

Buildings and structures for agriculture —

Part 31: Guide to the storage and handling of waste

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Foreword

This Part of BS 5502 has been prepared under the direction of the Technical Sector Board for Building and Civil Engineering.

BS 5502-31:1995+A1:2010 supersedes BS 5502-31:1995, which is withdrawn.

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags **A1** **A1**. Minor editorial changes are not tagged.

Amendment A1 introduces the following principal changes:

- all references have been updated;
- Clause 4 has been updated to reflect current guidance regarding pollution from agricultural waste;
- Clause 7 has been updated to reflect current guidance regarding preliminary considerations for waste storage and handling and Table 4 and Table 5 have been removed;
- Clause 8 has been updated to reflect current guidance regarding the design of organic waste storage and handling facilities and Table 6 removed; and
- Clause 10 has been replaced to reflect current waste regulations and duty of care.

BS 5502 is structured in 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 comprises:

- *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 25: Code of practice for design and installation of services and facilities;*
- *Part 30: Code or practice for control of infestation;*
- *Part 31: Guide to the storage and handling of waste;*
- *Part 32: Guide to noise attenuation;*
- *Part 33: Guide to control of odour pollution.*

A more detailed description of the structure 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 also allows 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 cannot confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 18, an inside back cover and a back cover.

1 Scope

This Part of BS 5502 gives recommendations on building and structural aspects of agricultural (including horticultural) waste storage and handling. In particular it addresses the prevention of air and water pollution that can be caused by liquid effluents such as livestock slurry, silage effluent and dirty water.

Equipment (e.g. pumps, mixers and separators) associated with waste storage, handling and treatments are outside the scope of this standard.

This standard excludes chemicals (e.g. pesticides and disinfectants), medicines, fuel oils, and domestic, commercial and industrial waste products such as building materials, metals, paper and plastics.

2 References

2.1 Normative references

This Part of BS 5502 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 20. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this Part of BS 5502 the definitions given in BS 6100 (all parts) apply, together with the following.

3.1

controlled waters

waters that are covered by the [\[A1\]](#) Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 [\[A1\]](#) [1]

NOTE These include underground waters, ponds, lakes, ditches, streams, rivers, coastal waters and land drains.

3.2

dirty water

water contaminated with manure, urine, crop effluents, milk or other dairy products, or cleaning materials

3.3

dry matter content (DMC)

the quantity of solids present in an agricultural waste, expressed as a percentage by mass

3.4

major pollution incident

a release of pollutant(s) which causes one or more of the following:

- a) a potential or actual persistent detrimental effect on water quality or aquatic life;
- b) the need for closure of potable, industrial or agricultural water abstraction;
- c) an extensive fish kill;
- d) an excessive breach of conditions of discharge consents;
- e) the need for extensive remedial action;
- f) a major effect on amenity value.

3.5

silage effluent

a liquid produced from ensiled crops

3.6

slurry

a mixture of animal excreta, urine, water and possibly a small amount of bedding, of a consistency that allows it to be pumped, or discharged under gravity

3.7

solid manure

a mixture of animal faeces and bedding, of a consistency that enables it to be stacked

3.8

suspended solids

solids in suspension in liquid effluents, measured in milligrams per millilitre

3.9

vegetable washings

a mixture of water that has been used in processing vegetables and the debris arising from this processing

3.10

yard or parlour washings

water fouled by materials from an area being washed down

NOTE 1 These materials include animal excreta, grit, soil, feed and bedding from yards and walkways, and milk and cleaning chemicals from dairies and milking parlours.

NOTE 2 Yard and parlour washings are types of dirty water (see 3.2).

3.11
biochemical oxygen demand (BOD)¹⁾

mass concentration of dissolved oxygen consumed under specified conditions by biological oxidation of matter in water

4 Pollution from agricultural waste

4.1 Water pollution

4.1.1 General

Water pollution occurs from agricultural activities through leakage and run off directly into controlled waters and indirectly by leaching and drainage through the ground.

4.1.2 Statutory responsibility

^{A1} In England and Wales, the Environment Agency, and in Scotland, the Scottish Environment Protection Agency (SEPA), have a statutory duty to maintain and improve the quality of controlled waters and to conserve and ensure the proper use of water resources. ^{A1} They are required to control water pollution by issuing discharge consents, to monitor water quality and the achievement of national standards and to take enforcement action where necessary.

^{A1} Text deleted ^{A1}

4.1.3 Nature and extent of water pollution

^{A1} Considerable quantities of livestock (8×10^7) t and silage effluent (1.5×10^6) t are recycled on agricultural land in the UK each year. ^{A1} Numerous other liquid wastes, in much smaller quantities are produced from a variety of agricultural and horticultural sources.

While these materials can be valuable fertilizers (see 5.4), their over or wrongful application to land can cause pollution. ^{A1} Data from the Environment Agency ²⁾ indicates that agricultural pollution was responsible for about 16 % of the total and most serious category 1 substantiated incidents of water in England and Wales in 2008. ^{A1}

4.1.4 Sources and types of water pollution

^{A1} Text deleted ^{A1}

^{A1} Of the serious agricultural pollution incidents that occurred in England and Wales in 2008 ²⁾, the majority of incidents were from slurry stores and tanks along with land run-off sources. Yard and parlour washings have significantly declined over time as have sources of silage effluent. ^{A1}

4.2 Air pollution

4.2.1 General

Agricultural activities involving the housing of livestock, and the handling, storage and spreading of wastes are likely to cause odour problems.

^{A1} Text deleted ^{A1} Some agricultural activities give rise to the production of gases that can be very harmful to human health and/or cause atmospheric pollution. ^{A1} Many activities are now subject to the requirement for an exemption to be registered under the Environmental Permitting (England and Wales) Regulations 2010 [2]. ^{A1}

4.2.2 Statutory responsibility

The control of odour nuisance and smoke, in England and Wales, is the duty of local authorities' Health Departments. They have the responsibility to inspect their areas, to detect any statutory nuisance and to take reasonable steps to investigate complaints that might be made. In Scotland such nuisance is dealt with under the ^{A1} Public Health etc. (Scotland) Act 2008 [4] ^{A1}.

4.2.3 Nature and extent of odour pollution

Odours can arise from a number of sources including, the breakdown of fresh and stored faeces and urine, from animals themselves, from animal feeds and from the breakdown of other biological materials such as vegetable waste.

In England and Wales, the incidence of complaints about agricultural odours is recorded and reported by the Institution of Environmental Health Officers. Of the reported incidence of justifiable complaints of odours [5], the largest proportion were regarding pigs (47 %), with poultry (25 %) and cattle (22 %) causing lesser problems. The proportions of complaints according to sources or activities were as follows:

— slurry spreading	44 %;
— farm buildings	25 %;
— slurry or manure stores	21 %;
— animal feed products	5 %;
— silage clamps	5 %.

¹⁾ Repeated from ^{A1} BS 6100-5:2009. ^{A1}

^{A1} ²⁾ Data obtained from the Environment Agency website, www.environment-agency.gov.uk/research/library/data/112427.aspx. ^{A1}