can be used by people in wheelchairs must be provided on the ground floor or on other storeys which are accessible by a lift, stair lift, etc.

(7) In publicly accessible areas and premises with fixed audience seating, an appropriate number of seats must be provided for wheelchair users.

3.4.2 Workrooms

PROVISION

(1) The size, ceiling height and volume of work rooms must be sufficient to allow work to proceed in a safe manner, as appropriate for the function of the space and the number of people normally working there.

(2) The area and volume of normal classrooms in schools etc. as well as in occupiable rooms in childcare institutions, must be sufficient for the number of children and employees in the institution. Occupiable rooms in childcare institutions must have a clear floor area of no less than 3 m² per nursery-age child and 2 m² per pre-school child. Normal classrooms in schools etc. must, subject to the provision of effective ventilation, have a volume of no less than 6 m³ per person.

(3) The floor in occupiable rooms in childcare institutions and residential childcare institutions and in normal classrooms in schools, etc. must not be lower than the ground outside. In the case of exceptional site conditions, this provision may be waived if the floor lies above ground level along at least one wall with a window.

GUIDANCE

(3.4.2(1)) Compliance with this requirement may be achieved even in small work rooms by providing headroom of at least 2.5 m and a volume of no less than 12 m³ per person working in the room.

If there are likely to be a significant number of people in a workroom who are not working there, the volume must be increased to suit the number of such people. The local council may permit a reduction in volume if the room is provided with effective mechanical ventilation, but in such cases the volume should not be less than 8 m³ per person.

Under the Danish Working Environment Act, a workroom is any room in which work is carried out.

(3.4.2(2)) The calculation of volume must only include those parts of the room where headroom is sufficient to accommodate workplaces. The calculation must also allow for any significant reduction in volume due to machinery, furniture and stored items, etc.

Any part of the room that is more than 4.0 m above the floor must not be included in the calculation of the volume. For ventilation in day childcare institutions and normal classrooms in schools, etc., see 6.3.1.3(1)-(2).

(3.4.2(3)) The drawing shows an example of where this requirement has been waived, as the floor along the entirety of a wall with a window is above ground level.
3.4.3 Dining areas

PROVISION

(1) Where a dining area is required due to the nature of the work, it must be conveniently located in relation to the workstations.

GUIDANCE

(3.4.3(1)) Under the Danish Working Environment Act, a dining area must normally be provided if more than three people are employed at the place of work at the same time. Dining areas must not open directly onto a room containing a sanitary convenience or the anteroom of such a room.

(2) Dining areas must be provided with a sink and cooking facilities, and with windows which afford a view of the surroundings.

3.4.4 Sanitary accommodation

PROVISION

(1) Access from work rooms and occupiable rooms to a room containing a sanitary convenience must be through an anteroom.

(2) The number of sanitary conveniences must be appropriate for the number of employees.

GUIDANCE

(3.4.4(1)) The anteroom may be shared by several sanitary convenience cubicles.

(3.4.4(2)) This requirement may be complied with by providing at least one WC for every 15 employees. If urinals are provided for men, the number of WCs may be reduced to one for every 20 employees. In such cases, there should be at least one urinal for every 20 men. Separate WCs should be provided for men and women unless each individual WC is installed in a separate room with an anteroom which does not contain urinals.

(3) Rooms containing sanitary conveniences or their anterooms must be provided with washbasins.

(4) In office and administrative buildings, at least one room containing a sanitary convenience on each storey on which sanitary conveniences are provided must comply with the requirements of (i)-(vii) below.

(i) The clear passage width of a door to a room containing a sanitary convenience must be no less than 77 cm.

(ii) The washbasin and WC must be fitted at the corners of two adjoining walls such that the washbasin can be reached by a person on the WC.

(iii) There must be a clear distance of no less than 90 cm on the side of the WC that faces away from the washbasin. No fixed furniture must be mounted next to the WC on the wall facing the washbasin.

(iv) There must be a clear manoeuvring area with a diameter of 1.5 m in front of the WC, clear of the opening arc of the door.

(v) The toilet seat must be at a height of 48 cm.

(vi) Lifting armrests must be fitted at a height of 80 cm on both sides of the WC.

(vii) The washbasin must be fitted at a height of approx. 80 cm, with the drain recessed below the washbasin.

At least one sanitary convenience laid out in accordance with (i)-(vii) above must be provided on the ground floor or on other
storeys with access via a lift, stair lift, etc.

(5) In the case of conversions, sanitary conveniences covered by 3.4.4(4) must be laid out so that they can be used by people in wheelchairs. At least one sanitary convenience which can be used by people in wheelchairs must be provided on the ground floor or on other storeys which are accessible by a lift, stair lift, etc.

3.4.5 Bathrooms and changing rooms

PROVISION

(1) If showers/bathrooms are required by 3.4.1(2), the number of showers, which must be suitably laid out, must be appropriate for the number of employees. Changing rooms must be provided in conjunction with showers/bathrooms.

GUIDANCE

(3.4.5(1)) This requirement can be satisfied by providing at least one shower for every ten employees. Changing rooms should be screened from showers/bathrooms.

Under the Danish Working Environment Act, there must be separate men’s and women’s bathrooms or provision for men and women to use the bathroom individually.

(2) Sanitary conveniences must be provided in conjunction with bathrooms.

(3) In the case of work which is dirty or hazardous to health, business and industrial workplaces must provide an appropriate number of freely accessible washbasins.

GUIDANCE

(3.4.5(3)) This requirement may be satisfied by providing at least one washbasin for every 5 employees. Washbasins in sanitary conveniences or lockable anterooms are not included in this number of washbasins.

(4) Bathrooms and other rooms with washing facilities must be fitted with floor gullies.

3.5 Accessible layout of user-operated installations

PROVISION

(1) User-operated installations such as IT points, ATMs, self-service machines and similar installations for public-interfacing service functions must be erected so that they can be used by people with impaired functional abilities.

GUIDANCE

(3.5(2)) This requirement corresponds to the access requirement in respect of unbuilt areas for buildings specified in Part 2. This requirement may be complied with by evening out the ground level or by providing ramps as specified in Part 3.

(3) User-operated installations must be installed at a height that allows them to be operated by a person in a wheelchair.

GUIDANCE

(3.5(3)) This requirement may also be satisfied by installing height-adjustable units.

3.6 Hotels etc.

PROVISION

(1) In the case of hotels, inns and similar accommodations, at least one fifth of the bedspaces with en suite facilities must have wheelchair access in accordance with 3.3.2(1).

GUIDANCE

(3.6(2)) A "bedspace" is defined as a bed standing on the floor. Folding, sofa and bunk beds do not count as bedspaces. Beds over 1.4 m wide count as double beds. The design, layout and fitting out of accessible bedspaces with en suite facilities should include:
- level access to the room and to its en suite facilities.

(2) Pursuant to 3.6(1), buildings with 10-20 bedspaces must provide at least two fully wheelchair-accessible bedspaces with en suite facilities. Pursuant to 3.6(1), buildings with 21-40 bedspaces must provide at least four fully wheelchair-accessible bedspaces with en suite facilities.
(3) In accordance with 3.6(1), buildings with more than 40 bedspaces must have at least one fully wheelchair-accessible bedspace with en suite facilities for each additional 20 bedspaces.

(4) Buildings with at least 10 fully wheelchair-accessible bedspaces with en suite facilities will comply with the requirements of 3.6(1)-(3) irrespective of the total number of bedspaces.

(5) As set out in 3.6(1), balconies connected with rooms must be so designed as to be accessible to and useable by the disabled.

4. Structures

4.1 General

PROVISION

(1) Buildings must be constructed so as to provide satisfactory conditions in terms of function, safety, sustainability and health. Buildings must be constructed in accordance with best practice, using materials which are appropriate for the purpose.

(2) Load-bearing structures must be designed to withstand normally occurring static and dynamic loads.

(3) Foundations must be taken down to frost-free depth and load-bearing ground or must otherwise be constructed so as to prevent damage resulting from earth surface movements. Beds for sewer pipes and drainpipes, foundation structures etc. must be frost-proofed.

(4) Roofs and skylights in roofs must be sufficiently protected against people on the roof treading through them.

(5) a clear manoeuvring area with a diameter of 1.5 m clear of the opening arc of the door; this applies both to the sleeping accommodation and its en suite facilities.

- a clear passage width of at least 77 cm in doorways to the bedroom and its en suite facilities.

- washbasin and WC must be fitted at the corner of two adjoining walls such that the washbasin can be reached by a person on the WC.

- a clear distance of at least 90 cm on the side of the WC that faces away from the washbasin. No fixed furniture must be mounted next to the WC on the wall facing the washbasin.

- the toilet seat at a height of 48 cm.

(4.1(1)) Proper and workmanlike construction of building works includes not only load-bearing capacity, health and safety provisions and a given durability, but also measures against rats and other pests. The provisions also cover the construction period. To comply with the provisions, measures to prevent collapse etc. during construction must be taken.

Load-bearing structures which are founded directly on the subsoil must be protected against radon; see Part 6 on radon proofing. The whole construction must be airtight to reduce energy consumption; see Part 7 on energy consumption.

(4.1(2)) Other factors such as sound insulation and fire may also be subject to design consideration.

(4.1(3)) Solutions for external frost protection of foundations must be sufficiently robust and reliable to maintain frost protection throughout the lifetime of the building.
Climate control measures essential to the proper construction of the building must be taken as necessary during planning, design, tendering for and erection of its load-bearing structures.

This provision includes ensuring that wet moisture-sensitive materials as well as materials and building elements which are affected by mould are not incorporated during the construction period. This may be achieved, for example, constructing in fully enclosed conditions and by appropriate storage of building materials.

Adequate quality assurance procedures are also extremely important in this context. See the Executive Order on Building and Civil Engineering Works in the Period 1 November to 31 March issued by the Danish Enterprise and Construction Authority.

The functional requirement may, for example, be complied with by:

- focusing during the planning and design phase on avoiding materials and constructional solutions that are unduly moisture-sensitive.

- explicitly allocating time in the client’s tendering plan and time schedule for all necessary drying out of building materials and structures.

- the client carrying out a cost-benefit analysis, in advance of inviting tenders if possible, of the benefits of fully enclosing the building during construction and prescribing total enclosure if it is financially viable, or where the tender documents specify particularly moisture-sensitive materials or constructional solutions.

- the client, when tendering trade contracts, providing shared facilities for storage of moisture-sensitive materials.

(4.1(6))

This requirement minimises the risk of moving into overly damp buildings and the risk of growth of mould. This applies to both new builds and renovation projects. When determining the critical moisture content of the material, account must be taken of any surface dirt.

This requirement must be read in conjunction with 4.1(5).

(4.2)-4)

A row of linked single-family houses (semi-detached houses and terraced houses) may be designed as one building, regardless of types of ownership and registration of title. See the provision set out in 1.3.2.

In the case of wind turbines, the requirements of this Part 4 may be deemed to have been fulfilled if the wind turbine is built in accordance with the approval granted under the executive order on the technical certification scheme for the design, manufacture and installation of wind turbines issued by the Danish Energy Authority. See DS/INF 1990, Consequence classes for Code of practice for building constructions.

DS/EN 1992-3, Liquid retaining and containment structures, with DS/EN 1992-3 DK NA sets out supplementary rules for the design of liquid retaining and containment structures, and of other concrete structures which require liquid repellent protection.

When a construction or building is designed by applying a standard, due regard must be paid to the eurocodes mentioned in 4.2(1) and the standards described in 4.2(2)-(4) with related national annexes.

For tents and similar temporary structures, see DS/EN 13782, Temporary structures – Tents – Safety.
for stainless steel, with DS/EN 1993-1-4 DK NA
DS/EN 1993-1-5, Design of steel structures, Plated structural elements, with DS/EN 1993-1-5 DK NA
DS/EN 1993-1-6, Design of steel structures, Strength and stability of shell structures, with DS/EN 1993-1-6 DK NA
DS/EN 1993-1-7, Design of steel structures, Plated structures subject to out of plane loading, with DS/EN 1993-1-7 DK NA
DS/EN 1993-1-8, Design of steel structures, Design of joints, with DS/EN 1993-1-8 DK NA
DS/EN 1993-1-9, Design of steel structures, Fatigue, with DS/EN 1993-1-9 DK NA
DS/EN 1993-1-10, Design of steel structures, Material toughness and through-thickness properties, with EN 1993-1-10 DK NA
DS/EN 1994-1-2, Design of composite steel and concrete structures, Structural fire design, with DS/EN 1994-1-2 DK NA
DS/EN 1995-1-2, Design of timber structures, Structural fire design, with DS/EN 1995-1-2 DK NA
DS/EN 1996-1-1, Design of masonry structures, General rules for reinforced and unreinforced masonry structures, with DS/EN 1996-1-1 DK NA
DS/EN 1996-1-2, Design of masonry structures, Structural fire design, with DS/EN 1996-1-2 DK NA
DS/EN 1996-2 Design of masonry structures, Design considerations, selection of materials and execution of masonry, with DS/EN 1996-2 DK NA
DS/EN 1997-1 Geotechnical design, General rules, with DS/EN 1997-1-10 DK NA
DS/EN 1999-1-1 Design of aluminium structures, General structural rules
DS/EN 1999-1-2, Design of aluminium structures, Structural fire design, with DS/EN 1999-1-2 DK NA
DS/EN 1999-1-3, Design of aluminium structures, Structures susceptible to fatigue, with DS/EN 1999-1-3 DK NA

(2) The design of concrete structures is subject to DS/EN 206-1, Concrete, specification, performance, production and conformity, and DS 2426, Concrete – Materials – Rules for application of DS/EN 206 in Denmark.

(3) Design of lightweight concrete structures with lightweight aggregates is subject to DS/EN 1520, Prefabricated reinforced components of lightweight aggregate concrete with open structure with structural or non-structural reinforcement with DS/EN 1520 DK NA.

(4) The design of structures in autoclaved aerated concrete is subject to DS/EN 12602, Prefabricated reinforced components of autoclaved aerated concrete; and to DS/EN 12602 DK NA.

(5) Derogation from the provisions listed in 4.2(1) may be permitted provided that the local council is given documentary evidence that such derogation is safe.

(6) When materials and constructions not covered by the Eurocodes listed in 4.2(1) are used, documentation must be provided demonstrating that satisfactory safety conditions are in place. It may be advantageous to include test results, standards or generally recognised guidance notes and guidelines in the documentation provided that the safety level, including any third party monitoring, is equivalent to that specified in 4.2(1)-(4).

(7)
Garages, carports, roofed-over terraces, outbuildings, greenhouses and similar buildings; and equipment houses for electronic communications networks; or facilities with an area of no more than 50 m² may be built without figures and calculations demonstrating their strength and stability.

These buildings are still covered by 4.1.

(8)
The provisions of 4.2(1) apply to nursery/market garden hothouses/greenhouses and to canopied farm slurry lagoons, subject to the relaxation that the requirements in respect of snow loads may be reduced by 65%.

(4.2(8)) Requirements to snow loads may only be reduced by 65% pursuant to 4.2(1) if the hothouse/greenhouse is heated to such an extent that no snow accumulates. As an alternative to heating, the hothouse/greenhouse may be designed to facilitate snow removal.

4.3 Glazed panels, glass surfaces and structural glazing

PROVISION

Glazed panels, glass surfaces and structural glazing must be designed and constructed so as to provide satisfactory safeguards against personal injury. The provision does not cover glass used in windows and doors, unless special conditions apply in respect of its location or use of the building.

(4.3(1)) This provision covers design and construction of glass in roofs, walls, facades, doors, windows, ceilings, guardings, etc. See DS/INF 119, Glass in buildings – Guidelines for the selection and the use of safety glass – Personal safety.

(2) For glazed panels, glass surfaces and structural glazing, any risk of personal injury due to collision with the glass must be prevented.

(4.3(2)) This provision applies to buildings where the use of glass in e.g. glass doors, glass walls and glass facades may entail a risk of persons colliding with the glass. This may be buildings used by many people or where the use of the building may increase the risk of colliding with the glass. Such glazed panels should therefore be marked and shielded. Manifestation should be positioned and designed so as to be conspicuous and clearly visible to all, including people with impaired vision. Guarding fitted to glazed panels as shielding and protection against personal injury must be constructed in accordance with the provisions of 3.2.3.

4.4 Playground equipment etc.

PROVISION

Playground equipment etc. in playgrounds that are accessible to the public must be designed and built with satisfactory health and safety provision for the prevention of personal injury.

(4.4(1)) The provision solely applies to equipment accessible to the public. The provision also applies to exercise equipment erected on areas accessible to the public. Reference is made to the following standards, stating the specifications which must be met in order to provide as much protection as possible against the risks associated with children using playground apparatus. Other technical specifications may also be used provided they ensure equally satisfactory safety conditions. This provision also covers skateboard courts etc. For exercise equipment that is also used as playground equipment, the actual use of the equipment must form the basis for the standards applied.

Playground equipment:
- DS/EN 1176-1 Playground equipment and surfacing - Part 1: General safety requirements and test methods
- DS/EN 1176-2 Playground equipment and surfacing - Part 2: Additional specific safety requirements and test methods for swings
- DS/EN 1176-3 Playground equipment and surfacing - Part 3: Additional specific safety requirements and test methods for slides
- DS/EN 1176-4 Playground equipment and surfacing - Part 4: Additional specific safety requirements and test methods for cableways
- DS/EN 1176-5 Playground equipment and surfacing - Part 5: Additional specific safety requirements and test methods for carousels
- DS/EN 1176-6 Playground equipment and surfacing - Part 6: Additional specific safety requirements and test
4.5 Moisture and durability

PROVISION

(1) Buildings must be built so as to prevent water, moisture and damp from causing damage or undermining serviceability, impairing durability and vitiating health and safety conditions; see also Part 6, Indoor climate.

(2) Buildings must be protected against detrimental accumulations of moisture condensation as a result of the movement of moisture-laden indoor air. Buildings must also be protected against absorption of ground moisture.

(3) Measures must be taken to divert surface water from around buildings, including any roof water discharged at ground level. Measures must be taken to protect the building against ingress of water from groundwater and percolating surface water. If drainage is used, this must be in accordance with the DS 436 Code of practice for the groundwater drainage of structures etc.

(4) The building envelope must be built so as to seal it against ingress

GUIDANCE

(4.5(1))
Moisture effects may arise from rain, snow, surface water, groundwater, water-level rises, soil moisture, construction moisture, domestic water and humidity of the air, including moisture condensation. See the Danish Enterprise and Construction Authority's guide to handling moisture in construction.

(4.5(2))
Condensation on cold, internal surfaces usually occurs as a result of unintended high air humidity combined with insufficient ventilation and poor movement of air in areas with cold surfaces. Cold internal surfaces may occur at structural cold bridges, at building envelope sections with low insulating properties, through leaks in the building envelope, at service penetrations, on windows, etc. In connection with newbuilding and renovation, the moisture loading should be included in the assessment of whether all rooms are adequately ventilated and have sufficient movement of air. In connection with the choice of ventilation strategy, structures and building elements, the design, execution and use phase should consider the moisture production, air exchange and movement of air in the building so as to create healthy indoor climate conditions and so that building components and structures do not erode.

(4.5(3))
For drainage systems; see 8.4.3.

(4.5(4))
The building envelope includes in this context roofs,
of rain and snow melt water. Roofs must be built so as to allow rain and melt water from snow to run off in an appropriate manner. Roof water must be discharged into drains via gutters and/or rainwater downpipes. Unless the local council requires otherwise in individual cases, gutters may be omitted from buildings in particularly open locations, including holiday homes, and from garages, outbuildings and similar ancillary buildings, provided the roof water does not represent a nuisance to a stretch of road or to an adjacent plot.

(5) Wet rooms, including bathrooms, utility rooms and sanitary conveniences with floor gullies must comply with the following provisions:
   (i) Floors and walls must be constructed so as to resist the moisture and mechanical and chemical effects that normally occur in wet rooms.
   (ii) Floors and flooring, including joints, connections, pipe penetrations etc. must be watertight.
   (iii) Walls and wall linings, including joints, connections, pipe penetrations, etc. must be watertight in the part of the room which is subject to the effects of water.
   (iv) Water on the floor must drain away into a floor gully.
   (v) No pipe penetrations may be made in any part of a wet room which is expected to be regularly affected by water.
   (vi) If stud walls and floor and wall constructions containing timber or other organic materials are used, an adequate waterproofing system must be in place.

4.6 The building site

PROVISION

(1) Building sites must be laid out so as to avoid causing nuisance to nearby plots or the public and private road and footpath areas. Access to sites must be appropriately surfaced and maintained.

(2) Satisfactory fire precautions must be in place on building sites and while building work is in progress.

(3) Structures on building sites must be sufficiently far from boundaries to neighbouring property, road and path or must be so built as to eliminate the risk of the spread of fire to buildings on other plots. Structures that are not on a building site, but where the location of the structure is directly connected to the building work in progress, must also be so placed and built as to eliminate the risk of the spread of fire to other buildings.

5. Fire safety

5.1 General

PROVISION

(1) Buildings must be constructed, laid out and fitted out so as to achieve satisfactory protection against fire and the spread of fire to other buildings on the same and neighbouring plots. There must be appropriate provision for rescuing people and for fighting fires. Appropriate provision must be made in livestock housing for protecting livestock in the event of fire.

GUIDANCE

(5.1(1)) The scope of fire safety documentation is specified in 1.3. For fire safety measures in traditional buildings, including single-family houses, terraced houses and holiday homes as well as agricultural buildings, see the Danish Energy Agency’s Eksempelemåling om brandsikring af byggeri [Collated examples of fire safety measures in buildings]; and for more non-traditional buildings see the Danish Enterprise and Construction Authority’s Information om brandteknisk dimensionering [Information on structural fire
5.1.1 Usage categories

(1) A building section must be assigned to one of the following usage categories depending on the use of the building section:

- Usage category 1 comprises building sections for daily occupancy, in which the people who normally occupy the building section are all familiar with the escape routes from the building section and capable of taking themselves unaided to a place of safety.
- Usage category 2 comprises building sections for daily occupancy by a few people in each room, in which the people who occupy the building section are not necessarily familiar with the escape routes from the building section but are capable of taking themselves unaided to a place of safety.
- Usage category 3 comprises building sections for daily occupancy by large numbers of people, in which the people who occupy the building section are not necessarily familiar with the escape routes from the building section but are capable of taking themselves unaided to a place of safety.
- Usage category 4 comprises building sections for night time occupancy, in which the people who occupy the building section are familiar with the escape routes from the building section and are capable of taking themselves unaided to a place of safety.
- Usage category 5 comprises building sections for night time occupancy, in which the people who occupy the building section are not familiar with the escape routes from the building section but are capable of taking themselves unaided to a place of safety.
- Usage category 6 comprises building sections for day time occupancy, and in some cases also for night time occupancy, in which the people who occupy the building section are not capable of taking themselves unaided to a place of safety.

(2) The fire safety of a building must be maintained throughout the lifetime of the building.

(5.1(2)) For the fire safety of a building to be maintained throughout the lifetime of that building, the fire safety installations and building elements must be regularly checked and maintained. Note also that conversions of or other alterations to the building must not be in breach of the rules governing fire safety. Note also that change of use of the building may necessitate modification of existing fire safety measures.

Agricultural buildings are exempt from the provisions of Part 5 except as they relate to:

- general in 5.1,
- escape routes in 5.2,
- structural factors in 5.3 (apply only to livestock housing)
- fire safety installations in 5.4 (apply only to livestock housing)
- Spread of fire and smoke in 5.5.
- access for the emergency services in 5.6.
5.2 Escape routes and rescue provisions

PROVISION

(1) Buildings must be laid out so as to facilitate safe, easy evacuation via escape routes or directly to the outside. Evacuation must be to ground level outside or to a safe place in the building. Suitable provision must be made in livestock housing for both the livestock and the emergency services.

(2) Escape routes must be easy to identify, reach and use.

(3) Exits and escape routes must be designed for the people whom the exits and escape routes are intended to serve. Doors on escape routes must be easy to open without keys or tools during the hours when the building is in use. Doors on escape routes which are used by large numbers of people must open in the direction of escape.

(4) Extreme temperatures, smoke concentrations, heat radiation or other factors that might obstruct evacuation must not be allowed to arise within the timescale within which the escape routes are used for evacuation.

(5) Wall and ceiling finishes and flooring on escape routes must be formed such that they do not accelerate the spread of fire or smoke in the timescale within which the escape routes are used for evacuation.

(6) A fire-resisting occupiable unit must have rescue openings as specified in 5.2(7) and 5.2(8) unless a corresponding safety level can be achieved by other means.

GUIDANCE

(5.2(1)-(8))
Escape routes must also comply with the provisions of 3.2, Access/Accessibility. A safe place in the building is a place where people/animals are not in imminent danger, and from which it is possible to evacuate them to ground level in the open air.

(5.2(3))
In the context of escape routes, “large numbers of people” normally means more than 150 people using the escape route in question.

(5.2(6))
A corresponding safety level can be achieved by, for example, providing at least two escape routes that are independent of each other. In this context a fire-resisting unit might be a room, a fire compartment or a fire section. In traditional buildings, exits to escape routes should be located at or immediately next to opposite ends of the room, and the distance from any point in the room to the nearest exit or door to an escape route should be no more than 25 m.

(5.2(7))
Rescue openings should be easy to identify, reach and use. Rescue openings cannot replace exits or escape routes.
way that people can make their presence known to the emergency services. They must also be formed such that people can be rescued via emergency services ladders or by themselves, unless the building is laid out as specified in 5.2(8).

(8) In a building in which the floor of the uppermost storey is more than 22 m above ground level, or in which not all rescue openings can be reached by emergency services ladders in accordance with 5.6.1(2), the design and fitting out of the building must make particular allowance for the evacuation of the building, the intervention time needed by the emergency services, and access to the storeys.

5.3 Structural factors

PROVISION

(1) Construction products and building elements must be constructed such that people in or near the building can be brought to safety at ground level in the open air or to a safe place in the building, and such that the emergency services are able to rescue people, make satisfactory arrangements for animals and carry out firefighting work.

