

Buildings and structures for agriculture —

Part 40: Code of practice for design and construction of cattle buildings

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/549, Agricultural buildings and structures, upon which the following bodies were represented:

- ADAS UK Ltd
- British Commercial Glasshouse Manufacturers' Association
- British Precast Concrete Federation Ltd
- British Veterinary Association
- Cold Rolled Sections Association
- Department of the Environment, Food and Rural Affairs
- Environment Agency
- Fibre Cement Manufacturers' Association Ltd
- Galvanizers' Association
- Health and Safety Executive
- Institution of Structural Engineers
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors
- Rural Design and Building Association
- Silsoe Research Institute
- Scottish Executive — Environment and Rural Affairs Department
- Steel Construction Institute

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Foreword

This Part of BS 5502 has been prepared by Technical Committee B/549. It supersedes BS 5502-40:1990 which is withdrawn. This revision takes into account the new regulations on the welfare of farmed animals and current advances in livestock handling research.

BS 5502 has been structured 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, reference information and legislation is covered in:

- Part 11: Guide to regulations and sources of information.

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

The object of the 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 BS 5502 to be expanded and developed in a logical way in the future.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its 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, pages i and ii, pages 1 to 20, an inside back cover and a back cover.

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1 Scope

This Part of BS 5502 gives recommendations for buildings used for the housing of cattle, and more specifically for the housing of dairy cows, beef cattle, bulls, young stock and calves.

The recommendations are not applicable to milking parlours.

NOTE 1 Data on milking parlours can be obtained in BS 5502-49 and BS ISO 3918, BS ISO 5707 and BS ISO 6690.

NOTE 2 BS 5502-11 provides guidance and further information regarding legislative requirements.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5502-20, *Buildings and structures for agriculture — Part 20: Code of practice for general design considerations*.

BS 5502-21, *Buildings and structures for agriculture — Part 21: Code of practice for selection and use of construction materials*.

BS 5502-22, *Buildings and structures for agriculture — Part 22: Code of practice for design, construction and loading*.

BS 5502-23, *Buildings and structures for agriculture — Part 23: Fire precautions — Code of practice*.

BS 5502-25, *Buildings and structures for agriculture — Part 25: Code of practice for design and installation of services and facilities*.

BS 5502-51, *Buildings and structures for agriculture — Part 51: Code of practice for design and construction of slatted, perforated and mesh floors for livestock*.

BS 5502-81, *Buildings and structures for agriculture — Part 81: Code of practice for design and construction of chemical stores*.

BS 6100 (all parts), *Glossary of building and civil engineering terms*.

BS 8000 (all parts), *Workmanship on building sites*.

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS 6100 and the following apply.

3.1

calf

bovine animal up to 6 months old

3.2

young stock

bovine animals, from 6 months to 24 months for cows, and 6 months to 12 months for bulls

4 Animal welfare considerations

NOTE Attention is drawn to the provisions of the various current Codes of recommendations applying in England, Scotland, Wales and Northern Ireland for the welfare of cattle, and the various statutory regulations, including the Welfare of Farmed Animals Regulations [1, 2, 3, 4] that apply in the various countries of the UK. BS 5502-11 provides guidance and further information regarding legislative requirements.

4.1 The welfare of cattle should be assessed in the context of the guidelines known as the “Five Freedoms” as follows.

- a) Freedom from hunger and thirst — by ready access to fresh water and a diet to maintain full health and vigour.
- b) Freedom from discomfort — by providing an appropriate environment including shelter and a comfortable resting area.
- c) Freedom from pain, injury or disease — by prevention or rapid diagnosis and treatment.
- d) Freedom to express normal behaviour — by providing sufficient space, proper facilities and company of the animal’s own kind.
- e) Freedom from fear and distress — by ensuring conditions and treatment which avoid mental suffering.

4.2 All buildings should be designed, constructed and maintained so as to avoid discomfort, distress or injury to cattle. All fittings and surfaces accessible to livestock should not be harmful to livestock and should not have sharp edges or projections and fittings should be arranged so as to avoid injury. All buildings should be capable of being cleaned and disinfected.

4.3 Cows, replacement heifers or calves should not be kept on a fully slatted, perforated or mesh floor. A solid floor area incorporating straw or other suitable bedding should be provided to ensure comfort and to reduce the risk of injury to the udders and hocks of all cattle.

