

Grounds maintenance —

Part 2: Recommendations for the maintenance of hard areas (excluding sports surfaces)

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- Anglian Water Authority
- Association of County Councils
- Association of Playing Fields and Landscape Managers
- British Association of Landscape Industries
- British Waterways Board
- Commonwealth War Graves Commission
- Department of Transport
- Institute of Groundsmanship
- Institute of Leisure and Amenity Management
- Institute of Water and Environmental Management
- Landscape Institute
- National Farmers' Union
- National Turfgrass Council
- Scottish Natural Heritage
- Sports Turf Research Institute
- Water Services Association of England and Wales

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Foreword

This Part of BS 7370 has been prepared under the direction of the Environment and Pollution Standards Policy Committee.

BS 7370 has been prepared in order to provide those responsible for the upkeep of land that has recreational or amenity use, or a functional purpose that is not solely for agriculture, commercial horticulture or forestry, with a series of recommendations for the various aspects of such maintenance.

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 Part of BS 7370 gives categories of surface for hard areas and maintenance objectives together with recommended methods and procedures for maintenance. BS 7370 at present comprises the following Parts:

- *Part 1: Recommendations for establishing and managing grounds maintenance organizations and for design considerations related to maintenance;*
- *Part 2: Recommendations for the maintenance of hard areas (excluding sports surfaces);*
- *Part 3: Recommendations for maintenance of amenity and functional turf (other than sports turf);*
- *Part 4: Recommendations for maintenance of soft landscape (other than amenity turf);*
- *Part 5: Recommendations for maintenance of water areas¹⁾.*

Further Parts may be prepared, as necessary.

NOTE The numbers given in square brackets throughout the text relate to publications given in "List of references".

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, pages i to iv, pages 1 to 32, 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⁾ In preparation.

Section 1. General

Introduction

The main objectives of a system of maintenance for hard areas are as follows:

- a) to preserve the surfaces in sound structural condition;
- b) to keep them safe for users;
- c) to maintain a good appearance.

These objectives can be achieved only by regular inspection and maintenance.

Regular inspection of all areas is a necessary part of maintenance works if costly repairs, due to neglect, are to be avoided. Additional inspections may be necessary after severe weather conditions, such as frost and snow. A check-list for inspection and maintenance of hard areas is given in Annex A, and a list of organizations concerned with the manufacture, installation and repair of hard surfaces and components is given in Annex B.

When construction or redesign of a hard feature is being planned, subsequent maintenance may be minimized by taking account of the guidance given in this standard.

1.1 Scope

This Part of BS 7370 gives recommendations for dealing with general maintenance and minor repairs to hard areas (excluding sports surfaces). It does not cover major repairs which may involve redesign, but does cover reinstatements after disturbance.

NOTE Roads that are the responsibility of the Highway Authority are not covered, nor are reinforced ground, or water courses.

1.2 References

1.2.1 Normative references

This Part of BS 7370 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 31. For dated references, only the edition cited applies; any subsequent amendments to, or revisions of the cited publication apply to this Part of BS 7370 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.

1.2.2 Informative references

This Part of BS 7370 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 page 32, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this standard the following definitions apply.

1.3.1

to cut back

to trim edges of a damaged surface prior to repair

1.3.2

fall

gradient of an inclined surface

1.3.3

finished surface

visible completed surface

1.3.4

fluxed

diluted with paraffin or creosote to ease application

1.3.5

furniture

items associated with, but not an integral part of, the structures described in this standard

NOTE Furniture includes notices, signs and plant containers.

1.3.6

lean concrete

concrete (or mortar) mix with a reduced cement content

NOTE Lean concrete is also referred to as "weak mix".

1.3.7

pointing

completion of joints between bricks, blocks or paving, either in new work or in the restoration of joints during maintenance

1.3.8

punner

rammer used to compact bulk constructional materials, for example, hoggin or macadam

1.3.9

salt

a chemical compound conforming to BS 3247:1991, used alone or in combination with grit to delay the onset of ice formation or to remove ice or snow

1.3.10

spalling

break up of concrete or masonry surface, loosening pieces sufficiently for them to detach

NOTE Spalling is often caused by frost following water penetration.