(2) Building elements must be joined such that the entire structure is not inferior in fire-resisting terms to the requirements for the individual building elements in the structure.

(3) Building elements must be made in such a way that fire cannot spread from a fire-resisting unit to a cavity which passes one or more fire-separating building elements.

(4) In a building in which the floor of the uppermost storey is more than 22 m above ground level, the design of the load-bearing structures must take particular account of the evacuation of the building, of the intervention time needed by the emergency services and of access to storeys, the fire load etc.

5.4 Fire safety installations

PROVISION

(1) Fire safety installations must be built to be reliable and so that they can be inspected and maintained throughout their lifetime.

GUIDANCE

(5.4(1)-(2)) “Fire safety installations” means:
- An automatic fire alarm system is a system that detects a fire in its initial phase and subsequently sends an alarm to the emergency services. The system can also activate other fire safety installations.
- An automatic sprinkler system is a system which uses water to extinguish a fire in its initial phase or to control a fire until other fire-fighting measures are taken, and which issues an alarm to the emergency services. The system can also activate other fire safety installations.
- A warning system warns people in the building in the event of fire. Warnings using spoken messages should be used in usage category 3. If warnings using spoken messages would be inadequate given the use to which the building section is put, the spoken message may be replaced by a more appropriate alarm, for example a high-pitched tone.
- A smoke alarm system may consist of linked smoke alarms. The smoke alarm system in a building should only give an alarm in the fire-resisting unit, for example a dwelling, in which the smoke has been detected. Smoke alarm systems do not issue an alarm to the emergency services.
- Escape lighting consists of illuminated, backlit or fluorescent (self-lit) escape route signs at exit doors on escape routes. Escape lighting also covers lighting of floor areas on escape routes and in large premises. Self-lit signs may only be used where sufficient charge for the appropriate light level is assured.
- Panic lighting is that part of the emergency lighting that serves to prevent panic and provide lighting that enables people to reach a point where there is an escape route.
- The purpose of hose reels is to enable people without special fire extinguishing qualifications to fight a fire during its initial phase.

Other fire safety installations such as riser pipes, fire ventilation and smoke vents are also covered by 5.4(1) and (2).

(2) Fire safety installations must be inspected and maintained such that they remain reliable throughout the lifetime of the building.

(3) When applying the provisions of 5.4(7)(ii) 5.4(9)-(11) and 5.4(14)-(15), two or more building sections in the same usage category connected by a shared escape route are deemed to be one section.

(4) Building sections in usage category 1 must incorporate an automatic fire alarm system if the building section is used as an industrial or warehouse building and has a floor area of more than 2,000 m². If the building section has an automatic sprinkler system, an automatic fire alarm system may be omitted. This provision also applies to certain agricultural buildings used for livestock.

(5) Building sections in usage category 1 used as industrial or warehouse buildings must incorporate automatic sprinklers if the floor area is greater than 5,000 m². If these building sections have a high fire load, they must have automatic sprinkler systems if the floor area is more than 2,000 m². This provision does not apply to agricultural buildings.

(6) Building sections in usage category 1 used as industrial and warehouse buildings and agricultural buildings used for livestock must be provided with hose reels if the floor area is greater than 1,000 m².

(7) Car parks in usage categories 1 and 3 must be provided with:

(5.4(7)) See also section 5.4(8).
(i) independent mechanical ventilation that can remove explosive vapour and carbon monoxide if the floor area is greater than 150 m²;
(ii) have escape lighting and hose reels if the floor area is greater than 600 m²; and also panic lighting if the floor area is greater than 2,000 m²;
(iii) have automatic sprinkler systems if the floor area is greater than 2,000 m².

(8) Rooms in usage categories 1 and 3 with a floor area greater than 1,000 m² must incorporate an automatic fire ventilation system or an automatic sprinkler system.

(9) Building sections and associated escape routes in usage categories 2 and 3 designed for more than 150 people must be provided with warning systems. In building sections in which all occupiable spaces have doors leading directly to ground level in the open air, and in which there are no rooms/spaces designed for more than 150 people, warning systems may be omitted.

(10) Building sections for more than 150 people in usage category 2 must be provided with
   (i) hose reels
   (ii) Escape route lighting and panic lighting.
   Escape and panic lighting may be omitted from escape routes if all occupiable rooms have direct access to the outside at ground level.

(11) Escape routes designed for a total of more than 150 people in usage category 3 and in occupiable rooms/spaces for more than 150 people in usage category 3 must be provided with:
   (i) Hose reels
   (ii) Escape route lighting and panic lighting
   (iii) Warning system.

   The warning system must be established as an automatic warning system if the way in which the building section is used undermines its evacuation options. In building sections in which all occupiable rooms have doors leading directly to the outside at ground level, and in which there are no rooms/spaces designed for more than 150 people, escape and panic lighting may be omitted.

(12) Building sections in usage category 3 must incorporate an automatic sprinkler system if the building section has a total floor area greater than 2,000 m².

(13) Each residential unit in building sections in usage category 4 must have a smoke alarm system that is connected to the power supply and has battery backup.

(14) The ventilation system must comply with DS 428, Code for technical measures for fire protection in ventilation systems.

(5.4(8)) The purpose of this requirement is to ensure that the emergency services are given sufficient scope for intervention. This may be achieved by ensuring that a fire remains small, for example by limiting the spread using sprinklers, or, in the case of a fire ventilation system, by removing smoke and heat from the space/room.
In this context, a space/room need not be a fire-resisting unit.
This requirement may be deemed to have been satisfied in car parks with a floor area of between 1,000 m² and 2,000 m² if either automatic fire ventilation or automatic sprinkler systems are in place, and in car parks with a floor area greater than 2,000 m² - see 5.4(7) - if automatic sprinkler systems are in place.

(5.4(11)) An automatic warning system is one which is connected to an automatic fire alarm system and therefore enables the alarm to be activated by sensors and alarm buttons.
Factors which can undermine evacuation options include loud music, darkness, stage smoke, etc. The warning system should be connected to the music system, lighting system, etc.

(5.4(13)) At least one smoke alarm should be fitted in each dwelling, but at least one on each floor. Dwellings that have their own burners should also have a smoke detector installed in the room where the burner is placed. Smoke detectors should be interconnected. Fitting more than one smoke alarm in the dwelling permits the individual occupants to be given a quicker, more timely warning. It is important not to leave too great a distance between smoke alarms.
Building sections in usage category 5 and associated escape routes must be provided with:
(i) escape and panic lighting if the building section has a total floor area greater than 1,000 m².
(ii) hose reels.
(iii) warning systems and automatic fire alarm systems if the building section has more than 10 bedrooms or is designed for more than 50 bedspaces.
(iv) smoke alarm systems connected to the power supply and using battery backup if the building section has no more than 10 bedrooms or is designed for no more than 50 beds.
(v) hose reels, automatic fire alarm systems, escape and panic lighting and warning systems may be omitted.

(15)
Building sections in usage category 6 must be provided with:
(i) hose reels
(ii) automatic fire alarm systems, designed to give the alarm to staff.
(iii) automatic sprinkler system
a. if the building is higher than one storey and
b. has bedroom sections in usage category 6 with a total floor area greater than 1,000 m².

The system must have the facility for giving the alarm to staff.
(iv) Escape and panic lighting on escape routes if the building section has a total floor area greater than 1,000 m².

(5.4(15))
In the event of activation of a fire alarm system and/or automatic sprinkler system, the staff should also be alerted.
If the conditions under 5.4(15)(iii)a. and b. apply, the entire building must be provided with automatic sprinkler system. Accordingly, not only individual bedroom sections need to be provided with automatic sprinkler system. Other bedroom sections not comprised by usage category 6 are not included in the calculation of the area under 5.4(15)(iii)b.

(16)
Alarms from a warning system must be appropriate for the use and organisation of the building section. If the building is fitted with an automatic fire alarm system or an automatic sprinkler system, it must activate the warning system.

(17)
An automatic fire alarm system and an automatic sprinkler system must transmit an alarm to the emergency services.

(5.4(17))
An example showing when the provisions may be derogated from is a building section made subject to the structural fire design.

(18)
Installations in connection with tall buildings can for example include fire service lifts, warning systems, automatic fire alarm systems, automatic sprinklers, riser pipes, etc.

5.5 Spread of fire and smoke

PROVISION

(1)
Buildings must be built, laid out and fitted out such that a fire can be contained within the fire-resisting unit in which the fire started. The spread of fire and smoke to other fire-resisting units must be prevented for the period of time needed for evacuation and for the work of the emergency services.

(5.5(1))
A building may usefully be subdivided into several fire-resisting units to ensure that fire and smoke cannot spread throughout the building.

5.5.1 Spread of fire and smoke in the room in which the fire starts

PROVISION

(1)
Internal surfaces must be such that they do not contribute significantly to fire or to smoke emission during the period of time

(5.5.1(1))
Internal surfaces comprise wall and ceiling finishes and flooring. This provision also covers suspended ceilings,
needed to allow people occupying the room to reach safety.

sound-absorbing products, decorations, notice boards, electrical cables, pipe lagging and similar surfaces in significant quantities.

5.5.2 Spread of fire and smoke in the building in which the fire starts or to buildings on the same plot

PROVISION

(1) External surfaces and roofing must be built in such a way that they do not contribute significantly to the spread of fire.

(2) Building sections in different usage categories must comprise independent fire-resisting units. Building sections must be further divided to make escape routes as safe as possible, and to allow people occupying rooms with only one escape route to remain safe until rescue can be expected. A building section may comprise several usage categories if compliance with the safety level specified in 5.1(1) is satisfied.

(3) Service shafts, stairwells, lift shafts etc. that connect several fire-resisting units must be separated in fire resistance terms from other parts of the building.

(4) Penetrations for services in fire-separating building elements must be sealed such that the fire-resisting properties of the compartmentations are not impaired.

5.5.3 Spread of fire to buildings on other plots

PROVISION

(1) Buildings must be sufficiently far from boundaries to neighbouring properties, road or path or must be so built as to eliminate the risk of the spread of fire to buildings on other plots.

GUIDANCE

(5.5.3(1)) Note that the external surfaces of the building also have implications in terms of the risk of spread of fire to buildings on other plots. This provision also applies to agricultural buildings.

5.6 Access for the emergency services

PROVISION

(1) Buildings must be located on the plot and laid out in such a way as to give the emergency services sufficient scope for firefighting and rescuing people and animals. Access must be provided to the building itself and to its plot for the necessary fire appliances to rescue people and animals.

GUIDANCE

(5.6(1)) The appropriate firefighting and rescue appliances are determined by the location, design, layout and use of the building. Buildings in which people assemble in large numbers and buildings used for activities involving a high risk of fire or for the storage of flammable items are subject to current legislation in respect of emergency planning. The basic premise of the provisions of the Danish Building Act is the safety of people and animals. These provisions are therefore designed to ensure the means of evacuating people and acceptable arrangements for rescuing animals, as expressed in the provisions of the Building Regulations.

5.6.1 Access and facilities for the emergency services

PROVISION

(1) Unobstructed access for the emergency services to the building must be provided.

GUIDANCE

(5.6.1(1)-(3)) The design and layout of fire rescue areas and vehicular access should, inter alia, take account of the surfacing and slope of the area and their location relative to the building, with the aim of ensuring the best possible working conditions for the emergency services.
It must be possible for the emergency services to bring ladders to the rescue openings. In buildings where the rescue openings can only be reached by the emergency services' motorised ladders, fire rescue areas must be built and located such that the motorised ladders can reach all rescue openings. Buildings erected in accordance with 5.2(8) are not covered by this provision.

Buildings must be designed so as to enable the emergency services to take firefighting and rescue appliances to all parts of the building as appropriate. If hoses cannot be brought in via primary access routes such as staircases etc., riser pipes must be installed.

### 5.6.2 Smoke venting

**PROVISION**

1. The facility must be in place for smoke to be vented from the emergency services' primary access routes.

2. In building sections where smoke venting cannot be made by natural ventilation through windows in external walls or hatches in the roof, smoke venting must be established in some other way.

**GUIDANCE**

1. The emergency services' primary access routes are normally the escape staircases.

The function of smoke venting is to give the emergency services the means of injecting cold smoke as part of a firefighting intervention. Examples of sections in which it may be necessary to establish smoke venting, are basements, shafts and roof spaces. Venting must be provided for the section as a whole, for example in the form of cross-venting by means of openings at opposite ends of the section. Individual rooms do not necessarily have to be fitted with the means of venting smoke directly out into the open air. An alternative to natural ventilation may be mechanical smoke venting.

### 6. Indoor climate

#### 6.1 General

**PROVISION**

1. Buildings must be constructed such that, under their intended operational conditions, a healthy, safe and comfortable indoor climate can be maintained in rooms occupied by any number of people for an extended period.

**GUIDANCE**

1. Satisfactory health conditions in relation to buildings also include comfort and wellbeing.

The structural part of the indoor climate covers thermal conditions (6.2), air quality (6.3), acoustic indoor climate (6.4) and light conditions (6.5). See SBI Guidance Note 196, *Indeklimahåndbogen* [The Indoor Climate Handbook]. As far as the thermal indoor climate is concerned, the planning of buildings and the choice of materials, window areas, cooling options, orientation and solar screening must ensure that satisfactory temperature conditions are achieved, even in summertime.

Air quality is first and foremost determined by the ventilation achieved and by indoor pollution, including moisture production caused by the behaviour of the users. Building materials with the lowest possible emissions of pollutants should always be used.

As far as acoustic indoor climate is concerned, the structures must be designed and built such that they provide sufficient sound insulation between adjoining rooms and take external noise sources into account.

Finally, satisfactory acoustic conditions in individual rooms require that the materials used for the surfaces in the rooms provide sufficient sound absorption to ensure the necessary sound attenuation.

With respect to light conditions, there should be an appropriate relationship between window sizes, room proportions and surface properties, taking the outdoor views into account. It is also important that the other factors which create the right visual environment should be suitable, which includes the facility for adjusting the...
lighting to suit the tasks carried out in the room. With respect to risk of personal injury from electromagnetic radiation, building legislation contains no specific regulations, as they are not considered necessary. The problem is considered to be adequately addressed by other legislation. There may, however, be particular circumstances of which a client should be aware when making structural alterations, for example when installing a roof terrace in the immediate vicinity of an existing mobile phone mast. In cases of doubt, the client should contact the operators of the mobile phone mast.

(2) Agricultural buildings are exempt from the requirements in respect of the indoor climate. The exemption does not apply to rooms/spaces where employees carry out ordinary commercial activities.

6.2 Thermal indoor climate

PROVISION

(1) Buildings must be constructed such that, during the intended use of the buildings, a comfortable, healthy thermal indoor climate can be maintained in the rooms occupied by any number of people for an extended period considering the human activity in the rooms.

GUIDANCE

(6.2(1)) Thermal indoor climate is determined by the temperature of the air and surfaces and the velocity and turbulence intensity of the air and to a lesser degree the humidity of the air. It is possible to determine thermal comfort based on the relationship between thermal indoor climate and human activity and clothing. For functional requirements and methods of specification, verification and monitoring of the thermal indoor climate, see DS 474, Code for thermal indoor climate. See also DS/EN ISO 7730, Ergonomics in the thermal environment – Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria. For buildings other than dwellings, the client determines the maximum number of hours per year during which an indoor temperature of 26°C and 27°C, respectively, may be exceeded. For buildings where windows can be opened to create ventilation, the provision is usually observed when, by calculation, it can be documented that the indoor temperature exceeds 27°C for no more than 100 hours per year and for no more than 25 hours per year, the temperature exceeds 28°C. See also 6.3.1.1(3) concerning draughts.

(2) For dwellings, institutions, offices, etc. the thermal indoor climate on sunny days must be documented by calculation.

6.3 Air quality

6.3.1 Ventilation

6.3.1.1 General

PROVISION

(1) Buildings must be ventilated. Ventilation systems must be designed, built, operated and maintained so as to achieve satisfactory air quality and humidity conditions while they are in use.

GUIDANCE

(6.3.1.1(1)) Ventilation may be by systems for natural ventilation, mechanical or hybrid ventilation. "Ventilation systems" refers to natural ventilation, hybrid and mechanical ventilation. "Ventilation installations" refers only to mechanical ventilation, including the mechanical part of hybrid ventilation. Ventilation systems must be built in accordance with 8.3. 8.3. The ventilation requirements also apply in connection with comprehensive renovations or changes in use in existing
buildings. For minor renovation tasks such as replacement of windows, it must be ensured that the ventilation conditions of the building at the time of erection are maintained. In connection with the replacement of windows in a dwelling, this may be accommodated by using fresh air vents. The provisions on ventilation only address general ventilation needs. Additional ventilation may be needed in working areas, for example, or rooms in a dwelling used for commercial activity. In such cases, requirements for additional ventilation apply pursuant to the Danish Working Environment Act. Provisions which address health-related factors, such as the ventilation provisions, must be complied with throughout the lifetime of the building. Dwellings are normally deemed to be in use round the clock. See also DS 447 Ventilation for buildings - Mechanical, natural and hybrid ventilation systems; DS/EN ISO 7730 Ergonomics in the thermal environment – Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria; and WEA Guideline A. 1.2 Indeklima [Indoor climate] issued by the Danish Working Environment Authority.

For ventilation of rooms with heat producing appliances, see Part 8 and section A of the Danish Gas Regulations. Cleaning standards in a room have a significant impact on air quality. See Executive Order on the Conditions at Permanent Places of Work.

(2) Fresh air must be provided through openings direct to the external air or by ventilation installations with forced air supply and preheating of the intake air.

(3) The supply and removal of air must ensure that draughts do not arise during the heating season in rooms which are occupied by any number of people for extended periods.

(4) Transfer of air from one room to another must not be from more to less air-polluted rooms.

(5) Ventilation systems and ventilation openings directly to the external air must be designed and installed such that they do not transfer...
substances to the ventilated rooms, including micro-organisms, which render the indoor climate unhealthy.

6.3.1.2 Domestic buildings

PROVISION

(1) Each habitable room, as well as the dwelling as a whole, must have a fresh air supply of no less than 0.3 l/s per m² of heated floor area.

(2) Kitchens must be provided with extractor hoods with exhaust ventilation above the hotplates. The extractor hood must have adjustable, mechanical extraction and vents to the external air and be sufficiently efficient to trap damp and gaseous pollutants from food preparation. It must be possible to increase the extraction to at least 20 l/s.

(3) The background air changes in the housing unit must be provided by a ventilation system with heat recovery which preheats the intake air, forced air supply in habitable rooms and extractors from bathrooms, sanitary accommodations, kitchens and utility rooms. In summer, air supply may be replaced by fresh air supply through windows, fresh air vents and the like.

(4) It must be possible to increase extraction in kitchens, bathrooms, sanitary accommodations, utility rooms and similar rooms to no less than the following: Extraction of at least 15 l/s must be possible from bathrooms and sanitary accommodations. Extraction of a flow of at least 10 l/s must be possible from separate sanitary rooms, utility rooms and basement.

(5) Demand-controlled ventilation may be used provided that the fresh air supply by this means will not be lower than 0.3 l/s per m².

(6) Single-family houses may be ventilated by natural ventilation. 6.3.1.2(1) and (2) apply to single-family houses with natural ventilation.

GUIDANCE

(6.3.1.2(1)) The floor area must be calculated in accordance with the rules specified in Appendix 1. Basements must also have ventilation.

(6.3.1.2(2)) Hotplates may be electricity or gas heated and be built into a cooker.

(6.3.1.2(3)) In summer, additional ventilation may be needed to remove surplus heat. This ventilation may be natural, mechanical or hybrid ventilation. In the case of conversions, the provisions of 6.3.1.2(3) may be relaxed if the local council is satisfied that the conversion work cannot be carried out without extensive alterations to the building. A relaxation of 6.3.1.2(3) may, for example, be provision of background air change by means of extractors in the bathroom and kitchen supplemented with fresh air supply through the facade, windows or the like, where, for construction reasons or due to space constraints, it may be difficult to establish mechanical forced air supply. This does not imply relaxations of the background air change requirement.

(6.3.1.2(4)) The increased flow required will often involve a higher overall air change in the dwelling than the required background air change of 0.3 l/s per m².

(6.3.1.2(5)) Demand control in dwellings will normally consist of control according to moisture conditions. Demand control may, for example, also include a manually operated extractor hood. The extraction from bathrooms and sanitary rooms should always be at least 10 l/s.

(6.3.1.2(6)) Single-family houses which include holiday homes, semi-detached, terraced, cluster, linked houses etc., are buildings comprising one dwelling, where separation is not achieved by horizontal party walls. Natural ventilation functions by air being supplied via valves in external walls and removed via natural updraught through exhaust ducts from kitchens and bathrooms/WC above the roof. Supply of fresh air in habitable rooms: Opening window, hatch or external door and one or more fresh air vents with a total unobstructed opening of no less than 60 cm² per 25 m² room floor area. The opening area to the external air may be determined on the basis of ventilation engineering calculations. Supply of fresh air in kitchens: Opening of no less than 100 cm² onto an access space and an opening window, hatch or external door. Supply of fresh air in bathrooms and sanitary accommodations: Opening of no less than 100 cm² onto an access space.
(7) For rooms other than those listed in 6.3.1.2(1)-(6), the approval by the local council is required for the design of the ventilation, taking account of the size and use of the room.

6.3.1.3 Buildings other than domestic buildings

PROVISION

(1) Occupiable rooms in day-care centres must be ventilated by ventilation systems comprising both forced air supply and extraction and heat recovery which preheats the intake air. Fresh air supply and extraction must be no less than 3 l/s per child and no less than 5 l/s per adult plus 0.35 l/s per m² floor area. At the same time, it must be ensured that the CO₂ content of the indoor air does not exceed 0.1% CO₂ for extended periods. If a ventilation system with demand-controlled ventilation is used, the specified air volumes may be deviated from when demand is reduced. The ventilation during the hours of use may, however, not be less than 0.35 l/s per m² floor area.

(2) Teaching rooms in schools etc. must be ventilated by ventilation systems comprising both forced air supply and extraction and heat recovery which preheats the intake air. In normal classrooms, fresh air supply and extraction must be no less than 5 l/s per person plus 0.35 l/s per m² floor area. At the same time, it must be ensured that the CO₂ content of the indoor air does not exceed 0.1% CO₂ for extended periods. If a ventilation system with demand-controlled ventilation is used, the specified air volumes may be deviated from when demand is reduced. The ventilation during the hours of use may, however, not be less than 0.35 l/s per m² floor area. Where special constructional allowances are in place, for example greater room volumes per person, use of several extraction options, including cross-ventilation options, the requirement for mechanical ventilation may be waived provided that a comfortable and healthy indoor climate is maintained.

(3) For rooms other than those listed in 6.3.1.3(1) and (2), the approval by the local council is required for the design of the ventilation, taking account of the size and use of the room.

In addition, if the room comprises an external wall, it must have an opening window, hatch or external door. Removal of indoor air in bathrooms and sanitary accommodations:

- Exhaust duct with a cross section of no less than 200 cm².
- Supply of fresh air in basements:
  - Supply of fresh air through one or more fresh air vents.
  - Removal of indoor air from at least one basement room via an exhaust duct with a cross section of no less than 200 cm².

GUIDANCE

(6.3.1.3(1)-(3))

7.2.5.1(11) on requirements for the CO₂ content of air applies in respect of optional building class 2020.

(6.3.1.3(1))

This applies, for example, to day-care centres such as day nurseries, kindergartens, school-based day-care facilities and other after-school facilities, day centres and other institutions with similar purposes.

The ventilation rate for the occupiable rooms is not in itself sufficient under all conditions to ensure that the CO₂ content of the indoor air does not exceed 0.1% CO₂ for extended periods. The ventilation system should therefore be fitted with variable output depending on the load, so that the air change rates are higher in the rooms that are most heavily loaded and less in the rooms with less demand.

The ventilation rate for the building is specified on the basis of the assumption that low pollutant-emitting building materials are used. "Low pollutant-emitting building materials" means building materials covered by the Danish Indoor Climate Labelling scheme and materials which comply with the conditions for labelling in accordance with the scheme. This provision must be read in conjunction with 3.4.2(2). The room floor area measured is the floor area.

(6.3.1.3(2))

The ventilation rate for the normal classrooms is not in itself sufficient under all conditions to ensure that the CO₂ content of the indoor air does not exceed 0.1% CO₂ for extended periods. The ventilation system should therefore be fitted with variable output depending on the load, so that the air change rates are higher in the rooms that are most heavily loaded and less in the rooms with less demand.

The ventilation rate for the building is specified on the basis of the assumption that low pollutant-emitting building materials are used. "Low pollutant-emitting building materials" means building materials covered by the Danish Indoor Climate Labelling scheme and materials which comply with the conditions for labelling in accordance with the scheme. This provision must be read in conjunction with 3.4.2(2). The area measured is the floor area.

(6.3.1.3(3))

Note that natural ventilation may be sufficient in certain cases, but in other cases hybrid or mechanical ventilation should be stipulated in order to achieve a comfortable and healthy indoor climate. Rooms in which ventilation needs can be met by natural ventilation may include offices, hotel rooms and certain types of shop premises. Rooms which
require special consideration in respect of natural ventilation and which may require hybrid or mechanical ventilation might include office space for many people, assembly rooms, meeting rooms, canteens, restaurants and hospital rooms or wards. The capacity of the ventilation may, for example, be determined on the basis of DS 447 Ventilation for buildings – Mechanical, natural and hybrid ventilation systems. For ventilation in refuse rooms and lifts, see Part 8.

6.3.2. Emissions from building materials

6.3.2.1 General

PROVISION

(1) Building materials must not emit gases, vapours, particles or ionising radiation that may result in an unhealthy indoor climate.

GUIDANCE

(6.3.2.1(1)) Building materials with the lowest possible emissions of pollutants to the indoor climate should always be used. A labelling scheme for construction products, the Danish Indoor Climate Labelling scheme, has been set up; see www.teknologisk.dk/dim.

6.3.2.2 Formaldehyde

PROVISION

(1) Wood-based sheets or panels, suspended ceilings and other construction products containing substances that emit formaldehyde may only be used if the emission of formaldehyde does not give rise to an unhealthy indoor climate.