4.4 In accommodation for cows, it is essential to provide separate solid floored bedded pens for use at calving time, and a solid floored creep area with bedding should be available for the calves, where cows with calves at foot are grouped together. Calves should have access to a well-bedded and dry-lying area.

4.5 Cattle housed on slats with rubberized or cushioned surfaces should have access to adequate areas of hard surfacing to provide foot abrasion.

4.6 All yards, pens and passageways should be kept in good condition.

5 Design and construction

5.1 Design

The building or structure should be designed and constructed in accordance with the general principles and recommendations given in BS 5502-20, BS 5502-21, BS 5502-22, BS 5502-23 and BS 5502-25.

Pens, isolation boxes and other accommodation for the housing of fractious animals should be robust in construction and have safeguards for the protection and escape of stockpersons. Particular attention should be paid to the housing of bulls (see **10.5** and **10.6**).

5.2 Occupancy

The types and ages of the cattle to be housed, and periods during which the various parts of the building or buildings are subject to human occupation should be taken into account in the design in accordance with BS 5502-22.

5.3 General construction of buildings

All surfaces and fittings that could come into contact with cattle should be free from projections, edges or perforations that could cause damage, pain or injury to cattle.

5.4 Floors

5.4.1 General

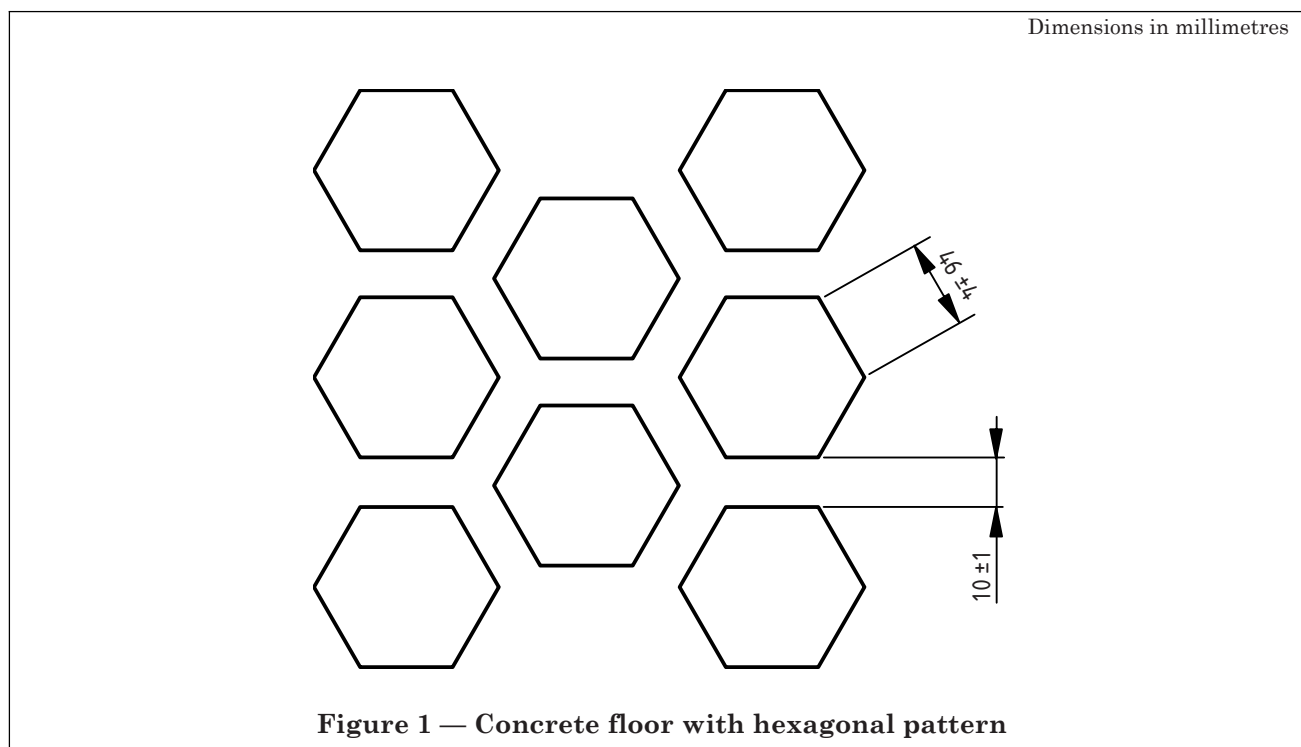
Floors, to which stock have access, should have a slip resistant surface. However, this should not be abrasive nor allow moisture to accumulate so creating a risk of ice patches.

