

Buildings and structures for agriculture —

Part 20: Code of practice for general design considerations

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Committees responsible for this British Standard

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- AFRC Institute of Engineering Research
- Aggregate Concrete Block Association
- Brick Development Association
- British Cement Association
- British Commercial Glasshouse Manufacturers' Association
- British Constructional Steelwork Association Ltd.
- British Poultry Federation Limited
- British Precast Concrete Federation Ltd.
- British Veterinary Association
- British Wood Preserving Association
- British Woodworking Federation
- Cold Rolled Sections Association
- Department of Agriculture and Fisheries for Scotland
- Department of Agriculture Northern Ireland
- Electricity Supply Industry in England and Wales
- Farm and Rural Buildings Centre
- Farm Buildings Association
- Fibre Cement Manufacturers' Association Limited
- Health and Safety Executive
- Institution of Civil Engineers
- Local Authority Organizations
- Ministry of Agriculture, Fisheries and Food
- National Farmers' Union
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors
- Steel Construction Institute
- Timber Research and Development Association

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Foreword

This Part of BS 5502 has been prepared under the direction of the Farm and Horticultural Buildings Standards Policy Committee and comprises a revision of BS 5502-1.4, BS 5502-1.6, BS 5502-2.1, BS 5502-3.8 and BS 5502-3.11 which are withdrawn. It also supersedes BS 4903 which is withdrawn.

While BS 5502 is being revised and added to, the opportunity is being taken to restructure it into the following broad subject areas:

- *Part 0: Introduction and consolidated index;*
- *Parts 10 to 19: Reference information and legislation;*
- *Parts 20 to 39: General design;*
- *Parts 40 to 59: Livestock buildings;*
- *Parts 60 to 79: Crop buildings;*
- *Parts 80 to 99: Ancillary buildings.*

More specifically, the general design series will comprise:

- *Part 20: Code of practice for general design considerations;*
- *Part 21: Code of practice for selection and use of construction materials;*
- *Part 22: Code of practice for design, construction and loading;*
- *Part 23: Code of practice for fire precautions;*
- *Part 24: Code of practice for energy management;*
- *Part 25: Code of practice for services and facilities;*
- *Part 30: Code of practice for control of infestation;*
- *Part 31: Guide to waste management;*
- *Part 32: Guide to noise attenuation;*
- *Part 33: Guide to control of odour pollution;*
- *Part 34: Guide to control of dust;*
- *Part 35: Guide to control of gases and vapours.*

A more detailed description of the new structure of BS 5502 is given in Part 0.

The object of introducing the new structure is to allow subject areas to be broadly characterized, and related subject matter, whether in the form of recommendations, guidance or supporting data, to be rationalized and brought together. It will also allow sufficient flexibility to enable the standard to be expanded and developed in a logical way in the future. Parts 20 to 39 relating to general design will follow broadly the existing structure of BS 5502-1.0 to BS 5502-1.7.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people, for whose guidance it has been prepared.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, page i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 5502 gives recommendations on the general design considerations in relation to agricultural buildings and structures.

This Part of BS 5502 does not cover construction materials, structural design and loading, fire protection, energy management or services which are included in BS 5502-21 to BS 5502-25¹⁾ respectively.

NOTE The titles of the publications referred to in this standard are listed on the page 16.

2 Definitions

For the purposes of this standard, the definitions given in BS 6100-1.5.1 apply, together with the following.

NOTE Work has commenced on a further Part of BS 5502 (Part 10) which will be a glossary of terms for buildings and structures of agriculture.

2.1

farm buildings

- 1) The farmstead comprising the main working buildings, yards and roadways adjacent there to.
- 2) Outlying buildings for special purposes.

2.2

market garden

a holding on which flowers, fruit and vegetables are grown to maturity for the market

2.3

nursery

a holding on which plants are raised

3 Design objective and classification

3.1 Objective

The function of the farm building should be established and its design should draw together both functional and aesthetic requirements within the constraints of statutory legislation.