GUIDANCE

(6.3.2.2(1)) This provision covers construction products containing formaldehyde-emitting substances and therefore not construction products that are glued using products such as PVA, phenol, resorcinol or isocyanate glues without the addition of urea formaldehyde. Construction products containing formaldehyde-emitting substances which are in contact with the indoor climate and are covered by a harmonised standard, must be CE marked and the CE marking must show that the construction product is covered by class E1. When using timber sheets or panels glued with formaldehyde-emitting glues for floors, walls and ceilings, such as MDF and chipboard sheets, covering the sheets with a non-formaldehyde-emitting material is recommended, to minimise the quantity of formaldehyde in the indoor air. The covering could, for example, be plasterboard, roll flooring, timber floors or other flooring. "Wood-based sheets or panels" means sheets or panels defined in DS/EN 13986 Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking or similar sheets or panels containing formaldehyde-emitting glue. WHO recommends that the total formaldehyde content of indoor air should not exceed 0.1 mg/m³.

6.3.2.3 Asbestos

PROVISION

(1) Materials containing asbestos are not to be used.

GUIDANCE

(6.3.2.3(1)) The use of asbestos is universally prohibited; see the Executive Order on Asbestos and WEA Guideline C.2.2 Asbest [Asbestos]. See also SBI Guidelines 228 Asbest i bygninger [Asbestos in buildings] and SBI Guidelines 229 Byggematerialer med asbest [Building materials containing asbestos].

6.3.2.4 Mineral wool

PROVISION

(1) Mineral wool-containing materials with surfaces which are in contact with the indoor climate must be installed in a safe manner,
and the materials used must be durable and fit for purpose, such that they do not emit mineral wool fibres into the indoor climate.

6.3.2.5 Fly ash and slag from coal firing

PROVISION

(1) Fly ash and slag from coal firing, used as a base for building, must be covered with a layer of gravel or similar, no less than 0.20 m deep and with a weight of 300 kg/m².

GUIDANCE

(6.3.2.5(1)) The waste from coal firing, for example from power stations, may contain radioactive substances from the coals which emit gamma radiation. The indoor radiation contribution from a base comprising such material can be reduced by covering it, for example, with a gravel layer. The base must not cause damp problems to the structure.

6.3.3 Other pollutants

6.3.3.1 Nitrogen oxides

PROVISION

(1) Nitrogen oxides emitted to the indoor climate from combustion in cookers, central heating boilers etc. must be restricted by the removal of the flue gases.

GUIDANCE

(6.3.3.1(1)) In the case of kitchens, this requirement will normally be met by the requirements stipulating an extractor hood; see 6.3.1.2(2). See also the Danish Gas Regulations.

6.3.3.2 Radon

(1) Ingress of radon to the indoor climate must be limited by making the structure which is in contact with the subsoil airtight or by using other measures to equal effect.

(2) The building must be constructed to ensure that the radon content does not exceed 100 Bq/m³.

GUIDANCE

(6.3.3.2(1)) Radon is a radioactive gas found in the soil. Radon must be prevented from entering buildings by making foundations, ground slabs, floors, basement floors and basement external walls airtight, for example by forming the structures of carefully placed concrete to achieve a good, uniform and crack-free structure, and by sealing pipe and duct penetrations through these building elements. See Byggeteknisk Erfaringsformidling, BYG-ERFA blad SfB (99) 15 01 02 Radonsikring nye bygninger [Construction Experience Sharing, BYG-ERFA paper SfB (99) 15 01 02 Radon-proofing of new buildings], and www.radonguiden.dk

The Danish Energy Agency makes the following recommendations for radon in the indoor climate in existing buildings: International recommendations are that a national reference level for existing dwellings between 100 and 300 Bq/m² should be adopted. On this basis, the Danish Energy Agency recommends that simple and cheap improvements be made to existing buildings when the radon level is between 100 Bq/m³ and 200 Bq/m³, and that more effective measures be taken when the radon level exceeds 200 Bq/m³.

(6.3.3.3(2)) If radon is to be measured, the measurements should be taken over at least two months in the heating season, and the measurements should result in a calculated mean radon concentration over the entire year – the mean annual value for the house. See also the Danish Health Authority, www.sundhedsstyrelsen.dk/da/sundhed/straalebeskyttelse/ radon.

6.3.3.3 Other pollution from the subsoil

PROVISION

GUIDANCE
Pollution from former refuse tips, gas works, polluted industrial sites etc., resulting in an unhealthy or unsafe indoor climate is not to be permitted. Should the plot be developed without full prior remediation of pollution in the soil, the influx of soil pollution to the indoor climate must be limited by ensuring that the structure which is in contact with the subsoil is airtight and impermeable or by using other measures to equal effect. In exceptional cases, where the plot, prior to construction work, is not remediated, partly for the protection of the groundwater and the upper layers of the subsoil, the local council may impose further requirements.

6.4 Acoustic indoor climate

6.4.1 General

PROVISION

(1) Buildings must be planned, designed, built and fitted out so as to ensure satisfactory sound conditions for the users.

6.4.2 Domestic and other buildings used for overnight accommodation

PROVISION

(1) Domestic and similar buildings used for overnight accommodation, and ancillary services, must be designed such that those who occupy the buildings are not subjected to noise nuisance from rooms in adjoining residential and commercial units, from the building services or from nearby roads and railways.

(6.3.3.3(1))

Soil pollutants can seep up into buildings by convection and diffusion through foundations, ground slabs, floors, basement floors and the external basement walls. Convection can be prevented by making the structure airtight, for example by careful construction in concrete to achieve a good, uniform and crack-free structure. Diffusion can be reduced by making the structure diffusion-proof, for example by using a moderate grade eco-friendly concrete with a content of no more than 5% of porous particles. See DS/EN 1992-1-1, Design of concrete structures. See also the Soil Pollution Act and its requirements for outdoor areas.

GUIDANCE

(6.4.1(1))

Definitions and concepts with regard to airborne sound insulation, impact sound and sound pressure levels are set out in DS 490 Sound classification of dwellings. The concepts of reverberation time and absorption area are also used, as defined in DS/EN 12354-6, 2004 Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 6: Sound absorption in enclosed spaces.

Check measurements of sound conditions must be made in accordance with SBi Guidelines 217 Udførelse af bygningsakustiske målinger [Performing building acoustics measurements].

Regulations on sound conditions and noise are also set out in executive orders, guidance notes and guidelines issued by the Danish Working Environment Authority and the Danish Environmental Protection Agency.

GUIDANCE

(6.4.2(1)-(4))

"Domestic buildings" in this context also includes hotels, student halls of residence/dormitories, boarding houses, inns, bedsits, boarding schools, sheltered housing, residential childcare institutions and similar buildings used for overnight accommodation.

The functional requirement for residential buildings is deemed to be met if they are built as class C in DS 490 Sound classification of dwellings. For the limit values of the above standard for traffic noise indoors, the following applies for compliance with the functional requirement: The limit value applies to buildings along roads and railways where the traffic intensity generates a noise level at any individual building of more than 58 dB for roads and 64 dB for railways. The limit value is expressed as the Lden value. The limit value applies separately to roads and railways.

In the case of domestic buildings, the functional requirement for the noise level indoors in habitable rooms generated by building services in commercial units in the same building is deemed to be met if the noise level does not exceed values corresponding to the guideline limit values specified in Table III of Guidance no. 5/1984 issued by the Danish Environmental Protection Agency.

Proposed limit values for low frequency noise and infrasound in habitable rooms are set out in Environmental Review No. 9/1997 from the Danish Environmental Protection Agency.

The functional requirement for noise levels outdoors from
building services is deemed to be met if the noise level does not exceed values corresponding to the guideline limit values for the night-time period specified in Table I of Guidance no. 5/1984 issued by the Danish Environmental Protection Agency. The recommended limit values apply within the building’s own plot and in respect of adjacent buildings.

DS 490, Sound classification of dwellings, also contains limit values for dwellings whose quality in terms of noise exceeds the minimum requirements of the Building Regulations – class B and class A.

(2) If rooms with particularly intrusive noise levels adjoin domestic buildings and common space, individual sound insulation measures must be taken.

(3) Building services must not create uncomfortable noise levels immediately outside the windows of the buildings or in recreational areas, including balconies, roof terraces, outdoor spaces etc.

(4) The reverberation time in common spaces must be adjusted to suit their use.

(5) Only the above noise requirements for building services and traffic apply to rooms in detached single-family houses.

(6) Only the above noise requirements for building services apply to holiday homes in designated “summer house” areas.

6.4.3 Buildings other than domestic buildings etc.

PROVISION

(1) Buildings and their services must be designed so as to limit noise nuisance from adjoining rooms, from the building services of the building and from nearby roads and railways. This must be to the extent required for the planned use of the buildings and such that the occupants of the buildings are not subjected to noise nuisance.

(2) If rooms with particularly high noise nuisance limits adjoin teaching rooms or occupable rooms, separate sound insulation measures must be taken.

(3) The reverberation time in rooms in buildings must be adjusted to suit the use of the rooms.

GUIDANCE

(6.4.3(1)-(3)) Buildings other than domestic buildings include educational and day care buildings. Educational buildings include primary and secondary schools, educational institutions, universities etc. Day care buildings include childcare facilities, school-based day-care facilities, etc.

The functional requirement for the above types of buildings is deemed to be met if they are constructed in accordance with the Danish Energy Authority's Guidelines on sound requirements set out in the Danish Building Regulations 2010 (Acoustic indoor climate).

In the case of buildings for other purposes, project-specific noise provisions should be determined in each individual case to comply with the requirements for the acoustic indoor climate.

(6.4.3(2)) For teaching rooms or occupable rooms in childcare institutions in buildings in which there are rooms with noisy activities in commercial units or other educational institutions or day nurseries in the same or adjoining buildings, the functional requirement is deemed to be met if the building is built in compliance with the Danish Energy Authority's Guidelines on sound requirements set out in the Danish Building Regulations 2010 (Acoustic indoor climate).

(6.4.3(3)) The requirement is deemed to be met if the building is constructed in accordance with the Danish Energy Authority's Guidelines on sound requirements set out in the Danish Building Regulations 2010 (Acoustic indoor climate).
6.5 Lighting conditions

6.5.1 General

PROVISION

(1) Workrooms, occupiable rooms, habitable rooms and shared access routes must have satisfactory lighting without causing unnecessary heat loads.

(2) Workrooms, etc. must be fitted with windows providing those in the rooms with a view of the surroundings.

6.5.2 Daylight

PROVISION

(1) Workrooms, occupiable rooms in institutions, teaching rooms, dining areas, hereinafter referred to as "workrooms etc.", and habitable rooms and kitchens must have sufficient daylight for the rooms to be well lit. Windows must be made, located and, where appropriate, screened such that sunlight through them does not cause overheating in the rooms, and such that nuisance from direct solar heat gain is avoided.

GUIDANCE

(6.5.1(1)) Satisfactory lighting must be assessed in the context of the activities and tasks intended to be carried out in the room.

(6.5.1(2)) The view of the surroundings is one of most important factors in the experience of the room. Workrooms etc. and habitable rooms that are primarily illuminated via rooflights must always be fitted with windows in walls to provide views of the surroundings.

(2) Derogation from this requirement for daylight access is possible if compliance would be materially detrimental to the operation of the commercial activity, for example where the nature of the Authority’s Guidelines on sound requirements set out in the Danish Building Regulations 2010 (Acoustic indoor climate).
production does not permit daylight.

6.5.3 Electric lighting

PROVISION

(1) Workrooms, etc. and shared access routes must have artificial lighting as necessary.
Workspace lighting must be in accordance with DS/EN 12464-1 Light and lighting – Lighting of work places – Part 1: Indoor work places, with DS/EN 12464-1 DK NA.

(2) Workrooms, etc. and shared access routes must be provided with energy-efficient lighting. If there is sufficient daylight, workrooms, etc. and shared access routes must be fitted with automatic daylight control.

(3) Workrooms, etc. with occasional usage and shared access routes must be provided with movement sensors. The use of movement sensors may be omitted if switching off a light may lead to a risk of accidents, or if the luminaires are not suitable.

(4) Lighting systems in workrooms, etc. must be divided into zones and be available for use as appropriate according to daylight conditions and activities.

(5) The provisions of 6.5.3(1)-(4) may be deviated from if compliance would seriously hinder the operation of the enterprise.

(6) The provisions of 6.5.3(1)-(5) also apply when replacing fittings etc. in existing working rooms.

7. Energy consumption

7.1 General

PROVISION

(1) Buildings must be constructed so as to avoid unnecessary energy consumption for heating, hot water, cooling, ventilation and lighting while at the same time achieving healthy conditions.
The same applies to conversions and any other significant alterations to buildings covered by 7.4.

GUIDANCE

(6.5.3(1))
See also DS/EN 12464-2 Light and lighting – Lighting of work places – Part 2: Outdoor work places, DS/EN 12665 Light and lighting – Basic terms and criteria for specifying lighting requirements, DS/EN 1838 Lighting application – Emergency lighting, DS/EN 50172 Emergency escape lighting systems and DS/EN 12193 Light and lighting – Sports lighting.

(6.5.3(2) and (3))
Energy-efficient lighting partly means the use of luminaires with an efficiency for general lighting of over 50 lm/W and for effect lighting and working lamps of over 15 lm/W.
Daylight control may be omitted in rooms with limited daylight entry.

(6.5.3(3))
This provision also applies to bathrooms and rooms containing sanitary conveniences associated with workrooms, etc. In, for example, warehouses where trucks are used, movement sensors may constitute a risk of accidents. Energy-efficient light sources such as vapour lamps are not suitable for daylight control or the use of movement sensors.

(6.5.3(4))
Zoning ensures the provision of the means of limiting the period of usage as far as possible. This provision means, for example, that light fittings near windows could form one zone, while fittings located within the room form one or more discrete zones. This provision can be complied with by installing manual and/or automatic switches for each zone.

(7.1(1))
7.2 applies to new buildings with the exception of holiday homes.
7.3 covers change of use of existing buildings and new extensions to existing buildings.
7.4 covers conversions of and alterations to existing buildings.
7.5 covers new holiday homes, extensions and alterations to existing holiday homes.
7.6 covers minimum requirements for the individual building elements in new buildings or change of use and extensions to existing buildings and holiday homes.
See SBI Guidelines 213 Bygningers energibehov [Energy demands of buildings].
Regulations on certification of the energy performance of new buildings and certification of conversions can be found in the relevant executive order issued by the Danish Energy Authority.
### 7.1 Energy performance frameworks for new buildings

#### 7.1.1 General

<table>
<thead>
<tr>
<th>Provision</th>
<th>Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(2)</strong></td>
<td>Any cold bridges in building elements which face the outside, including windows and doors, must be insignificant. The energy implications of cold bridges must be factored into calculations of heat loss from each building element.</td>
</tr>
<tr>
<td><strong>(3)</strong></td>
<td>Buildings and building elements, including windows and doors, must be built such that the heat loss is not significantly increased as a result of moisture, wind or unintended passage of air.</td>
</tr>
<tr>
<td><strong>(4)</strong></td>
<td>Heat loss through building elements in buildings heated to a minimum of 5°C must comply with the provisions of 7.6.</td>
</tr>
<tr>
<td><strong>(5)</strong></td>
<td>Building elements limiting rooms/spaces which are subjected to significant waste heat, such as boiler houses and bakeries, or which are only briefly, if ever, heated to above 5°C, must be thermally insulated as appropriate for their function.</td>
</tr>
<tr>
<td><strong>(6)</strong></td>
<td>The calculation of transmission areas, transmission loss and heat loss framework must use the DS 418 Calculation of heat loss from buildings.</td>
</tr>
<tr>
<td><strong>(7)</strong></td>
<td>In new buildings and in existing buildings, where significant conversions or alterations are made, part of the total energy supply to the building must be renewable energy if this is technically possible and financially viable; see 7.4.</td>
</tr>
<tr>
<td><strong>(7.1(2))</strong></td>
<td>This provision helps to minimise the risk of condensation and the growth of mould, and to limit heat loss through the individual building elements. This provision may be disregarded as far as handles and locks on windows and doors are concerned. See also 4.5(2) on moisture and durability.</td>
</tr>
<tr>
<td><strong>(7.1(3))</strong></td>
<td>Entrances to hotels, large shop premises and access to heated stairwells should normally be fitted with a storm porch. Thermal insulation subject to wind loading should be covered with a windproof material.</td>
</tr>
<tr>
<td><strong>(7.1(5))</strong></td>
<td>Building elements in rooms/spaces where temperatures are high must be insulated in order to achieve comfortable conditions. Insulation of buildings which are heated for a short duration must be based on a cost-benefit analysis or comfort considerations.</td>
</tr>
<tr>
<td><strong>(7.1(6))</strong></td>
<td>The insulation properties of materials must be determined in accordance with relevant DS/EN standards.</td>
</tr>
<tr>
<td><strong>(7.1(7))</strong></td>
<td>Significant conversions and alterations mean comprehensive building works and major renovation according to EU Directive 2009/28/EC, and in this context, significant conversions and alterations are therefore renovations involving a large share of the building envelope and simultaneous replacement of boiler or burner. If the building has electric heating, renewable energy must be introduced if a major part of the building envelope undergoes renovation. District heating supply satisfies this provision. Renewable energy may be wind power, solar or geothermal energy, and heat pumps also meet the requirement. The proportion of renewable energy in the electricity supply cannot be included. This provision does not apply to renovation of churches, listed buildings and buildings worthy of preservation; see 7.4. Local plans, town planning by-laws, etc. may prevent the installation of certain types of renewable energy systems. In such cases, the installation of such renewable energy systems is not covered by the requirement.</td>
</tr>
<tr>
<td><strong>(7.1(8))</strong></td>
<td>This exemption applies to commercial hothouses/greenhouses. However, the exemption does not apply to sales areas, offices or communal spaces.</td>
</tr>
</tbody>
</table>

#### 7.2 Energy performance frameworks for new buildings

**7.2.1 General**

<table>
<thead>
<tr>
<th>Provision</th>
<th>Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(9)</strong></td>
<td>Holiday homes are not covered by the provisions of 7.1(7), 7.2, 7.3, 7.4 and 7.6(2)-(4). Unheated buildings or buildings heated to below 5°C are not covered by 7.2-7.6.</td>
</tr>
</tbody>
</table>
The energy performance framework covers the total requirements of the building for supplied energy for heating, ventilation, cooling, domestic hot water and, where appropriate, lighting. Energy provided by different types of energy supply must be weighted. Appendix 6, containing design assumptions, must be used to demonstrate compliance with the energy performance framework.

"Supplied energy" means purchased energy supplied to the property, for example in the form of natural gas, oil, district heating, district cooling, groundwater cooling, electricity or biomass. As buildings normally have several types of energy supply, the total weighting is as stated in Appendix 6.

Buildings may be erected in accordance with the energy performance frameworks in 7.2.2 or 7.2.3, or as a voluntary low-energy building according to building class 2020; see 7.2.4.

Buildings must be designed such that the energy demand pursuant to 7.2.1(1) does not exceed the energy performance framework set out in 7.2.2 and 7.2.3. Verification must be on the basis of SBi Guidelines 213 Bygnings energibehov [Energy demands of buildings].

The calculation of the energy demand must take account of the envelope of the building, the location and orientation of the building, including daylight and outdoor climate, the heating system and hot water supply, the heat-accumulating properties of the building, ventilation systems, cooling using fresh air, any mechanical cooling, sunlight entry and solar screening and the planned indoor climate. Lighting must also be included in the energy demand of buildings covered by 7.2.3.


In mixed-use buildings to which different energy performance frameworks apply, the overall heated floor area of the building must be subdivided into building sections with the same usage. This subdivision must be used to determine the energy performance framework for the whole building.

Volume flow through leaks in the building envelope must not exceed 1.0 l/s per m² of the heated floor area at a pressure differential of 50 Pa. For buildings with high ceilings, in which the surface area of the building envelope divided by the floor area is greater than 3, the volume flow through leaks may not exceed 0.3 l/s per m² of the building envelope.

For floor areas where pressure testing of the volume flow through leaks are performed, the test result may be used to calculate the energy demand. If there is no documentation, 1.5 l/s per m² at 50 Pa must be used.

The provisions of 7.2.1(4) and (5) do not apply to buildings heated to below 15°C, change of use, extensions to existing buildings and renovation.

Insulation of individual building elements in the building envelope must be at least on a par with the values stated in 7.6.

Buildings covered by the provisions of 7.2.2 or 7.2.3 must be built such that the design transmission loss does not exceed 4.0 W per
m² of the building envelope in the case of single-storey buildings, 5.0 W for two-storey buildings and 6.0 W for buildings with three storeys or more. The calculation does not factor in the area of windows and doors nor transmission loss through them.

(9) "Heated floor area" in 7.2-7.4 means the total floor area of the storeys or parts thereof which are heated.
(10) For buildings supplied with district heating, an energy factor of 0.8 for district heating applies to verification of compliance with the energy performance framework.

(11) For buildings supplied with district heating, an energy factor of 0.6 applies to verification that the energy performance framework observes building class 2020. Regardless of supply type, an energy factor for electricity of 1.8 applies to verification that the energy performance framework observes building class 2020.

7.2.2 Energy performance framework for dwellings, student accommodation, hotels, etc.

PROVISION

(1) In the case of dwellings, student accommodation, hotels etc., the total demand of the building for energy supply for heating, ventilation, cooling and domestic hot water per m² of heated floor area must not exceed 30.0 kWh/m² per year plus 1000 kWh per year divided by the heated floor area.

GUIDANCE

(7.2.2(1)) The energy performance framework applies to buildings in which the lighting system is not normally determined at the time of erection. Calculations must take account of solar heat gain, body heat, the heat accumulating properties of the building, etc. This provision also applies to buildings with balanced mechanical ventilation and cooling. For dwellings, student accommodation, hotels, etc., the energy performance framework can be expressed as follows: (30 + 1000/A)kWh/m² per year, where A is the heated floor area.

7.2.3 Energy performance frameworks for offices, schools, institutions, etc. not covered by 7.2.2

PROVISION

(1) For offices, schools, institutions etc., the total demand of the building for energy supply for heating, ventilation, cooling and domestic hot water and lighting per m² of heated floor area must not exceed 41.0 kWh/m² per year plus 1000 kWh per year divided by the heated floor area.

GUIDANCE

(7.2.3(1)) The energy performance framework applies to buildings not covered by 7.2.2. Calculations must take account of solar heat gain, body heat, the heat accumulating properties of the building, etc. This provision also applies to buildings with balanced mechanical ventilation and cooling. For offices, schools, institutions, etc. the energy performance framework can be expressed as follows: (41.0 + 1000/A)kWh/m² per year, where A is the heated floor area.

(2) A building heated to more than 5°C and up to 15°C may not have a demand for energy supplied for heating, ventilation, cooling, domestic hot water and lighting per m² of heated floor area in excess of 41.0 kWh/m² per year plus 1000 kWh per year divided by the heated floor area.

(3) In the case of buildings or building sections whose requirements
include, for example, a high level of lighting, extra ventilation and high consumption of domestic hot water, or which are used for extended periods, or buildings with high ceilings, the energy performance framework must be increased by the resulting calculated energy consumption. Process energy such as ventilation of fume cabinets is not included in the energy performance framework.

7.2.4 Building class 2020

7.2.4.1 Common provisions for buildings covered by building class 2020

PROVISION

(1) Buildings covered by the provisions of 7.2.4.2 or 7.2.4.3 must be built such that the design transmission loss does not exceed 3.7 W per m² of the building envelope in the case of single-storey buildings, 4.7 W for two-storey buildings and 5.7 W for buildings with three storeys or more. The calculation does not factor in the area of windows and doors nor transmission loss through them.

(2) The energy gain through windows and glazed outer walls must not be less than 0 kWh/m² per year during the heating season. The energy gain through rooflights and glazed roofs must not be less than 10 kWh/m² per year. For skylight domes, the U value must not exceed 1.20 W/m²K.

(3) External doors and hatches must not have a U value exceeding 0.80 W/m²K. External doors with glazing must not have a U value exceeding 1.00 W/m²K or an energy gain through the door during the heating season of less than 0 kWh/m² per year. The provisions in 7.6 apply to fire doors.

(4) Gates must have a maximum U value of 1.40 W/m²K.

(5) Volume flow through leaks in the building envelope must not exceed 0.5 l/s per m² of the heated floor area at a pressure differential of 50 Pa.

For buildings with high ceilings, in which the surface area of the building envelope divided by the floor area is greater than 3, the volume flow through leaks may not exceed 0.15 l/s per m² of the building envelope.

(6) Dwellings, student accommodations, hotels, etc. in building class 2020 must have a glazed area of at least 15% of the floor area in habitable rooms and kitchen/family rooms if the light transmittance of the glazing is higher than 0.75. If the light transmittance is lower, the glazed area must be increased correspondingly. Rooflight areas are factored in by a factor of 1.4.

GUIDANCE

(7.2.4.1(1)) This provision ensures that the building envelope as a whole has reasonable insulating properties. The design transmission loss must be determined as specified in DS 418 Calculation of heat loss from buildings. For buildings with high ceilings and which are comparable with two-storey buildings or buildings with three storeys or more, the corresponding transmission loss must be 4.7 and 5.7 W, respectively, per m² of the building envelope. Windows include rooflights, glazed outer walls, glazed roofs and skylight domes. However, insulated sections are included in the design transmission loss.

(7.2.4.1(2)) The energy gain is calculated as specified in Appendix 6 and is based on a weighted average. However, verification of the energy performance framework includes windows with the actual information about solar heat transmittance and U value for each window. Functional glazing may be used; see 7.6(4).

(7.2.4.1(3)) The requirement for external doors apply to a standard size of 1.23 x 2.18 m. External doors with glazing may also include sliding doors. In place of external doors with glazing, a choice may be made between using doors observing the U value requirement or doors observing the energy gain requirement of no less than 0 kWh/m² per year.

(7.2.4.1(5)) The local council makes requirements for how often documentation must be provided of the volume flow through leaks in pressure tests; see 1.4(2)(ii). Pressure testing of the volume flow through leaks in the building envelope must be performed on the basis of DS/EN 13829 Thermal performance of buildings – Determination of air permeability of buildings – Fan pressurisation method. The result of the pressure test must be expressed as the average of measurements using overpressure and underpressure.