1.3.11

subgrade surface

natural ground below an applied surface, e.g. a road

NOTE Subgrade surface is also known as "formation level".

**1.3.12
tack coat**

thin coat of bitumen emulsion applied to an existing surface in order to improve the adhesion of additional material to that surface

**1.3.13
wood float finish**

surface of concrete that has been finished with a wooden float

Section 2. Range of surfacing materials and structures

2.1 Materials

2.1.1 The range of constructional materials which may be used and which are covered by this standard is as follows:

- a) in situ concrete, which is reinforced or unreinforced and which is laid for footpaths and hardstandings;
- b) precast concrete slab paving, of 50 mm, (63 mm or 70 mm thickness, conforming to sizes in BS 7263-1:1990; also in other sizes, and thicknesses in the range 38 mm to 70 mm in a wide range of surface finishes;
- c) natural stone paving, including regional variants such as limestone, sandstone and slate in various sizes and thicknesses;
- d) setts, traditionally in granite or gritstone, but concrete alternatives are now produced in a variety of sizes and finishes, including interlocking designs;
- e) standard clay bricks, of engineering quality or conforming to category F of BS 3921:1985 which may be used in pavings and walls. Purpose-made paving bricks are available generally 50 mm or 65 mm thick with standard brick dimensions (215 mm × 102.5 mm) and in “modular” sizes (e.g. 200 mm × 100 mm). Brick paving can be “rigid” (bedded and jointed with mortar), or “flexible” (laid on sand with narrow sand-filled joints in accordance with BS 6677-3:1986);
- f) concrete paving blocks which are generally available 60 mm, 65 mm, 80 mm and sometimes 100 mm thick, either rectangular (usually 200 mm × 100 mm), or square, hexagonal, octagonal, or a variety of interlocking shapes depending on the manufacturer. These are usually laid as flexible paving on a sand bed, in accordance with BS 6717-3:1989;
- g) fired clay quarry tiles, used externally, provided attention is given to slip resistance;
- h) terrazzo, laid in situ and also in block or tile form, to various loadbearing capabilities;
- i) cobbles, which are natural rounded stones, best laid tight butted, as are also traditional kidney cobbles laid on edge, so that directional patterns are possible;
- j) loose gravel or crushed rock, used in sizes up to approximately 10 mm diameter, suitable only for light traffic and in certain amenity areas;

k) natural self-binding gravels and crushed rocks, i.e. aggregate containing a quantity of fine material (stone dust or clay) and a matrix of gravel or stone, which binds when rolled together. It is generally suitable for light traffic and certain amenity areas. There are regional variations in colour and characteristics and the supply is often strongly localized;

l) surface dressed gravel, comprising a layer of tar or bitumen binder which is overlaid with a layer of clean chippings conforming to BS 63-2:1987. This has the effect of sealing the base on to which it has been laid, producing a more durable and skid resistant surface;

m) coated macadam (conforming to BS 4987-1:1993). The wearing course can be of material from 6 mm to 14 mm nominal size and of open, medium or close texture. In general, this material is suitable for most types of traffic;

n) cold asphalt (fine graded macadam conforming to BS 4987-1:1993) which is suitable for all types of amenity and pedestrian area, but which is not recommended for heavy traffic;

o) hot rolled asphalt (conforming to BS 594-1:1992), an impervious hot rolled material which can be laid with or without precoated chippings and which is suitable for all types of area, but is normally justified only for those which carry heavy traffic;

p) safety surfaces, including loose materials and proprietary surfaces primarily installed to reduce injury from falls, e.g. around children’s play equipment;

q) timber, as treated softwood or hardwood in fences, screens or retaining structures. Some types may be used for decking or block paving;

r) metal, used for a wide range of fencing, furniture, and light fittings.