3.2 Adaptability

Consideration should be given to possible future extension of and improvements to the building, and to its change of use. The proximity to roads and supply of services should be established.

3.3 Classification

Every farm building and structure should be designed in accordance with one of the four classes as described in BS 5502-22. The classifications take account of various factors and reference should be made to clause 12 of BS 5502-22:1987.

Care should be taken when siting buildings and structures to ensure that the classification of existing buildings and structures is not infringed.

3.4 Durability

3.4.1 Durability life

Durability life may be different from design life. Where required, guidance should be sought on durability life of materials.

NOTE This information may normally be obtained from the manufacturer or supplier.

Unless otherwise stated, the structural components and external envelope should, with reasonable maintenance, remain efficient for the design life.

3.4.2 Materials

Special aspects of use which may affect durability of materials (see BS 5502-21), e.g. animal body pressure, kicking, chewing, routine hygiene, damage by farm vehicles, presence of aggressive atmospheres and/or of corrosive chemicals, fertilizers and effluent, should be considered.

4 Statutory requirements

4.1 Legislation

Regulations and planning requirements controlling the siting, design and construction of farm buildings and allied works are contained in various Acts of Parliament as well as in building regulations. Most of these Acts and regulations and their main provisions are summarized in BS 5502-11¹⁾.

4.2 Planning amenities and nature conservancy

In addition to the requirements of statutory legislation (see 4.1), the following points should be considered at the design stage:

- a) compliance with any local or non-statutory planning requirements;
- b) the safeguarding of amenities, general aesthetic values, and quality of landscape;
- c) consultation with the national park authority or the local office of the Nature Conservancy Council if the site is in a national park or includes a site of special scientific interest.

¹⁾ In preparation.

4.3 Animal welfare

Attention is drawn to the provisions of the current Code of Recommendations for the Welfare of Livestock²⁾. Reference should also be made to the appropriate Parts of this standard in the livestock buildings series³⁾.

4.4 Pollution

Pollution from noise, effluent, smoke, smell, chemicals and any specialized buildings and processes and its effect on and proximity to housing, airfields, motorways, factories, waterways, catchment areas, reservoirs and the sea should be considered (see BS 5502-25 and BS 5502-30⁴⁾).

Recommendations on the control of pollution and infestation (see BS 5502-30 to BS 5502-35⁴⁾) should be followed.

4.5 Historic buildings

It should be established whether existing buildings are scheduled as of historic or architectural interest and whether the building is listed.

4.6 Archaeological remains

It should be established whether known archaeological remains, e.g. barrows (burial remains), are to be disturbed (see BS 5502-11).

4.7 Highways, bridle paths and footways

At the design stage consideration should be given to any local authority restrictions on the use of highways and to the requirements of other bodies, e.g. national parks, the Milk Marketing Board and the Ministry of Agriculture, Fisheries and Food, and in particular to the provision of bridle paths, footpaths and the segregation of animal loading areas.

4.8 Fire precautions

Local authority and insurance requirements may necessitate:

- a) some limitations on the usage of materials;
- b) means of escape for humans and animals;
- c) provision of access for fire-fighting appliances and an emergency static water supply;
- d) siting in proximity to buildings used for human habitation;

and reference should be made to BS 5502-23.

5 Siting and surroundings

5.1 Site

5.1.1 Survey

In addition to any structural survey, a survey should be carried out to establish the boundaries of the site and the position of existing buildings, trees and other vegetation, services, gradients, water courses and ditches, and overhead restrictions.

5.1.2 Investigation

A site investigation should be carried out:

- a) to determine the allowable safe bearing pressure on the ground;
- b) to establish the groundwater level, taking account of seasonal variation;
- c) to establish the presence of any harmful chemicals in the soil or ground water.

Detailed recommendations on site investigation are given in BS 5930.

5.2 Exposure

5.2.1 General

The effect of both climatic and atmospheric corrosion should be considered.

5.2.2 Climatic exposure

The relevant climatic exposure category should be established by reference to the relevant British Standard design code of practice according to the material used.

Site topography and height of building should be considered when the exposure category is established.