(7.2.4.1(6)) Daylight is paramount to health and wellbeing. The size and placing of windows greatly affects the view. Large window areas without effective solar screening may cause overheating and glare problems. A more even distribution of windows and possibly larger north facing windows may reduce the need for electric lighting. When determining the daylight conditions, account should be taken of actual conditions, including the design of the windows, the light transmittance of the pane and the nature of the room and of the surroundings.
In offices, schools and institutions, etc. not covered by 7.2.4.1(6) but established as building class 2020, the glazed area in workrooms, teaching rooms and occupiable rooms must be at least 15% of the floor area if the light transmittance of the glazed area is greater than 0.75. If the light transmittance is lower, the glazed area must be increased correspondingly. Rooflight areas are factored in by a factor of 1.4.

Light transmittance applies to the glazing used. Compensation for glazing with less light transmittance is achieved by increasing the area proportionately. Glazed areas smaller than the building height does not contribute significantly to the daylight level. As an alternative to calculating the glazed areas, daylight levels may be considered satisfactory if the daylight factors for the rooms/spaces are higher than 3% at the workspaces as documented by calculation or if the rooms/spaces have equivalent or better daylight conditions than a comparable rooms/spaces with a proportion of glazing of 15% relative to the floor area.

The daylight provisions may imply that solar control glazing cannot be used in some buildings. When determining the daylight conditions, account should be taken of actual conditions, including the design of the windows, the light transmittance of the pane and the nature of the room and of the surroundings.

Ventilation systems with forced air supply and extraction must incorporate heat recovery with a dry temperature efficiency corresponding to at least step two in EU Regulation 1253/2014/EU. Ventilation systems for one dwelling must incorporate heat recovery with a dry temperature efficiency of no less than 85%.

For ventilation systems with a constant air volume, the specific power consumption for air movement must not exceed 1,500 J/m$^3$ fresh air.

For systems with a variable air volume, the power consumption for air movement must not exceed 1,800 J/m$^3$ at maximum pressure drop.

For ventilation systems for multi-storey buildings, the specific power consumption for air movement must not exceed 1,200 J/m$^3$ fresh air in the background air change.

For systems which supply one dwelling, the specific power consumption for air movement must not exceed 800 J/m$^3$ fresh air.

Electricity consumption for air movement must be calculated as specified in DS 447 Ventilation for buildings – Mechanical, natural and hybrid ventilation systems.

Shared RE units established in connection with new buildings and where the client for the new building contributes financially to the establishment of the RE units may be included in the energy performance framework of the new buildings. The RE unit must be established in the building or in the vicinity.

This provision allows inclusion of shared RE units such as wind turbines, shared solar heating systems, solar photovoltaic arrays or geothermal systems if the RE units are established in connection with the new building. The client for the new building must contribute financially to the establishment of the RE units.

It must be ensured that the CO$_2$ content of the indoor air does not exceed 900 ppm for extended periods of time.

Warm air heating must incorporate individual room regulation.

Warm air heating must incorporate individual room regulation.

7.2.4.2 Energy performance framework for dwellings, student accommodation, hotels etc. in building class 2020.

A building may be classified as building class 2020 when the total

Building class 2020 is expected to become mandatory for
demand for energy supply for heating, ventilation, cooling and domestic hot water per m² of heated floor area does not exceed 20 kWh/m² per year.

7.2.4.3 Energy performance framework for offices, schools, institutions etc. in building class 2020 not covered by 7.2.4.2.

PROVISION

(1) Offices, schools, institutions and other buildings not covered by 7.2.4.2 may be classified as building class 2020 when the total demand for energy supply for heating, ventilation, cooling, domestic hot water and lighting per m² heated floor area does not exceed 25 kWh/m² per year.

(2) For buildings or building sections in building class 2020 whose requirements include, for example, a high level of lighting, extra ventilation and high consumption of domestic hot water, or which are used for extended periods, or buildings with high ceilings, the energy performance framework must be augmented in proportion to the calculated increase in energy consumption. Process energy such as ventilation of fume cabinets is not included in the energy performance framework.

7.3 Change of use and extensions

7.3.1 General

PROVISION

(1) The provisions of 7.3 may be used as an alternative to the provisions of 7.2 for extensions, change of use and conversion associated with a change of use.

(2) In the case of portable cabins for temporary use, the provisions of Appendix 6 apply.

7.3.2 Thermal insulation of building elements

PROVISION

(1) Building elements around rooms/spaces that are normally heated to a minimum of 15°C must have a heat loss of no more than as stated in the column marked temperature T > 15°C; the limit for building elements around rooms/spaces that are normally heated to more than 5°C and up to 15°C is as stated in the relevant column. Windows, doors and rooflights must meet the requirements of 7.6.

<table>
<thead>
<tr>
<th>Building part</th>
<th>U value [W/m² K]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rooms/spaces heated to T &gt; 15°C</td>
<td></td>
</tr>
<tr>
<td>5°C &lt; T &lt; 15°C</td>
<td></td>
</tr>
<tr>
<td>External walls and basement walls in contact with the soil.</td>
<td>0.15 0.25</td>
</tr>
</tbody>
</table>

public new builds by the end of 2018 and for other new builds by the end of 2020.
Partition walls and suspended upper floors adjoining rooms/spaces that are unheated or heated to a temperature which is 5°C or more below the temperature in the room concerned. | 0.40 | 0.40 |
Ground slabs, basement floors in contact with the soil and suspended upper floors above open air or a ventilated crawl space. | 0.10 | 0.15 |
Ceiling and roof structures, including jamb walls, flat roofs and sloping walls directly adjoining the roof. | 0.12 | 0.15 |
Doors/gates. | 1.80 | 1.80 |
Hatches to the outside or to rooms/spaces that are unheated or heated to a temperature which is 5°C or more below the temperature in the room/space concerned (does not apply to ventilation openings below 500 cm²). | 1.40 | 1.50 |
Skylight domes. | 1.40 | 1.80 |

**Building part**

<table>
<thead>
<tr>
<th>Linear loss [W/mK]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations.</td>
</tr>
<tr>
<td>Joint between external wall, windows or external doors and hatches.</td>
</tr>
<tr>
<td>Joint between rooflights and skylight domes.</td>
</tr>
</tbody>
</table>

(2) The use of the U values and linear losses stated for extensions heated to no less than 15°C is subject to the total area of windows and external doors, including rooflights and skylight domes, glazed external walls, glazed roofs and hatches to the outside comprising no more than 22% of heated floor area in the extension. The calculation does not include the floor area and the area of windows and external doors in shops etc. on the ground floor.

(7.3.2(2)) The area of windows and external doors must be calculated as specified in DS 418 Calculation of heat loss from buildings.

(3) In the case of a change of use, constructional factors may prevent full compliance with 7.3.2(1)-(2). The shortfall in efficiency must be compensated for by other energy solutions.

(7.3.2(3)) It may, for example, be difficult to comply with the requirements for linear loss for existing windows and foundations. Alternatively, a corresponding amount of energy can be saved, for example by additional insulation or installation of solar heating, a heat pump or solar cells.

(4) Structural alterations that increase energy consumption may be carried out provided that compensatory energy savings are made. The changes must comply with the associated requirements of 7.3.2(1).

(7.3.2(4)) This provision applies, for example, to a proposal to fit new windows to a facade or roof. The reduced energy performance is compensated for by, for example, extra insulation, solar heating, a heat pump or solar cells.

### 7.3.3 Heat loss framework for extensions

**PROVISION**

(1) U values and linear losses for extensions heated to no less than 15°C can be altered and window areas etc. increased, provided that heat loss from the extension is not greater than if the requirements of 7.3.2 were satisfied. However, insulation of the individual building elements must be at least on a par with the U values and linear losses specified in 7.6.

(7.3.3(1)) The heat loss framework in this context only covers the extension. However, 50% of the previous heat loss through the covered part of the existing building may be allowed for in the heat loss framework. This does not apply to dwellings in roofs. Within the heat loss framework, windows can be included as the actual windows or as windows with a U value of 1.2 W/m²K. Windows, rooflights, glazed external walls and glazed roofs must be calculated as specified in Appendix 6.

### 7.4 Conversion and other alterations to the building and replacement of boilers etc.

#### 7.4.1 General

**PROVISION**

7.4.1(1) For conversions and other alterations to buildings, cost-effective energy savings under 7.4.2(1) and Part 8 must be implemented. The provisions relate to insulation of external walls, floors, roof structures and windows, etc. as well as alterations to installations. The requirement only applies to the building element or installation that is covered by the alteration.

(7.4.1(1)) Article 7 of Directive 2010/31 of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast) is observed by the provisions of Part 7. Painting, rendering of facades, patching of holes in roof cladding and cavity wall insulation are alterations that do not result in a requirement for cost-effective energy savings.

Reference is made the Danish Transport and Construction
(2) For replacement of building elements or services, the provisions of 7.4.2(1) and (3) and Part 8 must be observed regardless of their cost-effectiveness.

(3) Churches, listed buildings and buildings which form part of a scheduled ancient monument are excluded from the provisions of 7.4.2. Buildings worthy of preservation and covered by a protective town planning by-law, a local preservation plan or a registered preservation order, buildings designated in the local plan as worthy of preservation and buildings which the Danish Minister for Cultural Affairs has decided to designate as worthy of preservation under section 19(1) of the Building Protection Act are likewise excluded from the provisions of 7.4.2 if compliance with these requirements would contravene the plan or designation concerned.

(4) In special cases of complex building structures, the measures described in the guidelines on cost-effective structures issued by the Danish Energy Agency cannot be carried out cost-effectively. In such cases the financial unviability must be verifiable.

(5) Depending on the structural form and the extent of insulation of the building, there may be solutions which cannot not be carried out without detriment to moisture-proofing. Such works are not to be carried out.

(6) Structural alterations that increase energy consumption may be carried out provided that compensatory energy savings are made.

(7) Conversion work which is necessitated by significant change of use is covered by 7.3 and must satisfy these requirements even if the alterations may not be cost-effective.

(7.4.1(2)) "Replacement" means for example a brand new facade, a new roof structure, including roofing, rafters, insulation and attic, and the replacement of a window, circulation pump or boiler. The requirement has been established taking into account that it usually will be cost-effective to comply with the requirements set out in 7.4.2(1) and (3)-(6) and Part 8. Under certain circumstances, it may not be possible to make the replacement without excessive additional costs. In such cases, full insulation is not required, but if a lower level of insulation can be achieved this must be carried out.

(7.4.1(3)) The Planning Act only allows for planning to preserve the external appearance of a building. The exclusion for buildings worthy of preservation applies to building works that will have a visual impact on the external elements of a building covered by the protective plan or designation. Energy-saving measures should be made without impairing the value of the preservation-worthy building concerned. It appears from 7.4.2(2) that constructional factors may render it impossible to achieve energy savings in a cost-effective or moisture-proof manner. If energy-saving improvements can be achieved only through internal post- or retro-insulation, but where such insulation cannot be performed in a technically proper manner or where such insulation will result in an indoor climate that does not live up to the rules and regulations in force, energy-saving improvements will not be required in the specific situation.

Section 22 of the Danish Building Act provides that exemption from the provisions of 7.4.2 may be granted if deemed compatible with the intentions of the provisions. Exemption may for example be granted if compensatory energy savings can be achieved by other means. Energy Guide for Listed Buildings and Buildings Worthy of Preservation, Bygningskultur Danmark 2010, provides examples of energy-saving solutions which do not compromise on the historical and cultural qualities of the house.

(7.4.1(4)) Structural measures may be deemed to be cost-effective if the annual saving multiplied by the lifetime divided by the investment is greater than 1.33. This corresponds to the measure concerned paying for itself within 75% of its expected lifetime. For example, if work performed has a lifetime of 40 years, the investment must be recouped in 30 years. The design lifetimes are given in Appendix 6.

(7.4.1(5)) In terms of moisture-proof insulation works, see SBI Guidelines 224 Fugt i bygninger [Moisture in buildings], SBI Guidelines 239 Efterisolering af småhuse - energibesparelser og plantægning [Retro-fitted insulation of small houses - energy savings and planning], SBI Guideelines 240 Efterisolering af småhuse - byggetekniske løsninger [Retro-fitted insulation of small houses - constructional solutions] and various construction experience of different solutions from BYGERFA [Construction Experience Sharing].

(7.4.1(6)) This provision applies, for example, to a proposal to fit new windows to a facade or roof. The reduced energy performance is compensated for by, for example, extra insulation, solar heating, a heat pump or solar cells.
7.4.2 Requirements for conversions and other alterations to the building

**PROVISION**

(1) Conversions and other alterations to the building must comply with the following requirements for U values and linear losses:

<table>
<thead>
<tr>
<th>Building element</th>
<th>U value [W/m²K]</th>
</tr>
</thead>
<tbody>
<tr>
<td>External walls and basement walls in contact with the soil.</td>
<td>0.18</td>
</tr>
<tr>
<td>Partition walls and suspended upper floors adjoining rooms/spaces that are unheated or heated to a temperature which is 5°C higher or lower than the temperature in the room concerned.</td>
<td>0.40</td>
</tr>
<tr>
<td>Ground slabs, basement floors in contact with the soil and suspended upper floors above open air or a ventilated crawl space.</td>
<td>0.10</td>
</tr>
<tr>
<td>Ceiling and roof structures, including jamb walls, flat roofs and sloping walls directly adjoining the roof.</td>
<td>0.12</td>
</tr>
<tr>
<td>Doors/gates.</td>
<td>1.80</td>
</tr>
<tr>
<td>Hatches, new secondary windows and skylight domes.</td>
<td>1.40</td>
</tr>
<tr>
<td>Renovated secondary windows.</td>
<td>1.65</td>
</tr>
</tbody>
</table>

**GUIDANCE**

(7.4.2(1))

Cost-effective thermal insulation must be fitted in connection with conversion and alterations to building elements. Examples of works where cost-effective insulation can be installed are:
- Laying of new roof felt in the form of new roofing membrane or top felt on an existing roof.
- A new tiled roof or similar.
- A new steel sheet roof on an old felted roof or a roof of fibre cement sheets.

The requirements of 7.4.2(1) apply to the actual sizes of hatches, secondary windows and skylight domes.

New secondary windows (1+2) cover the total solution for new windows combined with a new additional, self-contained frame/sill. Renovated secondary windows are windows which are dismantled, renovated and reinstalled in another building. In this context, the removal of windows for work which is comparable to regular maintenance, for example painting, putting and repair is not a renovated window if the windows are reinstalled in the same building.

No requirements are specified for the energy performance of secondary window frames which are fitted on existing, permanent windows.

Linear losses are significant factors in relation to energy-efficiency and minimisation of indoor climate nuisances. The provisions relating to linear losses on replacement of windows, improvement of external walls or floor constructions currently only apply if improvements are made at the same time to the elements that are causing the linear losses.

Constructional factors may prevent compliance with the requirements of 7.4.2(1), see therefore 7.4.2(2).

If it is decided to replace floor structures, external walls, doors, windows or the roof structure, 7.4.2(1) and 7.4.2(3)-(6) apply regardless of cost-effectiveness; but see 7.4.1(2).

<table>
<thead>
<tr>
<th>Building element</th>
<th>Linear loss [W/mK]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations.</td>
<td>0.12</td>
</tr>
<tr>
<td>Joint between external wall, windows or external doors and hatches.</td>
<td>0.03</td>
</tr>
<tr>
<td>Joint between roof structure and rooflights or skylight domes.</td>
<td>0.10</td>
</tr>
</tbody>
</table>

(2)

Constitutional factors may render cost-effective compliance with the provisions of 7.4.2(1) impossible without detriment to moisture resistance.

There may, however, be less extensive work whereby energy demand can be reduced. If so, it is this work which is to be carried out.

(3)

The replacement of external doors, windows and rooflights must comply with the requirements of 7.6.

3.4.3 Energy performance frameworks for existing buildings

**GENERAL**

(1)

As an alternative to the requirement in 7.4.1(1), the requirements for conversion may be met through compliance with the energy performance frameworks for existing buildings.

Verification must be on the basis of SBI Guidelines 213 Bygningsenergibehov [Energy demands of buildings].

(7.4.3.1(1))


The requirements for replacement of building parts or services in 7.4.1(2) must still be observed.

(2)

To observe the renovation classes, the requirement for supplied energy must be improved by at least 30 kWh/m² as at year.
Part of the total energy supply to buildings must be renewable energy.

If renovation class 1 is used, the requirements for indoor climate in Part 6 must be observed.

### 7.4.3.2 Energy performance framework for dwellings, student accommodation, hotels, etc.

1. A building may be classified as renovation class 2 when the total demand for energy supply for heating, ventilation, cooling and domestic hot water per m² of heated floor area does not exceed 110 kWh/m² per year plus 3200 kWh per year divided by the heated floor area. (7.4.3.2(1))

2. A building may be classified as renovation class 1 when the total demand for energy supply for heating, ventilation, cooling and domestic hot water per m² of heated floor area does not exceed 52.5 kWh/m² per year plus 1650 kWh per year divided by the heated floor area. (7.4.3.2(2))

### 7.4.3.3 Energy performance frameworks for offices, schools, institutions, etc.

1. A building may be classified as renovation class 2 when the total demand for energy supply for heating, ventilation, cooling, domestic hot water and lighting per m² of heated floor area does not exceed 135 kWh/m² per year plus 3200 kWh per year divided by the heated floor area. (7.4.3.3(1))

2. A building may be classified as renovation class 1 when the total demand for energy supply for heating, ventilation, cooling, domestic hot water and lighting per m² of heated floor area does not exceed 71.3 kWh/m² per year plus 1650 kWh per year divided by the heated floor area. (7.4.3.3(2))

3. In the case of buildings or building sections whose requirements include, for example, a high level of lighting, extra ventilation and high consumption of domestic hot water, or which are used for extended periods, or buildings with high ceilings, the energy performance framework must be increased by the resulting calculated energy consumption. Process energy such as ventilation of fume cabinets is not included in the energy performance framework. (7.4.3.3(3))

### 7.5 Holiday homes

PROVISION

U values for windows, external doors, rooflights, glazed external walls, glazed roofs and skylight domes apply to the actual size. (7.5(1))

<table>
<thead>
<tr>
<th>Building element</th>
<th>U value [W/m² K]</th>
</tr>
</thead>
<tbody>
<tr>
<td>External walls and basement walls in contact with the soil.</td>
<td>0.25</td>
</tr>
<tr>
<td>Partition walls and suspended upper floors adjoining unheated rooms/spaces.</td>
<td>0.40</td>
</tr>
<tr>
<td>Ground slabs, basement floors in contact with the soil and suspended upper floors above open air or a ventilated crawl space.</td>
<td>0.15</td>
</tr>
<tr>
<td>Ceiling and roof structures, including jamb walls and flat roofs.</td>
<td>0.15</td>
</tr>
<tr>
<td>Windows, external doors, rooflights, glazed external walls, glazed roofs and skylight domes facing the outside or facing unheated rooms/spaces.</td>
<td>1.80</td>
</tr>
</tbody>
</table>
(2) U values and linear losses in 7.5(1) apply subject to the total area of windows and external doors, including rooflights and skylight domes, glazed external walls, glazed roofs and hatches facing the outside does not comprise more than 30% of the heated floor area.

(3) Derogation from these values may be possible provided that the design heat loss by transmission does not thereby become greater than if the requirements of 7.5(1)-(2) were satisfied.

(4) For conversions, other alterations and replacement, the requirements of 7.5(1) apply subject to the necessary cost-effectiveness. Cost-effectiveness is assessed as in 7.4.1(1).

(7.5(4)) The assessment of cost-effectiveness must regard the holiday home as also being used as a dwelling during the winter half of the year.

(5) In holiday homes, solid external walls of e.g. timber, lightweight concrete or clay blocks with a U value of more than 0.50 W/m²K may, however, be used provided the maximum permissible heat loss in 7.5(3) is observed.

(7.5(5)) This provision allows the use of solid timber external walls for uninsulated holiday homes, as may lightweight concrete or solid block walling.

### 7.6 Minimum thermal insulation

#### PROVISION

(1) If the energy performance framework set out in 7.2, the maximum permissible heat loss in 7.3.3 or the holiday home provisions in 7.5(3) is used, the individual building elements must be insulated such that the heat losses through them do not exceed the values in the following table.

#### GUIDANCE

(7.6(1)) The minimum insulation requirement is not only a response to the requirement for energy savings but also a means of providing comfort and avoiding the risk of condensation. The cited maximum heat loss applies to the entire building part. Any cold bridges in the building part must therefore be included. DS 418 Calculation of heat loss from buildings details typical cold bridges and their contribution to heat loss. The requirement for external doors apply to a standard size of 1.23 x 2.18 m. External doors with glazing may also include sliding doors. Insulated sections in glazed external walls and windows must be included in the design transmission loss. The requirement is for the centre U value. In certain cases, for example high buildings or difficult soil conditions, it may be difficult to fully comply with the requirements for linear loss at foundations. In these cases, a correspondingly higher linear loss coefficient is acceptable. The additional heat loss must be included in the energy performance framework.

<table>
<thead>
<tr>
<th>Building element</th>
<th>U value [W/m² K]</th>
</tr>
</thead>
<tbody>
<tr>
<td>External walls and basement walls in contact with the soil.</td>
<td>0.30</td>
</tr>
<tr>
<td>Suspended upper floors and partition walls adjoining rooms/spaces that are unheated or heated to a temperature which is 5°C or more below the temperature in the room concerned.</td>
<td>0.40</td>
</tr>
<tr>
<td>Ground slabs, basement floors in contact with the soil and suspended upper floors above open air or a ventilated crawl space.</td>
<td>0.20</td>
</tr>
<tr>
<td>Suspended floors below floors with underfloor heating adjoining heated rooms/spaces.</td>
<td>0.50</td>
</tr>
<tr>
<td>Ceiling and roof structures, including jamb walls, flat roofs and sloping walls directly adjoining the roof.</td>
<td>0.20</td>
</tr>
<tr>
<td>External doors without glazing.</td>
<td>1.40</td>
</tr>
<tr>
<td>External doors with glazing.</td>
<td>1.50</td>
</tr>
<tr>
<td>Doors and hatches to the outside or to rooms/spaces that are unheated and these as well as glass walls and windows to rooms that are heated to a temperature which is 5°C or more below the temperature in the room concerned.</td>
<td>1.80</td>
</tr>
</tbody>
</table>
(2) The energy gain through windows and glazed outer walls must not be less than -17 kWh/m²/year.

(3) The energy gain through rooflights and glazed roofs must not be less than 0 kWh/m² per year.

(4) Noise-reducing and other functional glazing may be used provided the reference window using the manufacturer's standard pane complies with the requirement of energy gain. Other alternatives such as movable external solar screening should be considered before opting for solar control glass.

8. Services

8.1 General

PROVISION

(1) Services must be installed so as not to constitute any danger to persons nor cause damage to the building. Vibration nuisance must not be transmitted to the building.

GUIDANCE

(8.1(1)) Part 8 applies to services in a building or outside on the plot. The part covers services for electricity, gas, water, heating, cooling, drainage and ventilation. Services for waste disposal facilities, personal transport and transport and equipment with the aim of making the buildings accessible are also covered by Part 8.

In Part 8, "exhaust systems" means chimneys and flues with associated joints and any type of systems that receive combustion products from one or more combustion plants. See also the Executive Order on the Use of Pressure Equipment and the Executive Order on the Design of Pressure Equipment. These executive orders apply to pipe systems, tanks, solar collectors, heat pumps, cooling systems, boilers, etc. in which gases or vapours can occur at a pressure of more than 0.5 bar. For information on excavations for services; see the Danish Register of Underground Cable Owners (LER), and DS/EN 1997-1 Geotechnical design.

EU regulations have been prepared for a number of components in Part 8, and they have replaced the Danish Building Regulations. The EU regulations include requirements for ventilation units, CHP appliances, oil/gas boilers, heat pumps and circulation pumps. Where requirements were

### Table: Linear Loss [W/mK]

<table>
<thead>
<tr>
<th>Building element</th>
<th>Linear loss [W/mK]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skylight domes.</td>
<td>1.40</td>
</tr>
<tr>
<td>Insulated sections in glazed external walls and windows.</td>
<td>0.60</td>
</tr>
<tr>
<td>Suspended upper floors and walls against freezer rooms.</td>
<td>0.15</td>
</tr>
<tr>
<td>Suspended upper floors and walls against cold stores.</td>
<td>0.25</td>
</tr>
<tr>
<td>Foundations around spaces that are heated to a minimum of 5°C.</td>
<td>0.40</td>
</tr>
<tr>
<td>Foundations around floors with underfloor heating.</td>
<td>0.20</td>
</tr>
<tr>
<td>Joint between external wall and windows or external doors and hatches.</td>
<td>0.06</td>
</tr>
<tr>
<td>Joint between roof structure and rooflights or skylight domes.</td>
<td>0.20</td>
</tr>
</tbody>
</table>

(7.6(2)-(3)) The calculation of energy gain through windows and rooflights must be in accordance with Appendix 6. The requirement applies to a reference window 1.23 m x 1.48 m fitted with the manufacturer's standard pane. For example, if a window is in the form of a "Dannebrog" type window or one fitted with a fresh air vent, the requirement for the reference window is still used, provided the window is fitted with the manufacturer's standard pane.

(7.6(4)) In certain circumstances, special types of glazing are called for and may mean that the window considered does not comply with the requirements for replacement in 7.6(2)-(3); but provided the window with the manufacturer's standard pane complies with the relevant provisions, the window may still be used. Differences in values for energy performance for the window must be attributable to the necessary function of the glass. For example, laminated glass may be used if this is necessary for safety reasons. However, the gas type or energy coating may not be changed. Solar control glass may be an effective way of excluding solar heat gain. Unfortunately, solar control glass also means that solar heat gain is reduced at times of the year when it could be useful. Therefore, alternatives such as external solar screening should be considered. However, glass with a lower heat transmittance (g value) may be used if an energy gain can be demonstrated.
(2) Services must be installed such that they do not constitute a fire hazard or explosion hazard. Pipe penetrations, ducts etc. must incorporate measures to prevent the passage of noise, moisture, fire, gas, smoke and odours.