2.1.2 The range of chemical materials available for use in connection with hard landscapes is considerable and a number of precautionary steps should be taken.

NOTE Attention is drawn to the Control of Substances Hazardous to Health (COSHH) [1] and to Food and Environment Protection Act 1985 (FEPA) Regulations [2], which cover their storage, handling and use.

Corrosive and poisonous chemicals should be handled with great care.

A manufacturer's data sheet is required to be provided by law and should be obtained from the supplier prior to purchase of the product. It is essential that face masks, rubber gloves, goggles and other protective clothing should be worn where indicated, expert guidance should be obtained before using the materials, and reference should be made to manufacturer's information.

Some solvents are highly flammable and others give off toxic vapours, so suitable precautions, such as providing good ventilation, should be taken when handling these chemicals.

Chemicals and solvents may have particular storage requirements, e.g. avoiding frost or direct sunlight, which should be observed to avoid deterioration or fire risk. Manufacturer's documentation should be referred to or their advice obtained.

2.2 Structures

2.2.1 Walls

2.2.1.1 *General*

These recommendations are limited to visual inspection of such structures in order to monitor their safety and appearance. It is essential that any indications of damage or potential defects should be referred to a structural engineer for advice, as freestanding retaining walls over about 1.0 m high are important structural features in the context of public spaces and have to be competently repaired. Repairs should be carried out using equivalent materials, maintaining the original batter (if any).

2.2.1.2 *Free-standing walls*

Free-standing walls may be used for enclosure and shelter, usually in association with other buildings. They may be built in category F or M brick, stone or dense concrete block and attention should be paid to capping and water shedding details (see BS 5628-3:1985).

2.2.1.3 *Retaining walls*

Retaining walls may be used for defining changes of level and supporting earth in cut or fill where sloping banks are not appropriate, being built either vertically or with a slight batter, both for stability and appearance. A wide range of materials is used, e.g. in situ reinforced concrete with or without facings of other materials, such as brick, block, stone, proprietary or patent interlocking systems in concrete or wood or timber in large sections.

2.2.2 Fences and plant support structures

Fences and plant support structures may be used for enclosure and shelter in any context; in a wide range of materials and patterns suitable for urban and rural use. Plant supports range from simple trellis panels fixed to walls to purpose-designed pergolas with elements in timber, brick, concrete or metal.

They are most commonly constructed in timber, metal or concrete, but plastics fencing systems are available and should be considered as low maintenance alternatives.

2.2.3 Steps, ramps and bridges

Steps, ramps and bridges may be used for joining different levels and as an architectural element associated with the approach to buildings. Ramps for vehicles, pedestrians and for the disabled should be integrated into the overall external works design in matching materials.

Footbridges may be constructed from a variety of materials to engineers' designs.

NOTE The scope of this standard is limited to inspection and routine maintenance. Statutory inspection and correction of structural instability is a specialist matter which has to be carried out by a suitably qualified engineer.

2.2.4 Furniture, lighting and signs

Because of the very wide range of designs and situations, detailed adjustment of procedures should be made to suit local conditions.

NOTE See 3.8, 4.3.2, 6.6 and 6.7 for recommendations for cleaning and routine maintenance of these features which are important elements in the overall success of public places.

2.2.5 Garden buildings and shelters

Garden buildings and shelters range from commercially available shelters in steel, concrete or timber with glass or plastics panels, to individually designed buildings of some complexity, for which the full range of building maintenance operations are needed and should be provided by the supplier of the structure.

Section 3. Maintenance objectives for surfaces

3.1 General

Levels of maintenance work should be varied according to the following considerations:

- a) the type of surface;
- b) the quality of construction;
- c) the degree of use;
- d) the maintenance budget.

The original design specification should include a guide to maintenance and whole-life costing.

NOTE 1 Ideally, these four factors are correctly related in the original design and construction. The main problems in maintenance arise where there is a mismatch between them. It is also a general rule that a saving in capital cost by laying a cheaper surface results in higher maintenance costs, especially if that surface is underspecified for the degree of use experienced.