NOTE When buildings are on hill tops, the exposure category may be upgraded, whereas low rise buildings can benefit from shelter by trees, walls or other buildings and the category may be downrated.

5.2.3 Atmospheric corrosion

The consequences of atmospheric corrosion should be considered in and around areas of industrial development and marine areas (see Zinc corrosivity mapping, MAFF⁵⁾).

5.2.4 Internal atmosphere

Due to the function of some farm buildings the internal atmosphere may be detrimental to the materials used and the effect on the overall exposure rating should be considered.

²⁾ Published by the Ministry of Agriculture, Fisheries and Food (MAFF), the Department of Agriculture and Fisheries for Scotland and the Department of Agriculture for Northern Ireland.

³⁾ BS 5502-40, BS 5502-41, BS 5502-42, BS 5502-43, BS 5502-49, BS 5502-51, and BS 5502-52 are in preparation.

⁴⁾ In preparation.

⁵⁾ Published by HMSO.

5.3 Surroundings

5.3.1 *Interrelationship*

Consideration should be given to the disposition of and space around and between buildings and other obstacles to wind flow (e.g. trees) and to the resulting effects on the environmental conditions in and around the buildings.

Care should also be taken to ensure that the airflow from ventilation inlets or outlets should not become obstructed, or be influenced unduly by adjacent buildings and structures.

5.3.2 *Isolation*

The importance of isolating buildings, for visual, aural and for disease control and safety reasons, should be established for the various usages.

5.3.3 *Services*

Consideration should be given to the proximity of roads, water, electricity and gas supply pipelines and to any need to provide standby services in the event of failure of the main supply. The disposal of rainwater and, where appropriate, the safe disposal of waste materials should be established.

5.4 Access and egress

For appropriate turning circles for vehicular traffic, reference should be made to the Part of BS 5502 for the building type. Clearance heights for vehicles are given in BS 5502-80.

The probable flow, volume and type of traffic in and around the farmstead should be established, in order to ensure that all movements are as simple and direct as possible, particularly having regard to the handling of material and the probable weights involved.

6 Visual aspects

6.1 Landscape

6.1.1 *General*

Farm buildings are a significant component of most agricultural landscapes. Traditionally in their siting and appearance they reflected the farming system, local materials (often underlying geology), local building techniques, and the particular character of the site in the landscape.

Modern farm buildings should express these influences in their appearance, otherwise the traditional, and pleasing, close relationship of farm building to local landscape is weakened or lost. Functional and economic requirements can often lead to a large-scale standardized building, generally requiring a flat site and a large area around to allow for access and future expansion. However “functional” decisions made on the position of the building, its shape, materials and the layout of the spaces around the building all help determine the final appearance of the building in its setting. Throughout the planning and design of a new building every effort should therefore be made to achieve a functionally sound building and one which contributes successfully to the landscape.

The aim should be to acknowledge and reflect, where possible, the existing local landscape and building character whilst creating a contemporary structure appropriate to its function and building technology.

6.1.2 *Siting within the broad landscape*

The landform (contours), vegetation patterns and water bodies (trees, hedges, ponds, etc.) and man-made artefacts (walls, fences, etc.) in combination create the landscape setting for a new building. The choice of site should respect these elements in order to:

- a) reduce disturbance to the fabric of the landscape generally, bearing in mind the effects from visual viewpoints; and
- b) enhance the final relationship between building and site.

6.1.3 *Siting in relation to existing buildings*

Farmsteads of traditional or mixed character can generally, with care, accommodate modern farm buildings. When choosing the site and orientation of a new building, the effect of its scale and shape on the existing buildings should be considered. The introduction of a new building changes the appearance of the whole group, and with care this can be used to good effect.

6.1.4 *Hard landscape*

Access roads and hardstanding areas require the same attention as the building itself in order to achieve harmony between the new development and the existing landscape and building elements. The precise layout of such areas should be carefully designed, and the materials carefully chosen from the several alternatives. Fencing and walling is useful both as physical containment and for visual linking of elements (see BS 1722).