(3) The surface temperature of combustible materials must be kept low enough to prevent the risk of ignition.

(4) Combustible materials must be kept at no less than the following separation distances from brick chimneys and exhaust systems and accessory parts not covered by the CE marking:
1) Chimneys: 100 mm.
2) Horizontal flues: 300 mm and vertical flues: 225 mm.
3) Pellet burner flues 80 -100 mm diameter: 225 mm.
4) Cleaning hatches in chimneys: 200 mm.

(5) In the case of a 80-100 mm diameter flue pipe from a pellet burner the distance from the floor may be reduced to 150 mm if the floor is covered with a non-combustible plate.

(6) Services must be installed so as to ensure satisfactory health conditions. The intention of this provision is to prevent the penetration of smoke from combustion plants into the building. This provision also covers measures against rats and other pests. See also Part 6 concerning radon and other pollution from the subsoil. See also Part 6 concerning noise from energy-producing systems.

(7) Services which are at risk of exposure to frost must be frost-proofed.

(8) Services must be installed so as to avoid any unnecessary risk of corrosion.

(9) Services must be built so as to prevent unnecessary energy consumption. They must be insulated against heat loss and condensation in accordance with DS 452 Code of practice previously made for the individual components of Danish Building Regulations, the requirement has been replaced by a reference to the relevant EU Regulation. In the long term, this will be phased out of the Danish Building Regulations. It is the duty of the owner to stay up-to-date on existing new requirements in EU regulations.

(8.1(3)) This requirement for combustible materials is normally satisfied if the surface temperature does not exceed 85°C. When this is not achieved, services of a temperature of between 85°C and 100°C should be kept at least 30 mm from woodwork or other combustible materials. At a temperature of between 100°C and 150°C, the separation distance should be no less than 50 mm. For heat producing appliances and exhaust systems, the separation distance for combustible materials can be determined by the CE marking. If so, the specified separation distance from combustible materials must be observed.

If the separation distance from combustible materials is not specified, this requirement may be deemed to be satisfied if the distance from the outside of a heat-producing appliance to combustible materials in walls and ceilings is no less than 500 mm. For brick fireplaces and massive stoves, the distance must be measured from the inside of the fireplace. Note that built-in light fittings can lead to discolouration of e.g. ceilings at temperatures as low as 60°C.

(8.1(4)) The distances must be measured from the outside. Accessory parts are draught stabilisers, cleaning hatches, dampers, etc. For roofing with insufficient fire resistance, see 8.5.3.5(1).

(8.1(5)) Due to thermal radiation from the flue, a sheet of glass is not suited as a cladding sheet.

(8.1(6)) The intention of this provision is to prevent the penetration of smoke from combustion plants into the building. This provision also covers measures against rats and other pests. See also Part 6 concerning radon and other pollution from the subsoil. See also Part 6 concerning noise from energy-producing systems.

(8.1(8)) For information on corrosion protection; see SBI Guidelines 227 Korrosion i vvs-installationer [Corrosion in plumbing systems].

(8.1(9)) Wherever possible, pipes and tanks should be fitted so that heat emitted from them benefits the building.
for thermal insulation and technical service and supply systems in buildings.

(10) Building services and equipment etc. that require servicing, frequent adjustments, inspections or maintenance, must be installed so as to allow such interventions to proceed in a suitable and appropriate manner.

(11) With the aim of making buildings accessible for persons with impaired mobility, installations and services in buildings which house places of public assembly must be designed and improved, taking account of what is technically feasible, to allow the installation and use of technical aids for the disabled.

(12) Places of public assembly, including facilities designed for shared activities such as concerts, lectures and other entertainment, must have fixed induction loop systems or similar equipment for the hearing impaired which is at least as effective as an induction loop system.

(13) If a server room is established in a building, the power consumption of servers must be measured. Similarly, power consumption or cooling output for cooling the server room must be measured.

(14) Meters used to measure power consumption or cooling, see se 8.1(13) must have a satisfactory accuracy.

8.2 Distribution systems for heating, cooling and domestic hot water

PROVISION

(1) Heating and cooling systems must be appropriately designed and installed in terms of safety, energy and indoor climate considerations.

(2) Heating and cooling systems must be sized, designed, controlled and operated as specified in DS 469 Heating and cooling systems in buildings.

GUIDANCE

(8.2(2)) DS 469 comprises all types of heating and cooling systems, the purpose of which is to supply heat or cooling to rooms/spaces and buildings and related systems. The heating medium and the cooling medium in the system may be water, air or
Domestic water systems must be installed so as to minimise the risk of growth of legionella bacteria in the hot water.

In order to minimise the risk of growth of legionella in the hot water, measures should be taken to prevent this. One possible measure could be to ensure that the domestic hot water temperature can be increased sufficiently, see DS 439 Code of Practice for domestic water supply installations. It should be taken into account that the use of natural rubber and certain types of synthetic rubber may increase the risk of legionella growth.

Circulation pumps in heating systems, hot water supply, geothermal heating and cooling systems must comply with the requirements set out in EU Regulation No 641/2009/EC.

8.3 Ventilation systems

PROVISION

(1) Ventilation systems must be appropriately designed and installed in terms of safety, energy and indoor climate considerations.

(2) Ventilation systems must function without consuming unnecessary levels of energy and without detrimental interference by other air consuming appliances. Provision must be made for restricting the supply of fresh air during periods when the need for ventilation of the building is reduced. Provision must be made for adjusting the supply of fresh air to suit the loads in rooms/spaces with highly variable ventilation needs.

(3) Ventilation systems must be designed, installed, fully commissioned and handed over as stated in DS 447 Ventilation for buildings – Mechanical, natural and hybrid ventilation systems.

(4) Ventilation systems must comply with DS 428 Code of practice for technical measures for fire protection in ventilation systems.

(5) Ventilation systems must be cleaned, operated and maintained so as to keep them in good technical and hygienic condition and as specified in DS 447 Ventilation for buildings – Mechanical, natural and hybrid ventilation systems.

(6) Ventilation systems with forced air supply and extraction must comply with the requirements for heat recovery set out in EU Regulation No 1253/2014. Liquid-coupled batteries may only be used, if separation of the air flows is essential for maintaining the function of the rooms. The requirement for heat recovery may, however, be waived when the surplus heat from the exhaust air cannot reasonably be used. The heat recovery unit can be combined with a heat pump for heat recovery. A heat pump may also be used in connection with extraction systems. Heat pumps must have a minimum COP (coefficient of performance) of 3.6.

GUIDANCE

(8.3(1)) Indoor climate-related ventilation provisions are stated in Part 6.

(8.3(2)) Air consuming appliances include gas and oil-fired appliances, fireplaces, wood-burning stoves, biofuel boilers, pellet stoves, tumble driers, airing cupboards, fume cabinets, etc.

(8.3(6)-(10)) More stringent requirements apply in respect of ventilation systems related to building class 2020; see 7.2.4.1(8)-(9).

Recirculation is not considered to be an alternative to a heat recovery system. Enhanced requirements apply to ventilation systems that only supply one dwelling; see 8.3(7). The requirement for heat recovery may for example be waived in rooms which only have a cooling demand. The requirement in the EU Regulation corresponds to a temperature efficiency of 67%.
heating mode.
COP in heating mode must be documented in accordance with DS/EN 14511 Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling – Parts 1-3.

(7) Ventilation systems with forced air supply and extraction that supply one dwelling must incorporate heat recovery with a dry temperature efficiency of no less than 80%.

(8) For ventilation systems that serve several dwellings or business units, and in which vapours or particles can arise, solutions must be selected that ensure good air quality.

(9) For ventilation systems with a constant air volume, the specific power consumption for air movement must not exceed 1,800 J/m³ fresh air.
For systems with a variable air volume, the power consumption for air movement must not exceed 2,100 J/m³ at maximum pressure drop.
For ventilations systems for multi-storey buildings, the specific power consumption for air movement must not exceed 1,500 J/m³ fresh air in the background air change.
For extraction systems without mechanical fresh air supply, the specific power consumption for air movement must not exceed 800 J/m³ at maximum pressure drops.
This provision does not apply to systems associated with industrial processes or systems whose annual power consumption for air movement is less than 400 kWh.

(10) For ventilation systems with a constant or variable air volume and heat recovery supplying one dwelling, the specific power consumption for air movement may not exceed 1,000 J/m³ at the maximum pressure drop. The installation must be provided with power via a connection that allows power consumption to be measured.

(11) Equipment for humidifying intake air may only be installed if this is warranted by reasons of safety, production, preservation or health.

(12) Exhaust ducts from natural ventilation must be taken above roof level, to a height and with a design that achieves satisfactory performance without causing nuisance to the surroundings.

(13) Ventilation ducts for natural ventilation must be sufficiently airtight.

(14) Ventilation systems where the power consumption of fans exceeds 3,000 kWh/year must be fitted with electricity meters for measuring power consumption. The provision applies to new buildings and to new installations in existing buildings.

(15) In ventilation systems where heat consumption for heated surfaces exceeds 10,000 kWh/year, heat consumption...
must be measured. The power consumption of electricity-heated surfaces where total consumption exceeds 3,000 kWh/year must be measured. The provisions apply to new buildings and to new installations in existing buildings.

8.3(16)
Meters used to measure power consumption or heating, see 8.3(14)-(15) must have a satisfactory accuracy.

(8.3(16))
The requirement is deemed to be met if type-approved meters or meters with an equivalent accuracy are used.

8.4 Water and drainage systems

8.4.1 General

PROVISION

(1) Water and drainage systems must be designed so as to provide satisfactory performance in terms of fire, safety, functional and health considerations.

(8.4.1(1))

(2) Water and drainage systems must be made of materials and components that are sufficiently durable for the stresses to which they are subjected.

(8.4.1(2))
These stresses may be thermal or mechanical loads, corrosion, etc. and may be both internal and external.

(3) Water and drainage systems must be sufficiently watertight to prevent accidental infiltration or exfiltration.

(4) The siting of water and drainage systems relative to building elements such as foundations or fixings to building elements, must be such that damage cannot be caused to the services or building elements.

(5) Factory-made products used in or connected to plumbing or drainage systems must, in terms of mechanical/physical characteristics, either:

(i) be CE marked to show that the products conform to a harmonised standard or are covered by a European Technical Approval (ETA) with the declared properties which are relevant for Denmark; or

(ii) have undergone tests for the properties which are relevant for Denmark and be subject to production control performed by the manufacturer to ensure that the declared performance is maintained.

(8.4.1(5))
See Appendix 7 and 8.4.2.4(2).

(6) Rainwater systems in which rainwater from roofs is used for WCs and washing machines must be designed in accordance with the Executive Order on Water Quality and Inspection of Water Supply Systems.

(8.4.1(6))
See guidance note: Rørcenter-anvisning 003 Brug af regnvand og wc-skyl og vaskemaskiner i boliger [Pipe Centre guidance 003 Use of rainwater for WC flushing and washing machines in dwellings].

(7) Water and drainage systems must be designed so as to eliminate the risk of bursting or harmful pressures and water hammer.

(8.4.1(9))

(9)
Water and drainage systems must be maintained so as to be kept in good technical and hygienic condition.

In respect of growth of bacteria in hot water installations, see 8.4.2.2.

(10) Operating and maintenance instructions must be prepared and must be available when the systems are commissioned. The instructions must contain a set of layout drawings with information on the location of all components that require maintenance and inspection. Maintenance and inspections must be described.

8.4.2 Plumbing systems

8.4.2.1 General

PROVISION

(1) Plumbing systems must be designed and installed so as to achieve satisfactory water supply at each individual draw-off point, taking account of the supply conditions and the use of the building and the system.

(2) At all draw-off points, cold water must comply physically, chemically and bacteriologically with the Executive Order on Water Quality and the Inspection of Water Supply Systems. Cold water must be provided at a sufficiently low temperature without undue waiting time. This provision does not apply to installations covered by 8.4.1(8), nor to special systems for water for technical purposes.

(3) To protect the water supply system from impurities being drawn back into the drinking water system, a non-return valve must be fitted to the distribution pipe after the buried pipe enters the property and before any branch to another pipe.

(4) Plumbing systems must be designed so that treated water and water drawn off at a draw-off point cannot be drawn back into the drinking water system.

(5) If drinking water systems can come into contact with substances which are hazardous to health, the systems must be designed to prevent ingress of such substances into the drinking water system by corrosion or diffusion, so that health hazards cannot arise.

(6) Plumbing systems must be designed so as to avoid unnecessary water consumption, including waste of water.

(7) Plumbing systems must be designed so as to avoid overflow nuisance from the hot to the cold water system.

(8) Plumbing systems must be designed so that the...

In respect of growth of bacteria in hot water installations, see 8.4.2.2.

GUIDANCE

(8.4.2.1(2)) The requirement may be met in part by ensuring that there are no dead ends the system.

(8.4.2.1(3) and 4)) In drinking water systems, measures to guard against backflow of treated water must be commensurate with any health risk posed by the treated water and for the type and use of the systems. See DS/EN 1717 Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow and the guidance note: Rørcenter-anvisning 015 Tilbagestrømningssikring af vandforsyningssystemer [Pipe Centre guidance 015 Preventing backflow in water supply system].

(8.4.2.1(6)) See guidance note: Rørcenter-anvisning 002 Ressourcebesparende vandinstallationer i boliger [Pipe Centre guidance 002 Resource-saving plumbing systems in dwellings].

(8.4.2.1(8)) See the Executive Order on Individual Metering of Electricity,
consumption of hot and cold water can be metered.


(9) Services for water for technical use and systems which for other reasons are not compliant with the standards for drinking water quality must be marked in such a way that incorrect use can be avoided.

8.4.2.2 Hot water

PROVISION

(1) Plumbing systems must be designed so as to function with the least possible risk of growth of bacteria.

See guidance note: Rørcenter-anvisning 017 Legionella – Installation principles and control methods. Attention is also drawn to the fact that the use of some materials such as natural rubber and certain types of synthetic rubber may increase the risk of legionella growth. In the installation, it should therefore be taken into account if such materials are used.

(2) Appliances for the production of domestic hot water must, taking account of the number and uses of the hot water draw-off points, be able to provide a sufficient volume and flow of water at an appropriate temperature for the purpose. The hot water must be provided at an appropriate temperature without undue waiting time.

The need for hot water at all draw-off points should be considered. In the case of draw-off points with low water consumption and long supply runs, local heating should be considered.

(3) Plumbing systems must be designed such that drawing off hot water does not involve a risk of scalding, and such that surface temperatures that could cause personal injury do not arise.

(4) The facility must be provided for tracing liquids other than water which are used in heat exchangers for domestic water and for detecting them in the domestic hot water supply.

The provision does not apply if an extension or altered premises are supplied from an existing system.

(5) The total heat consumption for hot water heating and circulation must be measured if such heat consumption exceeds 10,000 kWh per year. The provision applies to new buildings and to new systems in existing buildings.

The requirement is deemed to be met if type-approved meters or meters with an equivalent accuracy are used.

(6) Meters used to measure heating, see se 8.4.2.2(5) must have a satisfactory accuracy. If the measurement of heat for heating and circulation of hot water forms the basis of the distribution of expenses, the heat energy meter must be in accordance with the Executive Order on Metering Technology Control of Meters Used for Measuring Heat Consumption in District Heating Systems.

8.4.2.3 Flooding

PROVISION

(1) Plumbing systems must be designed so as to provide adequate protection against water overflow or leakage of water which could damage the building. The design must

This provision means that, for example, a shower unit designed to be built in, may be built into a concrete wall, provided that a duct is also built in to ensure that water from a leak can be run
facilitate prompt detection of leaks.

off without damaging the building and so that the leak can be detected before it damages the building.

(2) Draw-off points may only be provided where there is a drainage system with sufficient capacity, or where the water can be either discharged by another means or collected in a suitable manner.

(3) Appliances with automatic water filling in rooms without a floor gully must have protection, either retro-fitted or built-in, against accidental discharge of water and must be located such that leakage of water can be detected.

8.4.2.4 Materials, products and workmanship

(1) Plumbing systems must be made of materials that do not leach health-hazardous substances into the water or give rise to odour, taste or discoloration nuisances or inappropriate growth of micro-organisms.

(2) Factory-made products used in or connected to permanent drinking water or drainage systems up to and including the draw-off point – in terms of properties affecting the quality of drinking water, see the Executive Order on Water Quality and Supervision of Water Supply Systems – are subject to approval by the Danish Transport and Construction Agency unless the product concerned is excluded in accordance with the Executive Order on the Issuance of Certifications for Building Materials in Contact with Drinking Water.

(8.4.2.4(1)) This requirement applies to all materials used in the installation, such as pipes, fittings and gaskets.

(8.4.2.4(2)) The administration of the certification scheme for building materials in contact with drinking water has, in compliance with section 28(2) of the Danish Building Act, been delegated to a private business enterprise and is regulated by the Executive Order on the Issuance of Certifications for Building Materials in Contact with Drinking Water.

(3) System parts fitted such that they cannot be replaced must be of such a quality that they can last as long as the building element in which they are fitted.

8.4.3 Drainage systems

8.4.3.1 General

PROVISION

(1) Each location and component on a plumbing system with a draw-off point must be provided with appropriate drainage.

(8.4.3.1(1)) Floor gullies are not required in rooms in which all components of services are fitted with overflows; but see 4.5(5). See guidance note: *Racrer-center-anvisning 001 Ressourcebesparende afløbsinstallationer i boliger* [Pipe Centre guidance 001 Resource-saving drainage systems in dwellings].

(2) Rainwater drainage must be provided such that seepage or rainwater harvesting does not constitute a risk to buildings or building elements, or other disadvantages such as disruption of traffic.

(8.4.3.1(2)) In accordance with the environmental legislation the local council/utility company may require that rainwater is not discharged to main sewers or that it must be dealt with on site by, for example, green roofs, ponds, ditches, rainwater beds, infiltration in green areas or soakaways (known as SUDS systems – sustainable urban drainage systems). When rainwater is dealt with on site, a permit is required in accordance with environmental legislation. See guidance note: *Racrer-center-anvisning 016 - Anvisning for håndtering af regnvand på egen grund* [Pipe Centre guidance 016 - Guidance for dealing with rainwater on site], and guidance note: *Racrer-center-anvisning 009 - Nedsivning af regnvand i faskiner* [Pipe Centre guidance 009 - Seepage of rainwater into soakaways]. Regulations on the discharge of rainwater may be imposed by the local plan.
Drainage systems must be designed and built so as to achieve satisfactory disposal of the discharged sewage and runoff, taking account of the connections and the surroundings and of the intended use of the system, the plot and the building.

Sewage must be discharged in proportion to the inflow so that flooding does not occur as a result of normal use of the systems. Rainwater must be drained without causing flooding at the design rainfall intensity set by the local council.

Drains should be provided from chimneys and flues from condensing boilers, small-scale CHP plants (combined heat and power) and from heat exchangers in heat pumps and cooling systems.

See guidance note: Rørcenter-anvisning 011 Vacuumsystemer i bygninger. Vejledning i projektering, udførelse og drift [Pipe Centre guidance 011 Vacuum systems in buildings. Guidance on the design, installation and operation].

If an anti-flood valve is installed to protect against flooding, the anti-flood valve must be constructed in accordance with DS 432 Code of practice for sanitary drainage, table 4.6.1. The provision applies regardless of whether the anti-flood valve is installed inside the building or in a well on the owner’s plot outside the building.

See guidance note: Rørcenter-anvisning 021 Kælderoversvømmelser – Sikring mod opstigende kloakvand [Pipe Centre guidance 021 Basement flooding – Protection against rising sewer water].

Drainage systems must be contained within the site.

8.4.3.2 Materials, products and workmanship

PROVISION

(1) Substances with the potential to damage or impair the functioning of the main drainage system, wastewater treatment plant or recipient must not be discharged into drainage systems or main drainage systems.

(2) Covers must:
   (i) be made, located and fixed in such a way that there is sufficient protection against accidents;
   (ii) have the strength to resist the loads to which they are subjected; and
   (iii) be fitted such that the loads that arise do not harm the drainage systems.

(3) If there is a risk of backing-up in the main drainage systems, drainage systems must be designed so that backing-up cannot cause harmful flooding in the building.

(4) Drainage systems must be designed so as to prevent overflows into the water supply and plumbing systems, and into any other drainage system or other plumbing system component.

(5) If the main drainage systems are built as a separate system, the drainage systems must also be built as a separate system.

GUIDANCE

(8.4.3.2(1)) Pursuant to the Environmental Protection Act, the local council may impose requirements in respect of the foul water discharged to main drainage systems. Substances that can damage or impair the functioning of drainage systems, wastewater treatment plants or recipients must be retained by separators or be neutralised.

(8.4.3.2(2)) Provision must be made to permit covers to be handled appropriately in accordance with The Danish Working Environment Authority’s regulations.

(8.4.3.2(3)) Protection against backing-up is normally provided by:
   - Sufficient difference in level between the highest surcharge in the main drainage system and the soffit of the lowest system component
   - Pumping
   - Anti-flood valve
If required by the local council, the necessary ventilation of main drainage systems must be provided through the drainage system of a property.

### 8.5 Combustion plants and exhaust systems

#### PROVISION

(1) Central heating boilers, small-scale CHP plants (combined heat and power), generator systems, bio-fuel systems, wood-burning stoves, fireplaces and other combustion plants must be built and installed to prevent the danger of fire, explosion, poisoning and health nuisance.

#### GUIDANCE

(8.5(1))

Central heating systems with boilers must be designed in accordance with the WEA Guideline B. 4.8 *Indretning og anvendelse af fyrede varmeanlæg* [Design and use of fired heating systems].

For combustion plants with motorised moving parts; see the Executive Order on the Design and Layout of Technical Equipment.

See also executive orders on the design of pressure equipment and the use of pressure equipment and Executive Order on the Design, Construction and Operation of Oil Tanks, Pipe Systems and Pipelines.

For gas-fired systems; see the Danish Gas Regulations.

With regard to emissions from combustion plants, see the relevant requirements issued by the Danish Environmental Protection Agency.

(2) Materials with the necessary resistance to flue gases, fire, heat and corrosion must be used.

### 8.5.1 Combustion plants

#### 8.5.1.1 General

#### PROVISION

(1) Combustion plants must be designed and installed such that they can be cleaned without difficulty.

#### GUIDANCE

(8.5.1.1(1))

See the Executive Order on the Inspection of Boilers and Heating Systems in Buildings.

(2) Combustion plants must be airtight and arranged to achieve good combustion.

(3) The combustion plant must have an adequate supply of air for combustion.

(4) Combustion plants must be constructed such that, under normal operating conditions, there is underpressure in the combustion chamber and exhaust relative to the room/space in which the combustion plant is installed. Derogation from this requirement is possible in the case of specially sealed boilers designed for overpressure combustion and fitted with an airtight exhaust or installed away from habitable rooms and workrooms in a special room with unblockable ventilation openings to the outside.

(5) Combustion plants must not be installed in rooms containing readily combustible material without a satisfactory fire-resisting separation.

(8.5.1.1(3))

Adequate air for combustion can be achieved by installing the combustion plant in a room fitted with an adjustable fresh air vent or by supplying the combustion chamber with air through a duct from the outside. See also 8.3(2).

(8.5.1.1(4))

Particularly airtight construction of the exhaust system is achieved by using an exhaust that meets at least airtightness class P1; see 8.5.3.2(1).

In overpressure combustion systems, double walls exhaust systems should be used. It should be ensured on installation that the draught in the chimney meets the minimum requirements stated in the boiler installation instructions. If not, the draught should be improved or fitted with a smoke extractor.

(8.5.1.1(5))

A fire-resisting separation may, for example, consist of walls and suspended upper floors of no less than building element class EI 60 A 60-s1,d0 [BS building element 60] and with fire doors of no less than door class EI2 30-C [BD door 30].
In connection with the erection of new buildings, central heating boilers designed for firing with natural gas or fossil oil are not allowed to be installed for heating the buildings, but see 8.5.1.1(7).

The provision applies to the erection of new buildings, see section 2(1)(a) of the Danish Building Act, and thus has effect in relation to all buildings. The provision also applies to extensions where the new building element involves the installation of a new central heating boiler. Whether the extent of a conversion project is comparable with the erection of a new building depends on a specific assessment in pursuance of section 2(1)(b) of the Building Act. Big buildings may in some circumstances be fitted with collective heat supply systems, which are regulated by the Danish Heat Supply Act. Such collective heat supply systems are not covered by this provision.

Exemption from 8.5.1.1(6) may only be granted if, subject to a specific assessment, circumstances exist which make alternatives to central heating boilers designed for firing with natural gas or fossil oil unsuitable for the building in question. In granting exemption, the local council may emphasise, for example, that one or more of the following factors make the installation of an alternative to central heating boilers designed for firing with natural gas or fossil oil unsuitable for the building in question:
- Plot size.
- The location of the building on the plot.
- Neighbour considerations.
- Local development plans for district heating.
- Intended building use.

Exemption from the prohibition against the installation of natural gas burners applies in areas where the local council has decided conclusively prior to 1 January 2013 that buildings should be given the option of individual natural gas supply. In these areas, the installation of natural gas burners will thus be allowed in new buildings, see section 2(1)(a) of the Danish Building Act. Since the implementation of the project system in 1990, the local council must decide to introduce individual natural gas supply in an area in compliance with the requirements of the project order issued under the Danish Heat Supply Act. Before the implementation of the project system in 1990, an area could also be designated for collective heat supply under a general local heat plan or local plans. In such areas, the exclusion provision only applies if the area has already established a natural gas grid.

Exemption may only be granted when all relevant alternatives have been examined and found unsuitable. Relevant alternatives can for example be heat pumps, wood pellet burners or district heating. Exemption may for example be granted in the event of the re-erection of a building without access to district heating where the size of the plot is too small for geothermal heating, where noise considerations make it inappropriate to install an air/water heat pump, where there is insufficient space for installation of a wood pellet burner, or where the location of the building on the plot precludes the use of solar energy.