5.4.2 New concrete floors

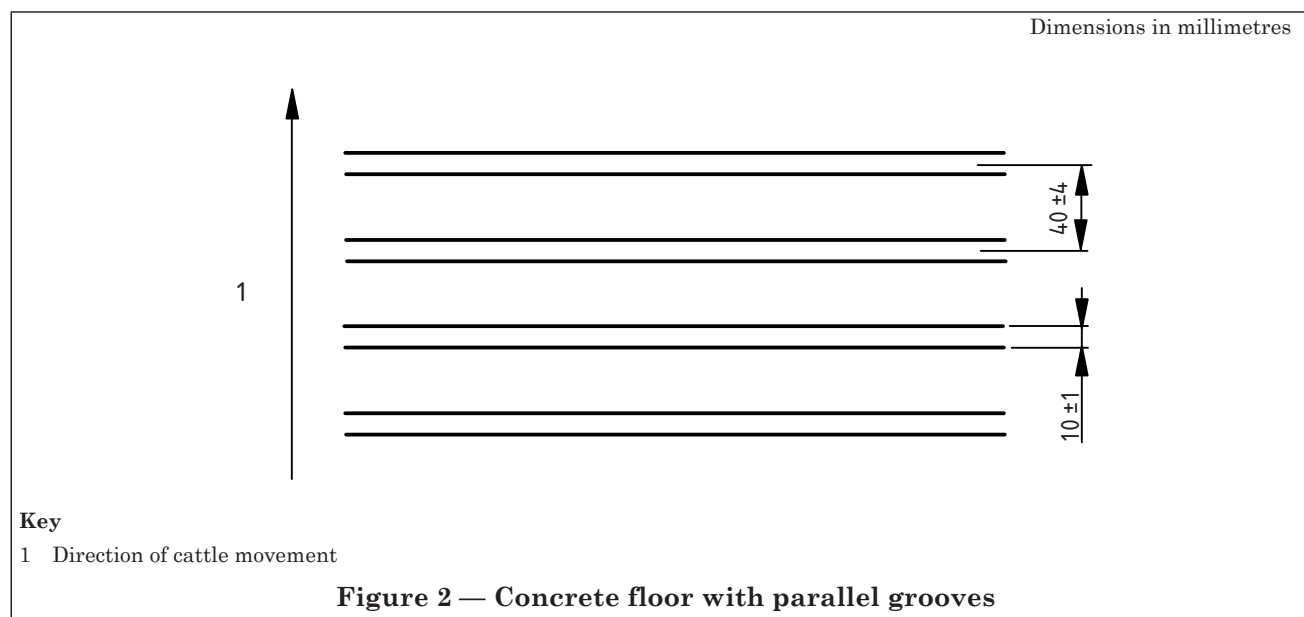
To provide slip resistance for cattle walking in all directions, and to eliminate the risk of high pressures on the hoof, new concrete floors should be designed with grooves either in a pattern of regular hexagons or in parallel lines.

NOTE A pattern of regular hexagons on flooring is supported by research carried out by CIGR as reported in *The design of dairy cow housing* [5].

The hexagonal pattern should consist of regular hexagons with (46 ± 4) mm sides separated by grooves (10 ± 1) mm wide and a minimum 6 mm deep as shown in Figure 1.



The parallel lines should be spaced (40 ± 4) mm between centres, with grooves (10 ± 1) mm wide and a minimum 6 mm deep as shown in Figure 2. Where the direction of cattle movement is known, parallel grooves should be used at right angles to the movement of the cattle.



5.4.3 Existing concrete floors

Existing concrete floors should be treated to create grooves in parallel lines or in a pattern of regular squares.

The parallel lines should be spaced (40 ± 4) mm between centres, with grooves (10 ± 1) mm wide and a minimum 6 mm deep as shown in Figure 2.

The square pattern should consist of regular diamonds or squares with (40 ± 4) mm sides separated by grooves (10 ± 1) mm wide and a minimum 6 mm deep as shown in Figure 3. The use of diamond cutters is recommended to avoid aggregate becoming exposed and risking damage to feet.

NOTE Square patterned grooves on concrete floors are less preferable as they are not as effective in preventing high pressure on the animals' hoofs.