In assessing the different factors, the following may be taken into account:

**Plot size.**
The plot is too small for installing underground piping for a geothermal heating system.

**The location of the building on the plot.**
The building must be located in a way that would prevent solar collectors and solar cells from generating a sufficient yield to meet the energy consumption of the building. There may, for example, be local plans that preclude the building from being located anywhere on the plot.

**Neighbour considerations.**
The building is located so close to neighbours that air/water heat pumps cannot be installed without causing noise nuisance to the neighbours. This may be the case of buildings where the boundary is close to the building.

**Local development plans for district heating.**
The area in which the building is to be located will, within a few years, be supplied with district heating, which will be more beneficial than installing, for example, geothermal heating in the building.

**Intended building use.**
The use of the building involves, for example, the consumption of large quantities of very hot water, which cannot be met by renewable energy sources. Another situation could be a new building of a temporary nature (for example a temporary cabin for a school) which will be removed after a few years.
8.5.1.2 CHP appliances

PROVISION

(1) CHP appliances must comply with the requirements set out in EU Regulation No 813/2013/EU.

GUIDANCE

(8.5.1.2(1))
For information on small-scale gas-fired CHP plants; see the Danish Gas Regulations.
For information in respect of electricity; see section 6 of the Danish Heavy Current Regulations. See especially Part 551.
CHP appliances are cogeneration units with a maximum capacity of 50 kWe, and a maximum input capacity of 70 kW.

(2) Exhaust systems from small-scale CHP plants (combined heat and power) must not be connected to the flue from other combustion plants. Access must be provided for cleaning the flue.

(3) Plants with a heat output of more than 30 kW must be installed in their own fire-resisting units.

8.5.1.3 Wood-burning stoves, pellet stoves, massive stoves and fireplaces

PROVISION

(1) The floor below and around wood-burning stoves, pellet stoves, massive stoves and fireplaces must be non-combustible or clad with a non-combustible material to prevent sparks from starting a fire.

GUIDANCE

(8.5.1.3(1))
In respect of the separation distance to combustible materials, see 8.1.
Compliance with the provisions of 8.5.1.3(1) can be achieved by, for example, the non-combustible material extending no less than 300 mm in front of closed combustion plants and no less than 500 mm in front of open combustion plants (fireplaces).
The material should also extend no less than 150 mm to each side of the opening of the combustion plant.

(2) Wood-burning stoves, massive stoves and fireplaces may be fitted with manually operated smoke dampers which ensure an air passage of no less than 20 cm² in the closed position.

(3) Water tanks in fireplaces and wood-burning stoves must not be connected to sealed central heating systems. However, this provision does not apply if each boiler (heat-emitting unit) is fitted with a safety valve.

(4) Fireplaces and wood-burning stoves must not be connected to exhausts from gas-fired equipment or exhausts from oil-fired equipment complying with the requirements of 8.5.1.4(2), or to exhaust systems connected to boilers designed for overpressure combustion.

8.5.1.4 Requirements for central heating boilers, oil-fired burners etc.
(1) When central heating boilers with an oil-fired burner or forced-air gas burner are installed, the burner must be fully commissioned.

(2) Gas- and oil-fired boilers must comply with the requirements set out in EU Regulation No 813/2013/EC.

(3) The provisions of 8.5.1.4(2) apply to boilers with an effective rated output of up to 400 kW.

(4) When existing boilers are replaced, the useful efficiency at both full and part load must as a minimum correspond to the provisions of 8.5.1.4(2).

(5) Oil-fired boilers that comply with the provisions of 8.5.1.4(2) must not be connected to chimneys that serve other heating appliances.

(6) Boilers stoked by coal, coke, bio-fuels and biomass must at least comply with the useful efficiency requirements for boiler class 5 in DS/EN 303-5 Heating boilers for solid fuels, hand or automatically stoked, nominal heat output of up to 500 kW – Terminology, requirements, testing and marking. Systems not covered by the safety requirements as set out in EU legislation must comply with the safety requirements in DS/EN 303-5 Heating boilers for solid fuels, hand or automatically stoked, nominal heat output of up to 500 kW – Terminology, requirements, testing and marking. The provisions do not apply to straw-fired boilers with an input power of below 130 kW, designed for firing with small bales.

(7) Detachable, readily replaceable burners for solid fuel must comply with DS/EN 15270 Pellet burners for small heating boilers – Definitions, requirements, testing, marking.

(8) Oil-fired hot air units for heating buildings must comply with the requirements for air heaters set out in DS/EN 13842 Oil fired forced convection air heaters – Stationary and transportable for space heating.

(9) Oil burners must comply with the requirements in DS/EN 298 Automatic burner control systems for burners and appliances burning gaseous or liquid fuels and DS/EN 267.
8.5.1.5 Large central heating boilers

PROVISION

(1) Large central heating boilers must be thermally insulated such that the surface temperature on their external surfaces, apart from hatches, etc., does not exceed 35°C at a room temperature of 20°C.

GUIDANCE

(8.5.1.5(1)) Large central heating boilers are boilers whose effective rated output exceeds 120 kW. In most cases, the manufacturer will be able to provide information on the maximum output. A number of European standards set other limits with regard to boiler sizes. Temperature conditions are advisory and apply to flue gas coolers if the following conditions exist:
- Return temperature at \(-12°C\) outdoors:
  - For gas boilers, no more than 45°C
  - For oil-fired boilers, no more than 40°C

(2) Large oil and gas-fired central heating boilers with an effective rated output of more than 400 kW must have a flue gas loss of no more than 7% at full load and must be fitted with flue gas coolers if temperature conditions in the heating systems to which they are connected are appropriate.

(3) Large central heating boilers must be provided with monitoring points and measuring equipment to monitor energy-efficient operation.

(4) Large central heating boilers must be installed in rooms/spaces that form an independent fire-resisting unit. The fire-resisting unit must not have doors leading directly to a shared access route and must not be used as a workroom or for purposes that can constitute a fire hazard. There must be easy, unobstructed access directly to the outside from systems above 400 kW.

(5) Large central heating boilers designed for excess pressure combustion may only be installed in rooms fitted with unblockable ventilation openings to the outside.

8.5.1.6 Combustion plants for commercial use and special bio-fuelled systems

PROVISION

(1) The local council may impose special requirements in respect of combustion plants etc. used for commercial purposes, and in respect of straw-fired systems and special bio-fuelled central heating boilers.

GUIDANCE

(8.5.1.6(1)) Special bio-fuelled systems mean, for example, dryers for grain, seeds and green crops, flue plants and hot oil plants.

(2) Derogation from the provisions of 8.5.1.5(4) is possible for oil and gas-fired hot air units with an effective rated output not exceeding 400 kW used to heat workrooms and for combustion plants used in commercial production plants.

(3) Combustion plants for commercial use and special biofuel systems must be connected to their own exhaust systems, which do not receive exhausts from other appliances.

8.5.2 Connection to exhaust system
(1)  The cross-sectional area of an exhaust systems must be commensurate with the input power. If several combustion plants are connected to the same exhaust system, the cross-section must be calculated in proportion to the combined power of the appliances.

(2)  Open combustion plants (fireplaces) may only be connected to their own discrete exhaust systems with no flues from other combustion plants. The opening of the exhaust system must be no less than 300 cm². If the opening of the fireplace is not greater than 2,500 cm², the chimney opening may be reduced to 175 cm².

8.5.3 Exhaust systems

8.5.3.1 General

(1)  Exhaust systems must be made and installed so as to prevent the danger of fire, explosion, harmful condensation, poisoning and health hazards.

(2)  Exhaust systems must be designed so as to be able to withstand the flue gas temperature of the combustion plant.

(3)  Exhaust systems from oil and solid fuel boilers must be built such that flue gases are removed vertically and must have appropriate height, location, form, and opening to permit a satisfactory draught, and to prevent the smoke discharge from causing a nuisance in the surroundings.

(8.5.3.1(1))  Penetrations must not impair the fire resistance of building elements, as this increases the risk of spread of fire through the building. If a building element is penetrated by a CE marked exhaust system, this must be tested for insulated (not ventilated) penetrations of building elements. The testing must be shown in the manufacturer's documentation. If a building element of class REI 30 [BD 30 building element] is penetrated by a shaft containing a chimney, the shaft may consist of a class EI 30 building element [BD 30 building element]. Flues should be only installed in the installation room. See DS/EN 1443 Chimneys – general requirements and relevant product standards.

(8.5.3.1(2))  If solid fuel is used to fire a boiler, the requirement is deemed to be satisfied without any additional measures if exhaust systems of a temperature class (see DS/EN 1443) of T 400 is used.

(8.5.3.1(3))  Exhaust systems from solid fuel burning equipment should always be higher than the highest point of the building. To comply with the requirements of the Danish Environmental Protection Act, the dissipation conditions, i.e. turbulence from buildings and vegetation, distance from and height of surrounding buildings and the prevailing winds in relation to neighbours, should be taken into account when determining the height of flues, especially for wood-burning stoves and other solid fuel burners. If a combustion plant causes significant smoke nuisance to the surroundings, the Danish Environmental Protection Act allows the local council to require combustion plants and exhaust systems or the fuel itself to be altered so as to eliminate the nuisance. If the nuisance cannot be remedied, the local council may prohibit the use of the
Access must be provided for cleaning the exhaust system. The size of a cleaning hatch must be no smaller than the opening of the exhaust systems. (8.5.3.1(4))

Exhaust systems for heating appliances fuelled with oil or solid fuel must be cleaned by a chimney sweep; see the Executive Order on Fire Precautions for Chimneys and Heating Appliances. Possibility of cleaning flue pipes may be ensured by installation of a cleaning hatch on the pipe.

Provision must be made to permit external inspection of the exhaust system. (8.5.3.1(5))

To prevent carbon monoxide seeping into the building, it is important to be able to detect any cracks and leakage in the exhaust systems in good time.

If the exhaust system is designed for cleaning from the top, safe access must be provided for the purpose.

8.5.3.2 Tightness and resistance

PROVISION

(1) Exhaust systems must be sufficiently airtight to prevent flue gases and steam from escaping and damaging the exhaust system or building. (8.5.3.2(1))

Exhaust systems designed for a negative pressure should be no less than tightness class N1. Chimney linings designed for a negative pressure should be no less than tightness class N2. Exhaust systems designed for a positive pressure should be no less than tightness class P1.

(2) Exhaust systems forming part of oil or solid fuel systems must be able to withstand a soot fire. This provision does not apply to exhaust systems used for boilers run on pure mineral oil and fitted with flue gas temperature protection. The protection must under all conditions interrupt combustion at a flue gas temperature corresponding to the temperature classification of the exhaust system, but no more than 200°C. The protection must be manually connected when a fault is identified. (8.5.3.2(2))

An exhaust system is resistant to a soot fire if it has class G classification in accordance with the relevant product standards. The flue gas temperature protection should be installed in the boiler's outlet stub and be electrically coupled to its safety circuits.

(3) Materials with the necessary resistance to flue gases, heat, corrosion and, as appropriate, soot fire must be used. (8.5.3.2(3))

This provision allows the use of plastic exhaust systems with boilers with low flue gas temperatures, typically lower than 120°C, and which will burn pure mineral oil. If CE marked plastic exhaust systems are used, these must have a resistance to corrosion of no less than class 2 in accordance with the corrosion declaration of the product standard. The flue must have the necessary resistance to environmental effects such as UV radiation.

If CE marked steel exhaust systems are used, these must be of material type L40 or better with a wall thickness no less than 1.0 mm, or of material type L50 or better with a wall thickness no less than 0.40 mm. Alternatively, corrosion resistance can be demonstrated by corrosion testing and certified according to fuel type. This provision does not, however, apply to flues connected to wood-burning stoves, pellet burners and fireplaces with a chimney, and where the risk of the occurrence of condensation can be excluded.

If CE marked concrete exhaust systems are used, they must have a corrosion resistance of no less than class 3 when connected to oil or solid fuel fired combustion plants.

(4) Exhaust systems used in connection with combustion plants with condensing operation or combustion plants whose flue gases condense in the flue, must be resistant to condensation and diffusion of moisture. Exhaust systems

(8.5.3.2(4))

Exhaust systems can withstand condensation and diffusion of water vapour if it is W certified.
must be laid out such that condensation is collected and discharged.

8.5.3.3 Protection against injury by contact

PROVISION

(1) The surface temperature of an exhaust system must not exceed the maximum permissible temperature set by the product standard in normal operation.
If the exhaust system is placed in a shaft to satisfy the temperature requirement, the shaft must be installed in accordance with the CE marking and the manufacturer's instructions.
This provision does not apply to that part of the exhaust system which is in the room/space in which the heating appliance is installed.

GUIDANCE

(8.5.3.3(1)) For an exhaust system in a shaft, the shaft should be ventilated and should enclose the exhaust system at all points where the exhaust system is inside the building, including, for example, a non-habitable roof space.

8.5.3.4 Small exhaust systems

PROVISION

(1) Series-produced small exhaust systems must be either CE marked if a relevant product standard exists.

GUIDANCE

(8.5.3.4(1)) The CE marking must state that the exhaust system is suitable for the intended use. Thus, an exhaust system that is CE marked for use in connection with gas boilers is not suitable for other purposes. Small exhaust systems are exhaust systems of any type that receive the exhaust from one or more combustion plants whose total effective rated output does not exceed 120 kW. For exhaust systems that are not series-produced, the manufacturer must be able to demonstrate to the local council that the choice of materials, wall thickness, sizing etc. of the exhaust systems are adequate.

8.5.3.5 Exhaust systems for roof cladding with insufficient fire resistance

PROVISION

(1) In connection with roof claddings which cannot be classified as roof cladding class BROOF (t2) [class T roof cladding], exhaust systems must be made and installed in such a way that sufficient protection against fire is provided.

GUIDANCE

8.6 Solar heating systems, photovoltaic arrays, cooling systems and heat pumps

8.6.1 General

PROVISION

(1) Solar heating systems, solar photovoltaic arrays, cooling systems and heat pumps must be made and installed so as to avert any danger of fire, explosion, poisoning and health hazards, for example in the form of noise or vibrations.

GUIDANCE

(8.6.1(1)) See also executive orders on the design of pressure equipment and the use of pressure equipment. See also the DS/EN 378 series on refrigerating systems and heat pumps. For the installation of geothermal heating systems; see the Executive Order on Geothermal Heating Systems. For gas-fired systems; see the Danish Gas Regulations.

(2) Materials with the necessary resistance to flue gases, fire, heat and corrosion must be used.
8.6.2 Solar heating systems

PROVISION

(1) Photovoltaic arrays must be built such that they do not give rise to temperature-related personal injury or damage to buildings.

GUIDANCE

(8.6.2(1)) Photovoltaic pipes can reach over 85-100°C and should therefore not be placed in contact with combustible materials, including timber structures. Preventive measures must be taken against the risk of scalding from domestic hot water.

8.6.3 Solar photovoltaic arrays

PROVISION

(1) Solar photovoltaic arrays must be built such that they do not give rise to temperature-related damage to buildings.

GUIDANCE

(8.6.3(1)) Solar photovoltaic arrays are low voltage generator systems. See section 6 of the Danish Heavy Current Regulations. Electrical services See also section 6A of the Danish Heavy Current Regulations.

8.6.4 Heat pumps and cooling systems

PROVISION

(1) If the system uses hazardous liquids or gases and the room is therefore classified as an explosion hazard, the system must be suitably and safely located.

(2) Heat pumps must comply with the requirements set out in EU Regulation Nos. 813/2013/EU and 2006/2012/EU. Efficiency requirements must be met in the heating situation. Systems which fall outside the scope of the regulations mentioned above must also meet with the energy efficiency requirements specified in the regulations.

(3) The power consumption of heat pumps and cooling systems with an annual power consumption exceeding 3,000 kWh must be measured. Electric cartridge heaters, if applicable, must be fitted with hours-run meters or electricity meters. The provision applies to new buildings and to new installations in existing buildings.

(4) Meters used to measure power consumption, see 8.6.4(3) must have a satisfactory accuracy. If the measurement of power consumption in heat pumps or cooling systems forms the basis of the distribution of expenses, the electricity meter must be in accordance with the Executive Order on Metering Technology Control of Meters Used for Measuring Power Consumption.

GUIDANCE

(8.6.4(2)) In calculation of SCOP, adjustments cannot be made for reversible operation.

(8.6.4(3)) The provision does not apply if an existing system is extended to supply an extension or existing premises.

(8.6.4(4)) The requirement is deemed to be met if type-approved meters or meters with an equivalent accuracy are used.

8.7 Waste disposal facilities

PROVISION

GUIDANCE

(1) Waste disposal facilities must be installed with due regard
to health and safety and make the greatest possible provision for refuse systems that promote recycling.

(2) Provision must be made in or for all buildings for handling, sorting, storing, disposing of and transporting refuse safely. The number of containers, boxes, etc. and the necessary amount of space for sorting refuse into several fractions must be determined by the local council.

See WEA Guideline D.2.24 Indretning og brug af renovationssystemer [Arrangements for and use of refuse disposal systems].

(3) Refuse containers, boxes etc. must be located at the same level as the vehicular access for refuse collection or such that the refuse can readily be collected with the aid of suitable equipment.

(4) If rooms are provided in the building for storage of refuse, the floor, walls and ceiling must as a minimum constitute a fire-resisting unit.

(5) The requirements for ventilation in refuse storage rooms are:
1) Fresh air supply: grille or other opening to the outside at floor level. The opening area must be able to supply a flow corresponding to the extracted flow. In the case of an air supply system, the injection flow must correspond to the extracted flow.
2) Extraction: flow 1 l/s per refuse container, but no less than 15 l/s.

(6) Domestic buildings with three floors above ground level must have a refuse chute for each staircase.

(7) Refuse chutes and related ventilation ducts must be of appropriate fire-resisting construction. Trap doors must be of non-combustible materials and must not be installed inside the flats themselves. Refuse chutes must be ventilated by an extraction system combined with openings to the outside in the collecting boxes.

(8) The requirements for ventilation in refuse chutes are:
1) Fresh air supply: opening to the outside at floor level with an area of 25 cm² per collecting box.
2) Extraction: flow 80 l/s when a rubbish trap or door to the collecting box is open.

8.8. Lifts

PROVISION

(1) Lifts must be appropriately installed in a safe manner.

GUIDANCE

(8.8(1)-(7)) See the Executive Order on the Use and Installation of Lifts etc. Attention is directed to 3.2.2(6). The provisions apply to new buildings and to new installations in existing buildings.

(2) Lift shafts must have natural or mechanical ventilation. Plant rooms must be ventilated.

(8.8(2)) Lift shafts must have natural or mechanical ventilation. Plant rooms must be ventilated.

(3) Measurement of the total specific energy consumption must be performed as specified in VDI 4707 Aufzüge Energieeffizienz, März 2009.

(8.8(3)) The specific energy consumption can be determined on the basis of an energy consumption measurement as specified in VDI 4707. The lift installer is responsible for ensuring and being able to document that the lift complies with the provision of 8.8.(5). Energy consumption may advantageously be measured in connection with an end inspection in compliance with the rules of the Danish Working Environment Authority. Regardless of documentation, it must be possible to measure consumption as specified in VDI 4707. When the European standard, EN ISO 25745 Energy efficiency of lifts and escalators, has been finalised, this standard is intended to serve as a basis for amending the provisions.

(4) The expected daily hours of use or the expected usage category must be stated by the building owner. The power consumption of lifts based on the expected daily hours of use must be stated. Standby consumption must also be stated. Consumption must be measured.

(8.8(4)) The power consumption of lifts does not include power consumption for heating and, if applicable, cooling lift shafts and power consumption for ventilation of shafts. Power consumption for these purposes is covered by the other provisions of Parts 7 and 8. Nor does power consumption include lighting in front of shaft doors on each storey.

(5) Lifts are divided into the following five usage categories based on daily hours of operation:

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Low</td>
<td>Rare</td>
<td>Occasional</td>
<td>Frequent</td>
<td>Very frequent</td>
</tr>
<tr>
<td>Daily ours of use</td>
<td>0.2 &lt;t&lt;0.3</td>
<td>0.5</td>
<td>1.5</td>
<td>2&lt;t&lt;4.5</td>
<td>4.5&lt;t</td>
</tr>
</tbody>
</table>

(8.8(5)) In Denmark, usage categories 4 and 5 will be rarely used. Table 5 of Appendix 6 provides examples of the classification of buildings into the 5 categories.

(6) For lifts in new buildings and in connection with the installation of new lifts in existing buildings, the total specific energy consumption may not exceed Class B in Table 8 of Annex 6, regardless of usage category.

(8.8(6)) The provision means that the lift meets the specific energy consumption requirement for energy class B in accordance with VDI 4707 Aufzüge Energieeffizienz, März 2009. The specific energy consumption can be determined on the basis of a measured reference trip as described in Appendix 6. The specific energy consumption is derived by dividing the measured consumption with the rated load and the trip distance.

(7) The provision of paragraph 5 does not apply to lifts where the car has a rated load of more than 1,600 kg.

(8.8(7)) The provision means that, for example, goods lifts and large bed passenger lifts are excluded from the provisions.
Appendix 1

Calculation rules

B. 1.1 Calculation rules

B. 1.1.1 Calculation of plot ratio

(1) The “plot ratio” means the floor area as a percentage of the plot area.

Exemption may not be given from the calculation rules in the Building Regulations, nor may a local plan or a town planning by-law apply other calculation rules.

B. 1.1.2 Calculation of plot area

(1) The area of the plot is the area stated for the relevant title number.

(B. 1.1.2(1)) Combined real property is defined in the Danish Parcellation Act.

(2) The area of roads and/or other land which cannot be built on because of the radius of corners or building line requirements which protect the road layout must be included in the plot area for calculation of the plot ratio.

(B. 1.1.2(2)) When determining the size of the plot in accordance with 2.2.2, the area of roads and/or other land which cannot be built on because of the radius of corners or building line requirements which protect the road layout must not be included.

(3) The size of the plot includes:
- The proportion benefitting the plot in a separately registered area which is established as communal open space shared by several properties. The shares of the separately registered open space must be apportioned to the properties in direct proportion to the size of each plot unless the local council decides otherwise in each individual case; this may include using an alternative distribution norm or excluding the portions of the communal open space from the calculation.
- Areas surrendered for roads before 1 February 1977, but which may still be included in the area of the plot. Such areas must be included in accordance with the conditions of the permit; and
- The total area under several title numbers when together they form a single property and adjoin each other.

(B. 1.1.2(3)) The provision that the local council can decide that a different distribution norm should be used, or that shares of communal open spaces should not be included, must be specifically stated in the local plan. This provision ensures that previously established rights to include an area of road in the area of the plot are upheld, irrespective of whether the area has been surrendered for road purposes. The agreements made between the local council and the owner of the plot are made available both as registered declarations on the individual properties and as entries on the title register, and are assumed to be used mainly in Copenhagen and Frederiksberg, typically in the case of roads whose width is greater than 20 m.

(4) The size of the plot does not include:
- areas of the plot situated in another zone than the one in which building work is to take place; and
- title numbers that are a part of a total real property but which do not adjoin each other.

(B. 1.1.2(4)) Areas that form part of a total real property, and which are separated by a road from the area on which the development is proposed, may be included in the size of the plot if the separation is solely due to the road or path. More distant areas, on the other hand, cannot be included.

(B. 1.1.2(4)(i)) See the Planning Act for zoning.

B. 1.1.3 Calculation of floor area
(1) Floor area is calculated by adding the gross areas of all storeys, including basements and useable roof spaces, enclosed balconies, conservatories, connecting passages etc.

(2) Rooms/spaces which rise through several storeys are included only in the storey on which the floor is situated. Both external and internal staircases, stairwells, access balconies and lift shafts are, however, included in each storey.

(3) The floor area does not include:
- any part of the basement around which the surrounding ground level is less than 1.25 m below the ceiling of the basement;
- open balconies;
- small buildings with a floor area of up to 10 m²;
- blast/fallout shelters for buildings of a prescribed size for which blast/fallout shelters are required and public, officially approved blast/fallout shelters;
- mezzanine platforms (galleries/sleeping platforms) with an area of up to 4.5 m²;
- the projection of external staircases and access balconies at ground level;
- external fire escape stairs (emergency escape route stairs).

(B. 1.1.3(2)) Service shafts are included for each floor.

(B. 1.1.3(3)) Service shafts are included for each floor.

(B. 1.1.3(3)) For private and public blast/fallout shelters, see the act on blast/fallout shelters, regulations for the design and fitting out of blast/fallout shelters and openings in masonry walls, together with the regulations for the design and construction of public blast/fallout shelters. Construction of more than two small buildings with a surface area of less than 10 m² must be included in the floor area.

The floors of mezzanine platforms (galleries/sleeping platforms) only include the area on a horizontal plane 1.5 m above the finished floor within the intersection of the plane with the outer surface of the roof cladding. There may be two or more mezzanine platforms (galleries/sleeping platforms) with an area of 4.5 m², but if they are not to be included in the floor area, they must not be internally connected, which means that there must be separate accesses to the mezzanine platforms (galleries/sleeping platforms).

(4) For garages, carports, outbuildings, greenhouses, sheds, open covered areas, including roofed-over terraces and similar buildings, only that part of the area need be included which exceeds:
- 20 m² per dwelling for multi-storey buildings and for joined buildings with vertical and horizontal party walls as well as terraced houses, linked houses, cluster houses and similar types of wholly or partly joined single-family houses;
- 35 m² per dwelling for detached single-family houses, semi-detached houses with vertical party walls and holiday homes; and
- 25% of the remaining floor area of the building for other buildings, but excluding garages/outbuilding areas in indoor or outdoor cellars/basements.

(B. 1.1.3(4)) Covered areas and roofed-over terraces are deemed to be open if at least one wall is wholly or partly open and cannot be closed by a window, door, etc. Equipment houses for electronic communications networks or services are not covered by this provision.

(B. 1.1.3(4)) Semi-detached houses with vertical party walls must be dealt with in accordance with B. 1.1.3(4)(ii) of this provision.

(B. 1.1.3(4)) The deductions are calculated irrespective of registration of title. (B. 1.1.3(4)) "Basements" is defined by the basement ceiling being less than 1.25 m above ground level. "Other buildings" means commercial or institutional buildings.
(5) The floor area is measured on a plane defined by the surface of the finished floor to the outer face of the limiting external walls, with the following exemptions:

- In useable roof spaces, the area to be included is measured on a horizontal plane 1.5 m above the finished floor to the intersection of the plane with the outer surface of the roof cladding.
- Open floors, doors/entryways, air locks etc. are included up to the line otherwise defined by the line of the external walls of the building.
- In the case of common walls between rooms whose areas are to be included in their respective floor areas, measurements must be made to the middle of the wall. However, in the case of party walls located on a boundary, measurements are made to the boundary line.

(B.1.1.3(5)) Roof space is deemed to be useable if accommodation space can be created without significant alteration to the roof construction.

B. 1.1.4 Calculation of height

(1) Heights are measured from the natural ground level. For buildings on sloping ground or sites with large differences in level planes, the local council determines one or more planes from which
measurements are to be made. The location of the level planes must be shown in an unequivocal manner on the building permit, normally by giving the levels of the planes. Several level planes may, where necessary, be specified for the same plot. When determining the level planes, the local council must take account of:
- the configuration of the ground of the adjoining plots and the nature of the surrounding buildings; and
- creating reasonable development possibilities and access conditions for the plot concerned.

(2) Buildings on sloping ground may be erected without determining level planes if the height, measured vertically from the natural ground level, does not exceed the building height limits set out in 2.2.3 and the distance from boundaries set out.

(B. 1.1.4(2)) The provision is designed to relieve local councils of their duty to determine the level planes of buildings on sloping ground, which unquestionably lie within the horizontal height-limiting plane in accordance with 2.2.3.

(3) Antennas whose upper point is not more than 5.5 m above the surface of the roof, dormers, chimney stacks, ventilation cowls, gables and roof overhangs are not factored into the calculation of a building height, provided they are not abnormally tall. When establishing the height of the building, the local council may also decide to discount stairwells, lift shafts, ventilation systems and signage and illuminated advertising.

B. 1.1.5 Calculation of separation distances

(1) Separation distances are measured horizontally without reference to differences in levels. The distance is measured at right angles to the opposing line (road line, common boundary) or buildings concerned, but may, for reasons of light conditions or in order to limit overlooking nuisances, be measured as the shortest clear distance between the building or building element and the opposing road line, common boundary or other buildings on the same plot. In the case of buildings without limiting external walls, the measurements are taken from the roof surface.

(2) The following may be excluded when determining the distance from a building to a boundary to a neighbouring property, road or path:
- basements, basement stairs, tanks, buried services, etc.; and
- roof overhangs, barge boards, canopies over doors, cornices and similar ancillary
building elements whose projection does not exceed 50 cm.

(3) When calculating the distance from a building to the road boundary, building projections over the road boundary are discounted as provided for in the Danish Public Roads Act and in the Danish Private Common Roads Act with the following relaxations and limitations:
- There must always be a clear passage of no less than 1.3 m between building projections and a carriageway or cycle track.
- Up to 2.8 m above ground level, building projections may extend up to 30 cm over the road boundary. - Light wells, foundations etc. located at or below ground level may extend up to 80 cm over the road boundary.
- Signs and lightweight awnings whose underside is no less than 2.2 m above ground level may extend up to 1.0 m from a carriageway or cycle track.
- Stairways must always allow a clear passage of no less than 1.3 m between the stairway and a carriageway or cycle track.

B. 1.1.6 Calculation of number of storeys

(1) Each floor of the building, including the ground floor, is to be included in the number of storeys as stated in the Building and Housing Register (BBR). The number of storeys also includes:
- usable roof spaces
- basements whose ceilings are more than 1.25 m above ground level.

(2) In the case of buildings with split-level or mezzanine floors etc., the local council determines the number of storeys on the basis of an individual assessment in the particular case. When counting occupiable areas in the lofts of the buildings or on the roof of the building, the local council may, subject to a specific assessment in each individual case, decide that a mezzanine platform (gallery/sleeping platform) with an area in excess of 4.5 m² or balconies, conservatories, terraces and similar occupiable areas constitute a storey.

B.1.1.5(3)) See section 103(1) of the Danish Public Roads Act.

B. 1.1.6(1)) Roof space is deemed to be useable if accommodation space can be created without significant alteration to the roof construction; see B. 1.1.3(5).

B. 1.1.6(2)) The calculation of the number of storeys may inter alia take account of the size and possible uses of the relevant functions of the building in relation to the total size and use of the building. Similarly, the external appearance of the building may be a factor, if, for example, the number and size of windows for the relevant function of the building may cause the building, by comparison with others in the area, to appear to have an extra floor; see 2.3. Significant overlooking nuisance associated with the relevant function of the building may also be a factor in relation to the area in which the building is situated. For example, a greater tolerance of overlooking nuisance is to be expected in taller, denser and more urban buildings than in lower and more detached residential areas.
**Table 1.**

Structures which may not be erected without prior building permit or certification in accordance with the Executive Order on Certification Scheme for Transportable Tents and Structures. The table also includes modular structures, the form and size of which mean that the structure exceeds the limits specified in the table.

<table>
<thead>
<tr>
<th>Transportable tents</th>
<th>Danish Building Act</th>
<th>Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>All tents of more than 1 storey</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>Tents for private use only, which are used by more than 150 persons</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>Tents which are not for private use with a total area of more than 50 m²</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportable structures</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stages (whether indoor or outdoor stage)</td>
<td>Comprised by the Danish Building Act</td>
<td></td>
</tr>
<tr>
<td>Uncovered, height of more than 1 m</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>All covered stages, regardless of the height of the stage</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Automobile stages</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of more than 1 m, whether covered or not</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>Grandstands, including automobile grandstands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncovered, seating height of more than 1 m</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>Covered, regardless of seating height.</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Portal structures</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>With and without covering</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Footbridges</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. height of 1 m without traffic below the footbridge and with cover</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>Height of more than 1 m without traffic below the footbridge whether with or without cover</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>More than 1 m in height with traffic under the footbridge, whether covered or not</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Towers and similar self-standing structures</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Without passage below or through the structure</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>With passage below or through the structure</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
<tr>
<td>With passage below or through the structure</td>
<td>Comprised by the Danish Building Act</td>
<td>Requirement for either certification or building permit</td>
</tr>
</tbody>
</table>
Table 2.
Structures which may be erected without prior building permit or certification, but which fall within the scope of the Danish Building Act and which must therefore comply with the rules of 3.2.1, 4.1-4.3 and 5.

<table>
<thead>
<tr>
<th>Transportable tents</th>
<th>Comprised by the Danish Building Act</th>
<th>Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tents for private use only, which are used by up to 150 persons</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
<tr>
<td>Tents which are not for private use with a total area of less than 50 m²</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transportable structures</th>
<th>Comprised by the Danish Building Act</th>
<th>Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stages (whether indoor or outdoor stage) Uncovered, height of max. 1 m</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
<tr>
<td>Automobile stages Height of max. 1 m, whether covered or not</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
<tr>
<td>Grandstands, including automobile grandstands Uncovered, seating height of max 1 m</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
<tr>
<td>Footbridges Max. height of 1 m without traffic below the footbridge and without cover</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
<tr>
<td>Site huts, wheeled facilities, containers, etc., structures with external walls of solid material (wood, steel, etc.) erected for temporary use as places of public assembly. (Regardless of whether the structure is on wheels or not and regardless of whether the structure is used for accommodation)</td>
<td>Comprised by the Danish Building Act</td>
<td>No requirement for building permit or certification</td>
</tr>
</tbody>
</table>

Appendix 3

Certification of structural engineers

A. Certification of structural engineers

The Danish Society of Engineers (IDA) is authorised by the Danish Transport and Construction Agency to certify structural engineers within the following terms of reference:

1 Validity

(1) Scope

Structural engineering certification is issued where the structural engineer is practising in Denmark and meets the criteria set out in 4.

(2) Definitions

The following designations are used:

- ‘certified structural engineer’ for individuals who have been professionally assessed and certified in accordance with these guidelines;

- ‘outside Denmark’ for any other EU member state, any EEA country or any other country with which the EU has an agreement granting the right to practise as a certified structural engineer;

- ‘competent authority’ for the authority which governs the profession of certified structural engineers ‘outside Denmark’.

2 Certification

(1) Purpose

The purpose of certification of structural engineers is

- to ensure the quality of the design and execution of load-bearing structures in buildings;

- to facilitate the work of the building authorities without detriment to the structural documentation of construction projects.
The title ‘certified structural engineer’ may be conferred for limited periods at the discretion of the certifying body indicated in 3.1. Such certification is personal and follows the certified structural engineer irrespective of his or her employment.

(3) Terms of reference for certified structural engineers

The certified structural engineer is responsible for working exclusively within the terms of reference specified by the certifying body (see 3(3)) and not to make use of the certification outside these terms of reference.

3 Certifying body

(1) Certifying body

The certifying body is the Executive Committee of The Danish Society of Engineers, whose role it is to set up a certification scheme and verify its compliance with DS/EN ISO/IEC 17024 Conformity assessment – General requirements for bodies operating certification of persons.

(2) Certification committee

For the performance of its duties the certifying body appoints a committee of 9 members as follows:

- 3 members nominated by the Danish Transport and Construction Authority mainly from employees of relevant research and educational institutions;
- 2 members nominated by the Danish Association of Consulting Engineers (FRI);
- 2 members nominated by the National Association of Local Authorities in Denmark (KL);
- 1 member nominated by the Danish Association of Certified Structural Engineers; and
- 1 member nominated by the Danish Construction Association.

Members are appointed for terms of 4 years and are eligible for reappointment twice for a maximum term of office of 12 years in total. Members must be suitably qualified within the field of load-bearing structures, for example as certified structural engineers.

(3) Rules of procedure

The certifying body lays down detailed rules for the implementation of the scheme and describes them in procedural rules which must

- comply with DS/EN ISO 9001:2015, Quality management systems, and DS/EN ISO/IEC 17024; see 3.1;
- be accessible to the public;
- provide guidance for applicants and notifiers on procedures, rights and obligations;
- provide guidelines for the practice of certified structural engineering; and
- advise certified structural engineers as to their obligations in respect of applications for building permits.

(4) Details of certified structural engineers

The certifying body must publish details of the individual certified structural engineer, including the duration of the certification, the country by which it was issued, the training and qualifications of the certified structural engineer concerned and his or her professional title.

If the certification was issued outside Denmark, the relevant competent authority in the country concerned must be identified.

4 Obtaining certification in Denmark

(1) Application
Certification is granted at the discretion of the certification committee on the basis of the application received.

It is the responsibility of the certifying body to scrutinise and assess the information indicated in 4.2 and 4.3 and on that basis decide whether to issue certification.

The certifying body can seek further information from Danish and foreign authorities in support of the certification, which must be accepted by applicants.

The certification committee must deliver its decision on certification no later than six months from receipt of the application and all necessary documents.

This deadline may be extended once, if warranted by the complexity of the case. The applicant must be informed of any such extension, and of its duration, before the expiry of the original deadline.

On receiving an application for certification, the certification committee must send a receipt to the applicant, giving details of the deadline for a decision and the scope for appeals.

(2) Academic qualifications for certification
Certification can be issued to engineers with one of the following Danish degrees: Master of Science in Engineering (M.Sc.(Eng.)), Bachelor of Science in Engineering with honours (B.Sc.Eng. (Hons.)) or Bachelor of Science in Engineering (BSc. (Eng.)).

The certifying body must give applicants who do not have any of the above qualifications the opportunity to take a test or examination to ascertain whether they have the requisite professional expertise.

(3) Details of practical experience required for certification
Details of the applicant’s work history in a given period leading up to the application are required for certification.

(4) Rejection
Should the certifying body reject the application for certification, the applicant must be given reasoned written notification.

5 Certified structural engineers from outside Denmark

(1) Practice as certified structural engineer
Engineers who have evidence of competence, academic qualification or other certificate which in another country, as stated in 1.2, authorises them to practise structural engineering in that country may practise as certified structural engineers in Denmark provided that the qualification or other certificate has been issued by a competent authority in that other country. A certified structural engineer from outside Denmark must work within the terms of reference for certified structural engineers in Denmark as specified by the recognising body.

(2) Temporary employment as or practice as a locum c.s.e. as certified structural engineer
Certified structural engineers from outside Denmark (see 1(2)) are entitled to provide services on a temporary or occasional basis as certified structural engineers in Denmark subject to confirmation by the recognising body in accordance with Article 7(1), (2), 2(a) and (4) of Directive 2005/36/EC of the European Parliament and of the Council, as amended most recently by Directive 2013/55/EU of the European Parliament and of the Council, on the recognition of professional qualifications in the European Union. The certified structural engineer must notify the certifying body of any temporary or occasional work undertaken. Before the certified structural engineer provides actual services for the first time in Denmark, the recognising body may check the professional qualifications of the certified structural engineer in accordance with Article 7(4) of the directive. The notification must be renewed once a year.

(3) Permanent appointment as certified structural engineer
Certified structural engineers from outside Denmark (see 1(2)) may be authorised to work on a permanent basis as a certified structural engineer in Denmark subject to the decision of the recognising body, see Title III, Chapter I, Articles 10-14 of Directive 2005/36/EC of the European Parliament and of the Council, as amended most recently by Directive 2013/55/EU of the European Parliament and of the Council on the recognition of professional qualifications in the European Union.

Applications for such authorisation must be sent to the certifying body. Within one week of receipt of the application, the certifying body must confirm the receipt of the application and inform the applicant of any missing documents. Within two months of submission of the application, the certifying body must present the applicant with its duly substantiated decision on permission for establishment or whether compensation measures are to be imposed on the applicant. The time limit may in special cases be extended by two weeks if there are special considerations for public health or the safety of the recipient of the
service. The time limit may only be extended once, and the applicant must be informed of the reason for this.

(4) Competences

Persons who fall within 5.2 and 5.3 and practise as certified structural engineers in Denmark must possess

– professional qualifications corresponding to the requirements in this Appendix and

– sufficient linguistic proficiency for proper practice as a certified structural engineer in Denmark in accordance with the Building Regulations.

The certifying body may verify the applicant's qualifications. The certifying body may also verify the applicant's linguistic proficiency in the event of serious and specific doubt about the sufficiency of the professional's linguistic proficiency.

(5) Adaptation period or aptitude test

In accordance with Article 14(1), (2), (4) and (5) of Directive 2005/36/EC of the European Parliament and of the Council, as amended most recently by Directive 2013/55/EU of the European Parliament and of the Council on recognition of professional qualifications in the European Union, the recognising body may, even if the applicant satisfies the conditions of 5(1), demand that the applicant completes an adaptation period, which must not exceed three years, or takes an aptitude test.

If the recognising body makes use of its right to demand an adaptation period or aptitude test, the decision by the recognition body decision must be duly substantiated.

The assessment of whether an applicant must complete an adaptation period or take an aptitude test must take into consideration whether the knowledge acquired by the applicant in the course of his professional experience or through lifelong learning in another country fully or partly compensates for the necessary qualifications.

It must be possible for the applicant to take the aptitude test no later than six months after the initial decision imposing an aptitude test on the applicant in accordance with Article 14(6) and (7) of Directive 2005/36/EC of the European Parliament and of the Council, as amended most recently by Directive 2013/55/EU on the recognition of professional qualifications in the European Union.

(6) Exchange of information

The certifying body may exchange information with competent authorities outside Denmark about:

- people from outside Denmark (see 1(2)) who wish to work as certified structural engineers on a temporary, casual or permanent basis in Denmark; see 5(2) and (3);

- certified structural engineers in Denmark who wish to work as certified structural engineers on a temporary, casual or permanent basis outside Denmark.

6 Renewal of certification

Certification can be renewed at the end of the period of validity on the basis of an application submitted by the certified structural engineer. Details of the applicant’s work history in the period leading up to such application provide the basis for any renewal of certification.

7 Withdrawal of certification

The certifying body may withdraw an individual's designation as ‘certified structural engineer’ in accordance with 2(3) subject to specific criteria.

8 Appeal

Applicants may appeal in writing to the certifying body in the event of refusal or withdrawal of certification and are entitled to argue their case in person before the certifying body.

9 Payment

The certifying body sets the costs of the certification scheme, including charges associated with the running of the scheme such that it is self-financing in the long term.

B. Certified structural engineers and building permits
10 Structural engineer's declaration

(1) Format of the structural engineer's declaration

In the case of applications for building permit from Danish building authorities which require the input of a certified structural engineer, the certified structural engineer in person draws up and signs a certified structural engineer’s declaration.

(2) Purpose of the structural engineer's declaration

The certified structural engineer’s declaration certifies that he or she has:
- worked within the terms of reference laid down by the certifying body;
- drafted the documents and appendices relating to the load-bearing structures of the building or verified that they comply with Appendix 4 of the Building Regulations;
- satisfied the requirements and guidelines of the certifying body in respect of certified structural engineering work and provided all such structural engineering services as may be appropriate for the project.

(3) Substance of the structural engineer’s declaration

The structural engineer’s declaration must:
- describe what the certified structural engineer has drafted or verified in accordance with SBi Guidelines 223;
- comply with the requirements specified by the certifying body and conform to specimen structural engineer’s declarations; and
- certify that the certified structural engineer has adhered to the provisions of 10(2).

11 Documentation provided by certified structural engineers

The certified structural engineer must provide the recipient of the structural engineer’s declaration with:
- a structural engineer’s certificate valid at the time of the signing of the structural engineer’s declaration; this may include complying with any request by reference to legal rules for structural engineering practice;
- any information about the organisation where the certified structural engineer’s practice is based and membership of any relevant professional organisations; and
- documentary evidence of professional and geographically adequate professional liability insurance and warranties for the structural engineer’s work on the project in question.

Such documentation must include contact details of the insurance company and the competent authority.

Appendix 4

Documentation for load-bearing structures

Purpose and responsibility

The purpose of the documentation for load-bearing structures, herein called "structural documentation", is to show that the load-bearing structures of the building comply with defined requirements for the strength and serviceability of load-bearing structures. The purpose of structural documentation is also to document those parts of the design which are significant in terms of the safety and usability of the building; this includes the organisation of the build, allocation of responsibilities and checks during design and inspections during construction.

The applicant is responsible for the structural documentation. The applicant must appoint a construction designer for the load-bearing structures with responsibility for collating and coordinating the structural documentation, such that it constitutes a coherent whole. The applicant may act as construction designer.

The structural documentation must be prepared and checked in accordance with the principles of SBi Guidelines 223 Dokumentation af bærende konstruktioner [Documentation for load-bearing structures].

The content of the structural documentation
The structural documentation consists of the following elements:

A. Structural documentation:
- A1. Background data
- A2. Structural design
- A3. Structural drawings and models
- A4. Structural alterations

B. Design documentation:
- B1. Structural design report
- B2. Structural check report
- B3. Structural inspection report

Appendices may be annexed to any of these elements.

The scope of structural documentation, and the parts that are relevant, depend on the project and the complexity and nature of the structures; see documentation classes in SBI Guidelines 223.

**Re A1. Background data**

A1. Background data must give a complete review of the basis of the project in all functional, technical and constructional terms, including the use of the building, functional requirements, fire, codes of practice, guidance notes/guidelines, IT tools, feasibility studies, main design of the structures, robustness, foundations, construction materials and loads. This serves both to ensure that all inputs into A2. Structural calculations are on a common basis, and to ensure subsequent understanding of the building. The document must be prepared at the commencement of design and updated on an ongoing basis.

**Re A2. Structural design**

A2. Structural calculations must demonstrate that the safety and use of the constructions in the building comply with codes of practice and standards and the requirements of the applicant and users based on A1. Background data. A2. Structural calculations are one or more technical documents that use calculations, subsequent conclusions, test reports and references attesting to compliance with the requirements. Structural calculations must include such relevant sketches and models, including details of joints, as are not included in A3. Structural drawings and models, and which are necessary for the understanding of A2. Structural design.

**Re A3. Structural drawings and models**

A3. Structural drawings and models must give a comprehensive picture of the layout of the structure, showing the location and dimensions of all structural elements used. Structural drawings can comprise plans, sections, elevations, details, etc. They may also comprise digital models of the structures, both plane and spatial.

**Re A4. Structural alterations**

A4. Structural alterations must demonstrate that structural alterations made after completion of A1 Background data and A2 Structural calculations do not cause unacceptable deviations in terms of the safety, use, buildability and durability of the structures.

**Re B1. Structural design report**

B1. The structural design report must give an overview of the nature, scope, organisation, allocation of responsibilities and checks during the design process to ensure that all relevant matters are covered by the construction documents. The document must be prepared at the commencement of design and updated on an ongoing basis. B1. The structural design report must contain as a discrete item an account of the allocation of responsibilities in connection with the preparation of structural documentation.

**Re B2. Structural check report**
**B2. The structural check report** must demonstrate that the structural documentation has been checked in accordance with the provisions of the structural design report. If **B1. Structural design report** refers to the quality management systems of the organisations participating in the design, compliance with such systems must be demonstrated. The construction designer is responsible for checking that contributions by other parties to the design, for example suppliers of building elements, contractors and consulting engineers, comply with the requirements of **A1. Background data and B1. Structural design report**.

Re **B3. Structural inspection report**

**B3. The structural inspection report** must demonstrate that the completed construction corresponds to the assumptions of the structural documentation in general. **B3. The structural inspection report** includes a specification of the scope of inspection, method of inspection and records of discrepancies.

**The form and handling of the structural documentation**

The structural documentation must be complete, consistent and cover the relevant structures. It must also be accessible, well structured and legible, and drawn up in Danish. **A2. Structural calculations, A3. Structural drawings and models and B2. Checking of structural documentation** may, however, be in English. Documents must be listed in document references, and all documents must be clearly identifiable and dated, all pages numbered and all references unequivocal etc.

If the structural documentation includes digital models and/or digital documents, these must also comply with the above requirements for the layout of the documentation. Separate documentation must state which technological platforms and systems are needed for reading and interpreting the digital information. If ICT tools are used for the structural calculations, printouts must be legible and comprehensible to an external structural engineer, and all necessary information, definitions and references to bases etc. must be stated in the documentation, for example assumptions, input data, algorithms and codes of practice used.

All parts of the structural documentation must be checked and documentary evidence supporting the outcome given. The requirements for such checks must be stated in **B1. Structural design report**.

All parts of the structural documentation, including any contributions from other parties participating in the design, must be signed by the individuals by whom they were prepared, checked and approved.

On completion of the building, and no later than on commissioning, the structural documentation must correspond to what has been built.

The construction designer coordinates and collates the structural documentation and signs **B1. Structural design report**.

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**Appendix 5**

**Guidance for applicants for building works covered by 1.3.1 and 1.3.2**

Applicants are responsible for the erection of the building in accordance with the requirements of the Danish Building Act and compliance with the provisions of the Building Regulations.

Applicants’ applications for a building permit must show that the building is covered by Section 16(7) of the Danish Building Act.

Before taking the building into use, applicants must send the local council all requisite documentation relating to technical requirements. Applicants are responsible for ensuring that all relevant material is sent to the local council. The local council is obliged to store such documentation but does not undertake any quality assurance or processing of the material for the application.

Applicants are encouraged to collaborate with a consultant to clarify which is the appropriate documentation for the building project in question. To clarify any uncertainties, applicants can also hold preliminary discussions with the local council.

On taking the building into use, applicants must provide a signed declaration to the effect that the building has been erected in compliance with the provisions of the Danish Building Act and Building Regulations and that the requisite documentation relating to technical requirements are appended to the declaration.

Examples of such documents relating to technical requirements as it may be appropriate to send to the local council are listed on Page 2 of this declaration.

**Declaration concerning technical documentation**

The undersigned applicant hereby declares:
That the building has been erected in accordance with the requirements of the Danish Building Act and the provisions of the Building Regulations.

That the requisite documentation relating to technical requirements is appended to this declaration.

Date:

Location of building:

Signature:

**Examples of documentation relating to technical requirements:**

- Drawings showing level access
- Drawings showing any sound insulation against neighbouring properties
- Drawings showing the tightness of the building where it is in contact with the soil
- Documentation showing that the load-bearing structures of the building satisfy the provisions of Part 4 of the Building Regulations and Appendix 4 relating to structural documentation, and that the structures have been erected in accordance with best building practice, such as indicated in SBI Guidelines 258, etc.
- Documentation showing that rafters were supplied ex factory
- Stability calculations
- Documentation showing that structures and materials are free of any moisture content which would risk the development of mould in the building once occupied (engineer’s report)
- Documentation showing that fire safety requirements have been met, achieving satisfactory levels of safety, e.g. in accordance with *Eksempelsamling for brandsikring af byggeri 2010* [Collated examples of fire safety measures in buildings 2010]
- Energy performance framework calculations
- Heat loss calculations (for conversions)
- Documentation relating to sewers/drainage
- Documentation relating to ventilation

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**Appendix 6**

Appendix 6 contains:

1. Lifetimes that can be used to calculate cost-effectiveness
2. Calculation of energy gain through windows
3. Assumptions used in the calculations associated with calculating the energy demands of buildings.
4. Various conditions for temporary portable cabins
5. Determination of the specific energy consumption for lifts

**1. Lifetimes that can be used to calculate cost-effectiveness**

**Table 1. Lifetimes that can be used to calculate cost-effectiveness:**

<table>
<thead>
<tr>
<th>Energy-saving measure</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retro-fitted insulation to building elements</td>
<td>40</td>
</tr>
<tr>
<td>Windows with secondary windows and coupled frames</td>
<td>30</td>
</tr>
<tr>
<td>Heating systems, radiators and underfloor heating and ventilation ducts and fittings including insulation</td>
<td>30</td>
</tr>
</tbody>
</table>
Heat appliances etc., for example boilers, heat pumps, solar heating systems, ventilation units 20
Lighting fittings 15
Automation for heating and climatic control equipment 15
Joint sealing works 10

2. Calculation of energy gain through windows

When replacing windows, it is cost-effective to use windows complying with the provisions of 7.6.

Facade windows
For facade windows, see EN 14351 - 1 Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics, the window manufacturer calculates the energy gain as:

\[ E_{\text{ref}} = I x g_w - G x U_w = 196.4 x g_w - 90.36 x U_w \]

where:
I: Sunlight corrected for the variation of g value with angle of entry.

\( g_w \): Total solar energy transmittance of the window. G: Kilo degree hours in the heating season based on an indoor temperature of 20°C. \( U_w \): Thermal transmission coefficient of the window.

The solar heat gain I and the number of degree hours G during the heating season are determined on the basis of the reference year DRY (before the revision in 2014). The solar heat gain through windows depends on the orientation of the windows, and therefore a single-family house with the following distribution of windows is used as a point of reference:

North: 26%
South: 41%
East/west: 33%

The calculation uses a single-light opening reference window 1.23 m x 1.48 m. The energy gain \( E_{\text{ref}} \) is an appropriate expression to use in comparisons of the efficiency of different windows during the heating season. A separate assessment may need to be made with regard to nuisance due to solar heat gain and any overheating in summer.

Even though \( E_{\text{ref}} \) is based on exploitation of solar heat gain through windows in a single-family house, \( E_{\text{ref}} \) is also used to compare windows for replacement in buildings other than dwellings. This does not apply to holiday homes as, according to the provisions of the Planning Act, they are only used for a short time during the heating season.

New windows can lead to problems with overtemperature on sunny days, so an assessment should be made in many cases of the potential need for solar screening.

Rooflights
For rooflights, the window manufacturer calculates the energy gain as:

\[ E_{\text{ref}} = I x g_w - G x U_w = 345 x g_w - 90.36 x U_w \]

where:
I: Sunlight corrected for the variation of g value with angle of entry.

\( g_w \): Total solar energy transmittance of the window with a roof slope of 45°. Kilo degree hours in the heating season based on an indoor temperature of 20°C. \( U_w \): Thermal transmission coefficient of the window.

The calculation uses an opening reference window 1.23 m x 1.48 m. The calculation of \( E_{\text{ref}} \) applies to the reference house with 45° roof slope and orientation as for facade windows. Due to the roof slope, the solar heat gain in both the heating season and in summer may be significant, so the need for screening should also be considered.

\( E_{\text{ref}} \) is also used as an argument for replacing rooflights in buildings other than dwellings. \( E_{\text{ref}} \) is not, however, used for holiday homes, as, according to the provisions of the Planning Act, they are only used for a short time in the heating season.

Glazed external walls and glazed roofs
For facades, see EN 13830 Curtain Walling, and glazed roofs, the window manufacturer calculates the energy as for windows. However, \( E_{\text{ref}} \) is calculated from the profile system centre lines of a fixed light in the size of 1.230 x 1.480 m. Opening lights must comply with the requirements for facade windows or rooflights.

DS/EN ISO 12631 is used to calculate the U value.
For glazed roofs, the manufacturer calculates the energy gain as for rooflights. However, $E_{ref}$ is calculated from the profile system centre lines in a fixed and in an opening light (if this exists) in the size of 1.230 x 1.480 m. Large glass facade panels may cause problems with excessively high temperatures on sunny days. Therefore, an assessment should in many cases be made of any need for solar screening.

### 3. Calculation of energy demands of buildings

#### Power supply to the property

The energy performance framework covers energy supplied to the property for heating, ventilation, hot water, cooling and any lighting.

No account is therefore taken of distribution losses in district heating pipes, conversion losses in or efficiency of CHP (combined heat and power) plants etc., over which the individual building owner has no influence.

For a building with a shared block plant or central heating boiler from which heat is internally distributed, any losses in the heating boiler and distribution losses from heating pipes are included in the calculations.

However, for all buildings, the maximum electricity production to be factored in from renewable energy systems such as solar cells and wind turbines corresponds to a reduction of the need for supplied energy of 25 kWh/m² per year in the energy performance framework.

#### District cooling

District cooling is often comprised by various cooling processes. This may be cooling by seawater or groundwater cooling supplemented by a conventional cooling system to cover the cooling needs during periods when the temperature level in seawater is too high. Cooling by seawater or groundwater cooling may be replaced or supplemented by cooling from a district heating system where surplus heat from waste incineration or industry is used to produce cooling water via an absorption cooling system. This cooling process is not particularly energy efficient, but makes sense during periods when the alternative is to reduce surplus heat by cooling.

To verify observance of the energy performance framework, cooling efficiency is calculated as a weighted average of the different cooling processes during the various operating periods. For free cooling using seawater and groundwater cooling, electricity consumption for pumps and auxiliary equipment is included in the calculation. For absorption cooling systems based on surplus heat, the system's energy efficiency can be replaced by the cooling efficiency COP of 4.0 for a good, conventional cooling system. This provides incentives to use cooling based on surplus heat, while also opting for a robust solution that is durable once the possibility of surplus heat production no longer exists.

#### Shared RE units

Where new builds are established with shared RE units, this must be factored into the energy performance framework provided that the owners of the buildings contribute financially to the establishment. The RE unit must further be established in the building or in the vicinity. The calculation must take account of all losses. For example, a solar heating system may have heat losses from the accumulator tank, pipe losses up to the individual building, and power consumption for the pumps and automation. In respect of solar heating systems, the possibility of factoring in applies to systems established as part of new builds outside a district heating area. However, this restriction does not apply to e.g. solar cell arrays or wind turbines.

#### Individual RE units

RE units in or connected to the building are factored into the energy performance framework for the building concerned.

#### Combined types of energy

Most buildings are provided with at least two different types of energy supply. Different factors are used for combining these types of energy supply. A factor of 2.5 for electricity combined with heat is used for buildings erected in accordance with the minimum requirements of BR15. A factor of 0.8 is used for district heating. A factor of 1.0 and the relevant fuel use efficiency are used for other heating forms.

An electricity factor of 1.8 and a district heating factor of 0.6 are used for buildings erected according to Building Class 2020. A factor of 1.0 and the relevant fuel use efficiency are used for other heating forms.

For connection of a new building to an existing boiler, which also supplies existing buildings, a factor of 1.0 is used. This also applies to utilisation of waste heat from production plants or similar.

For buildings which comply with the renovation classes, a factor of 2.5 is used for electricity. A factor of 1.0 is used for district heating. A factor of 1.0 and the relevant fuel use efficiency are used for other heating forms.

#### Room temperature
All heated rooms/spaces in dwellings, offices, schools, institutions etc. are assumed to be kept at a monthly average temperature of no less than 20°C in all months of the year. Rooms/spaces heated to between 5 and 15°C can either be regarded as unheated or heated to no less than 20°C. Spaces regarded as unheated are not included in the heated floor area.

In the case of buildings used for industrial purposes, for example, and which are heated to between 5°C and 15°C, the energy demand must be calculated at a monthly average temperature of 15°C.

In rooms with mechanical cooling, a maximum room temperature not exceeding 25°C is assumed.

In rooms whose temperature periodically exceeds 26°C, it is assumed that (in terms of keeping the room temperature at a maximum of 26°C) the surplus heat is removed by electrically powered mechanical cooling. This also applies to rooms without mechanical cooling.

It can be advantageous to try to lower excessively high temperatures by such means as mobile external solar screening and possibly by increased venting. In many buildings, this can be done by means of special ventilation windows automatically controlled by the room temperature.

**Design assumptions**

The energy demand of buildings is calculated using the methodology stipulated in SBI Guidance Note 214, *Bygningers energibehov* [Energy demands of buildings]. Unless other design assumptions can be justified for the project concerned, the assumptions stated in SBI Guidelines 213 are used.

**Mixed-use buildings**

In mixed-use buildings, for example where the same building accommodates both dwellings and shops, the total heated floor area of the building is subdivided into building sections used for the same purposes. When establishing the energy performance framework of the building, the same division into building sections with different usages is used.

For mixed-use buildings in which the main usage is at least 80% of the total floor area, the usage as a whole is taken to be that main use. For example, a block of flats in which shops occupy 15% of the floor area is deemed to be a residential property.

**Extensions**

If the energy performance framework is used for extensions, the energy performance framework applies to the extension alone. The existing building need not comply with the energy performance framework. The energy performance framework for the extension is calculated on the basis of the area of the entire building. If an extension of 20 m² is added to a 130 m² house, the energy performance framework will be 37.7 Kwh/m². If, on the other hand, the energy performance framework had been calculated on the basis of the extension, it would have been 80 Kwh/m², which would have been a significant relaxation compared with the alternative requirements in the form of U values.

Regardless of whether there are plumbing systems in the extension or not, the standard assumptions with regard to domestic water consumption must be used for the extension. Should a new heat supply not be provided for the extension, the minimum requirements of the Building Regulations for the heating system can be applied. If there is natural ventilation in the extension, it must be included in the calculation. If the extension is fitted with balanced mechanical ventilation, it must be included in the calculations.

**Tall buildings**

For buildings with high-ceilinged rooms, i.e. buildings with a room height of more than 4.0 m, the energy performance framework can be increased by a supplement. The supplement is allowed, for example, for industrial buildings and sports halls, provided the area of the building envelope divided by the floor area exceeds 3.0 m. The supplement is calculated as the difference between the energy demand for the building with a notional ceiling height of 2.8 m that complies with the energy performance framework, and the energy demand of the building with the actual ceiling height.

If a tall building has windows and doors etc. comprising more than 22% of the room floor area, the area of the windows and doors is scaled down in the ratio of 2.8 m/actual height.

**Basement areas**

For heated or partially heated basements that are not included in the floor area, a percentage of the basement area is factored into the energy performance framework. The percentage depends on whether the basement is heated to between 5°C and 15°C or whether it is heated to at least 15°C. The area allowance is unchanged, regardless of whether the building is erected in accordance with BR 15 or as Building Class 2020. There is no area allowance for unheated basements.

<table>
<thead>
<tr>
<th>Heating</th>
<th>None</th>
<th>5 &lt; temp. ≤ 15°C</th>
<th>15°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area allowance in %</td>
<td>0</td>
<td>35</td>
<td>50</td>
</tr>
</tbody>
</table>

The energy demand in the basement is calculated in the same way as in the building. However, heat loss from the basement is
only taken into account at a basement room temperature of 15 °C if the basement has been heated to between 5 °C and 15 °C. For unheated basements, only heat loss from the basement is taken into account. The building elements in the basement must be insulated, corresponding to the chosen room temperature.

**Presentation of input data and results**

The design assumptions and input data used for calculating the energy performance framework must be clearly stated in the calculations.

**Specification of input data**

Calculated input data and relevant input data stated by manufacturers are listed here.

For a number of construction products, the information can be found alongside the CE marking of the construction product.

For windows, however, the issue is more complex. The information used in the calculations is the U value of the actual window. It is therefore not enough only to obtain information on a standard dimension window in accordance with the European standard for windows (the standard includes 1230 mm × 1480 mm windows). Information is also needed on the solar heat transmittance through the window and possibly the daylight transmittance.

For skylight domes, information on the correct U value may be based on calculations in accordance with DS 418. See also DS/EN 1873.

**Specification of results**

In addition to the necessary energy supply to the building per m² heated floor area, the results of the calculation must include sufficient information in support of the result. In addition to the demand for supplied energy included in the energy performance framework, the results must show a specification of the calculated power consumption, heat usage and consumption of domestic hot water, including losses from the systems.

In addition, the assumed U-values and linear losses must be stated such that compliance with 7.6 of the Building Regulations can be demonstrated, and the calculated transmission loss through the building envelope, excluding doors and windows, must be stated in the results.

4. **Temporary portable cabins**

Temporary, portable cabins are cabins erected in connection with, for example, renovation of a school, children's institution or an office building or to meet an acute demand for space, including rehousing. Temporary here means 0-5 years. Permanent cabins or cabins used for more than 5 years must comply with the current requirements for new buildings.

Temporary, portable cabins must comply with the provisions of the Building Regulations. The provisions of Table 3 apply to insulation of the building envelope.

Until 2020, it is allowed to use direct electric heating in temporary, portable cabins for up to two years. If erected for between two and five years, direct electric heating will have to be replaced by another heat supply, or the power consumption must be compensated for by provision of a corresponding sustainable energy source. After 2020, it is expected that direct electric heating may only be used in connection with the establishment of production of renewable energy, regardless of the length of the erection period.

Newly built cabin modules must be prepared for heating other than direct electric heating. This may be, for example, by preparation for water-borne heating.

It is a precondition of the use of the U values and linear losses in Table 3 that the total area of windows and doors does not exceed 22% of the heated floor area.

U values and linear losses can be altered and window areas etc. increased, provided that heat loss from the portable cabin is not greater than if the requirements of Table 3 were satisfied.
Table 3. U values and linear losses for temporary portable cabins

<table>
<thead>
<tr>
<th>Table of U values for cabins</th>
<th>W/m²K</th>
</tr>
</thead>
<tbody>
<tr>
<td>External walls</td>
<td>0.20</td>
</tr>
<tr>
<td>Partition walls adjoinning rooms that are unheated or heated to a temperature which is more than 5°C below the temperature in the room concerned.</td>
<td>0.40</td>
</tr>
<tr>
<td>Ground slabs and suspended upper floors above open air or a ventilated crawl space.</td>
<td>0.12</td>
</tr>
<tr>
<td>Ceiling and roof structures, including jamb walls, flat roofs and sloping walls directly adjoining the roof.</td>
<td>0.15</td>
</tr>
<tr>
<td>Windows, including glass walls, external doors and hatches to the outside or to rooms/spaces that are unheated or heated to a temperature which is more than 5°C below the temperature in the room/spaces concerned (does not apply to ventilation openings below 500 cm²).</td>
<td>1.50</td>
</tr>
<tr>
<td>Rooflights and skylight domes.</td>
<td>1.80</td>
</tr>
</tbody>
</table>

Linear loss W/mK

| Foundations | 0.20 |
| Joint between external wall, windows or external doors and hatches. | 0.03 |
| Joint between roof structure and rooflights or skylight domes. | 0.10 |

Retro-fitting of insulation is required when roof cladding is replaced. The overview shows the areas in which it is cost-effective to retro-fit insulation. If a building element or component is replaced, the requirements of the Building Regulations for building elements or components must be met.

5. Determination of the specific energy consumption for lifts

The provisions on lifts in 8.8 are based on the German standard, VDI 4707 Aufzüge Energieeffizienz, März 2009. It is not a condition that a manufacturer has the energy consumption of lifts certified by a third party, but if the manufacturer has had a lift certified and it complies with the provisions of 8.8(5), there will normally be no need for documentation of measured electricity consumption.

It appears from 8.8 of the Building Regulations that energy consumption during standby and operation must be measured in a way to ensure that the total specific electricity consumption can be calculated. Measurements will therefore be made for lifts that have no labelling or where consumption is higher than expected. The potential recovered energy must also be included in energy consumption measurements to ensure that the energy consumption is adjusted correspondingly.

ISO standards 25745-1 and 25745-2 Energy performance of lifts, escalators and moving walks are being prepared. In future, the energy provisions are expected to refer to these standards after they have been adopted.

Hours of use

The applied German standard divides lifts into five usage categories, based on daily hours of use.

Table 4. Usage categories by average daily hours of use, determined as average number of trips and average duration of a trip (Excerpt)

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>low</td>
<td>rare</td>
<td>occasional</td>
<td>frequent</td>
<td>very frequent</td>
</tr>
<tr>
<td>Hours of use</td>
<td>0.2</td>
<td>0.5</td>
<td>1.5</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Area</td>
<td>0&lt; t&lt;0.3</td>
<td>0.3&lt; t&lt;1</td>
<td>1&lt; t&lt;2</td>
<td>2&lt; t&lt;4.5</td>
<td>4.5&lt; t</td>
</tr>
<tr>
<td>Standby time (hours)</td>
<td>23.8</td>
<td>23.5</td>
<td>22.5</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Typical buildings</td>
<td>Up to 6 dwellings</td>
<td>Up to 20 dwellings.</td>
<td>Up to 50 dwellings.</td>
<td>More than 50 dwellings.</td>
<td>Offices over 100 m tall. Large hospitals.</td>
</tr>
<tr>
<td>Small offices or administrative buildings with limited traffic</td>
<td>Small offices with 2 to 5 storeys.</td>
<td>Small offices with up to 10 storeys.</td>
<td>Large offices, more than 10 storeys. Large hotels. Small and medium-sized hospitals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small hotels.</td>
<td>Medium-sized hotels.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goods lifts with limited traffic</td>
<td>Goods lifts with medium traffic</td>
<td>Goods lifts included in a production process with daytime production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goods lifts included in a production process with 24/7 production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As it appears from Table 4, usage categories 4 and 5 will be rarely used in Denmark.

Energy demand during operation

The standard is determined by a reference trip comprising the following complete cycle:
1) The door is open
2) The door closes
3) Going up (or down) at full lifting height
4) Opening and closing of lift door
5) Going down (or up) at full lifting height
6) Opening of door
7) End of trip

<table>
<thead>
<tr>
<th>Load as percentage of rated load</th>
<th>Travel factor in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>75</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5. Load range

The reference trips can be made with empty lift cars for lifts with a counterweight equal to the weight of the lift car and an additional weight equal to 40-50% of its rated load and for lifts with a counterweight of less than 30%.

To adjust the values of the load range in Table 5 to measurements with empty lift cars, the values are multiplied by the following load factors:

0.7 for lifts with a counterweight (weight of the car and 40-50% of the rated load) and
1.2 for lifts without a counterweight or with a counterweight that is less than 30% of the weight of the car.

The corrective factors are not used when energy demand is determined by the reference load in Table 5.

The potential recovered energy must also be included in energy consumption measurements to ensure that the energy consumption is adjusted correspondingly. Energy demand is determined by the reference trip in Wh by adding together the individual energy consumptions. This is divided by the rated load and the length of the trip. To ensure representativeness, the reference trip is made several times.

Energy consumption can depend on temperature conditions. Testing should therefore be performed under average temperature conditions.

Measurement of energy consumption

Measurements are performed as specified in 4.3 and 4.4 of VDI 4707.

Energy demand in standby mode

Standby energy demand is calculated as $E_{\text{Standby}} = P_{\text{Standby}} \times t_{\text{Standby}}$

Table 6. Standby energy class is listed as power P

<table>
<thead>
<tr>
<th>Power (W)</th>
<th>&lt; 50</th>
<th>&lt; 100</th>
<th>&lt; 200</th>
<th>&lt; 400</th>
<th>&lt; 800</th>
<th>&lt; 1600</th>
<th>&gt; 1600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
</tbody>
</table>

$E_{\text{Standby}}$ is energy demand during standby in Wh.

$P_{\text{Standby}}$ is standby power demand in W.

$t_{\text{Standby}}$ is standby duration in hours h.

Energy demand during operation:

Table 7. Specific energy consumption during operation, by energy class

<table>
<thead>
<tr>
<th>Specific energy consumption (mWh/(kg m))</th>
<th>&lt; 0.56</th>
<th>&lt; 0.84</th>
<th>&lt; 1.26</th>
<th>&lt; 1.89</th>
<th>&lt; 2.80</th>
<th>&lt; 4.20</th>
<th>&gt; 4.20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
</tr>
</tbody>
</table>

Specific energy consumption during operation is expressed in mWh/(kg m).

Overall labelling

Total specific energy consumption of lifts in each usage category calculated as:

$$E_{\text{spec}} = E_{\text{spec, operation max}} + (P_{\text{Standby}} \times t_{\text{Standby}} \times 1000)/(Q \times v \times t_{\text{operation}})$$

Where:

$E_{\text{spec}}$ is the specific energy consumption during operation in mWh/(kg m),

$Q$ is the rated load in kg,

$v$ is the nominal velocity in m/s
t is the operating hours.

Example of overall labelling.
For example, the limit for the entire energy class A in usage category 1:

\[ E < 0.56 + \frac{(50 \times 23.8 \times 1000)}{(Q \times v \times 0.2 \times 3600)} = 0.56 + T_1. \]

\[ T_1 = \frac{(50 \times 23.8 \times 1000)}{(Q \times v \times 0.2 \times 3600)}. \]

\[ T_2 = \frac{(50 \times 23.5 \times 1000)}{(Q \times v \times 0.5 \times 3600)}. \]

\[ T_3 = \frac{(50 \times 22.5 \times 1000)}{(Q \times v \times 1.5 \times 3600)}. \]

\[ T_4 = \frac{(50 \times 21 \times 1000)}{(Q \times v \times 3 \times 3600)}. \]

\[ T_4 = \frac{(50 \times 18 \times 1000)}{(Q \times v \times 6 \times 3600)}. \]

The labelling is thus based on the overall labelling for standby mode and during operation by calculating the limits shown below:

**Table 8. Overall energy labelling based on VDI 4707**

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.56 + T1</td>
<td>0.56 + T2</td>
<td>0.56 + T3</td>
<td>0.56 + T4</td>
<td>0.56 + T5</td>
</tr>
<tr>
<td>B</td>
<td>0.84 + 2T1</td>
<td>0.84 + 2T2</td>
<td>0.84 + 2T3</td>
<td>0.84 + 2T4</td>
<td>0.84 + 2T5</td>
</tr>
<tr>
<td>C</td>
<td>1.26 + 4T1</td>
<td>1.26 + 4T2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1.89 + 8T1</td>
<td>1.89 + 8T3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>2.80 + 16T1</td>
<td></td>
<td></td>
<td>2.80 + 16T4</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>4.20 + 32T1</td>
<td></td>
<td></td>
<td></td>
<td>4.20 + 32T5</td>
</tr>
<tr>
<td>G</td>
<td>4.20 + 32T1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In connection with installation of lifts in existing buildings, new lifts must comply with energy class B.

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**Appendix 7**

**Description of control system for the water and drainage systems which are not covered by a harmonised standard or a European Technical Approval (ETA)**

The requirement for a national approval of factory-made products in contact with drinking water only applies to products which affect the health quality of the drinking water.

The following requirements apply to other products used in water and drainage systems and which have not yet been covered by a technical specification under the Construction Products Regulation, as well as to the mechanical/physical properties of factory-made products in contact with drinking water:

- An initial type-testing based on the properties which, according to the Building Regulations, are relevant to declare in Denmark.

- A production control system which ensures that the declared performance of the products is maintained. The production control is not required to be certified.

**Factory production control**

The manufacturer is required to have its own production control system. This is an ongoing internal control performed by the manufacturer. This control must systematically document that the products maintain the declared properties.

The factory production control combines production technology with the means necessary to maintain and check compliance of the product with the relevant technical specifications.

Production control covers both checking and testing of measuring equipment, raw materials, components used, processes, machines, production equipment and the finished products, including their material properties. Finally, the control covers the use to which the results obtained are put.

**Requirements for production control**
The manufacturer is responsible for organising the factory production control system. Duties and responsibilities under the system must be documented, and this documentation must be kept up to date. The manufacturer may delegate the competence to a person who has the necessary authority to:

- organise the procedures that can verify compliance of the product at relevant stages of the process;
- identify and record all cases of non-conformity;
- find methods of rectifying cases of non-conformity.

The manufacturer should describe the control system in detail and keep this documentation up to date. The manufacturer's documentation and the factory control system must be tailored to the product and the manufacturing process.

The reliability of the control systems should be established in relation to the compliance of the product, i.e.:

- planning of procedures and instructions;
- effective implementation of procedures and instructions;
- a specification of duties, responsibilities and results;
- the results must be used to correct discrepancies, make good the effects of discrepancies and revise the production control system to remove the cause of non-conformity with the technical specification if this proves to be necessary.

Checking covers one or more of the following measures:

- specification and control of the raw materials and parts used;
- checking and testing during production, within a pre-determined framework (checking and testing cover both production of the product and adjustment of production machinery and equipment etc. Checks, tests and their frequency depend on the type and composition of the product, complexity of the production processes, sensitivity of the properties of the product to variations in production parameters etc.);
- checking and testing of the finished products to the extent which may be defined in the technical specifications, and which are adjusted to the product and the conditions under which it is produced.

If the finished products are not checked once they are on the market, the manufacturer must ensure that packaging, handling and transport are arranged in such a way that the product is not damaged.

The manufacturer is responsible for ensuring that the necessary calibration of measuring and testing equipment is carried out.

Verification

The manufacturer must be in possession of or have access to the measuring equipment and staff needed for carrying out the requisite verifications and testing. The manufacturer can comply with this requirement by making an agreement with one or more companies or individuals who have the necessary knowledge and equipment.

The manufacturer must calibrate or verify and maintain checking, measuring and testing equipment in good, serviceable condition so as to be ready to verify compliance of the product with the specified quality.

Monitoring of compliance

For certain products, it may be appropriate for compliance to be monitored both at the initial stages of production and at the most important stages of the production phase. This means that only products which have passed the initial checks and tests are allowed further in the production process.

Testing

Testing must be carried out in accordance with a defined programme, using the methods set out in the technical specification.

Testing methods must generally be direct methods.

The manufacturer must set up and maintain records which show that tests on the product have been carried out. These records must show that the product complies with the defined acceptance criteria.
Ensuring compliance

If check or test results show that the product does not meet the requirements, the manufacturer must immediately take the necessary measures to bring production back into compliance.

This may be the case if, for example, the statistical variation of test results exceeds limits defined.

Products and series of products which do not comply with the specified quality must be kept separate, so that they can be identified. When the defect has been corrected, testing and verification may be repeated.

If the product has been delivered before the results are known, the manufacturer must have a procedure in place for ensuring that the customers are informed in such a way that the necessary steps can be taken.

The manufacturer's records

The factory's own production control must be well documented by the manufacturer. A description of the product, date of manufacture, testing methods used, test results and acceptance criteria must be recorded, with the signature of the person who was responsible for the verification.

The manufacturer must also record any steps taken to bring the product into compliance with the specified requirements. This could, for example, be further testing, changes to the production process, rejection or repair of the product.

Traceability

The manufacturer is responsible for maintaining a comprehensive schedule of individual products or series of products with details of production and properties. The manufacturer must also record to whom the products were first sold.

This information must enable conclusive identification and tracing of individual products or series of products. In certain cases, for example when dealing with raw materials, this is not always possible.

The manufacturer must store the technical documentation for ten years after the product has been put on the market.

Official notes