Areas that have been designed for light traffic should be prohibited to heavy vehicles as much damage is done by heavy vehicles to driveways, paths, road verges and planting. Subsequent damage may be avoided by widening the road at bends and providing adequate foundations, drainage and edge protection. Close attention should be given to detail in the design stage so that major repairs can be kept to a minimum. If damage to a particular area or surface recurs, the suitability of the specification/material for that purpose should be reassessed.

NOTE 2 Such damage commonly results from the siting of trees in pedestrian areas where no reinforced access has been provided for maintenance vehicles. Should tree work or replanting be necessary, extensive damage to paved surfaces results.

3.2 Cleanliness

Areas should be kept free from the following:

- a) litter (including autumn leaf fall) [3];
- b) dust and accumulated grit, e.g. from vehicle tyres;
- c) stains, e.g. oil or paint spillage;
- d) graffiti;
- e) weeds, moss and algae.

As the degree to which public places can be kept clean varies with the amount of use, the hours during which areas are accessible, the types of activities occurring locally, and the resources and priorities of the maintaining authority, the following three categories should be established to cover most needs.

- a) Category A comprises very high quality spaces where a prestige environment is essential. Category A areas are often constructed from high quality materials and experience maximum use. Examples are city centre commercial and business districts, historic town or estate centres.
- b) Category B comprises public places in normal use where high environmental quality should be maintained, but use pressures are less than for category A. However, within category B districts, localized areas may qualify for category A maintenance where use demands. Examples are town and suburban shopping districts and leisure centres, country park centres, popular tourist attractions.
- c) Category C comprises all other public spaces not included under categories A or B.

Maintenance objectives for the cleanliness of hard areas should be as given in Table 1

Table 1 — Recommended maintenance objectives for cleanliness of hard areas

Maintenance objective	Category of hard area		
	A ^a	B	C
Sweeping and litter collection	Once per day	Twice per week	Every 7 days to 14 days ^b
Stain removal (e.g. oil and graffiti)	Complete removal within 2 days	Complete removal within 7 days	Complete removal within 7 days to 14 days ^c
Weed and moss growth in paved areas	Weed-free at all times	Should not exceed 1 % of paved area and 20 % of the length of joints within it	Should not exceed 3 % of paved area and 30 % of the length of joints within it

^a This category requires virtually constant observation to monitor the need for cleaning.
^b Litter receptacles should not be allowed to overflow; this may affect the frequency of sweeping and litter collection.
^c This period may be extended to 30 days where frequent inspection is impractical, e.g. bus shelters in rural areas.

3.3 Integrity of material

Where repairs are carried out, matching materials should be used. It is particularly important that trenches across block paved or flag paved areas should be reinstated in accordance with BS 7263-2:1990 and BS 6717-3:1989, using these units and not other materials, as most unit paving can be lifted and reused with minimal damage. Where special materials (e.g. a particular brick) are used and where space permits, a small stock from the original construction should be retained for repairs. Repairs should include adequate placement and consolidation of the subgrade and the finished surfaces should conform to 3.5 to 3.8.

3.4 Moss and algae

Moss and algae should not be allowed to cover more than the following percentages of the total areas:

- a) 1 % of the paved surface for general public areas;
- b) 1 % to 5 % for public paths in woodland or parks;
- c) 5 % to 20 % in small-scale pavings (i.e. gravel or cobbles) which are infrequently used, e.g. in churchyards or ancient city by-ways.

Percentage cover may be estimated by the quadrat method described in A.6 of BS 7370-3:1991.

A clear route should be maintained across all areas.

3.5 Evenness

Where a risk of slipping exists, warning notices or handrails should be installed. All pavings should be maintained to the levels and falls originally constructed (see BS 6717-3:1989 and BS 7263-2:1990). Movement of paving units should not be allowed to produce a differential between adjacent units greater than 6 mm. If, under the load for which the paving was designed, the foundation below paving permits surface units to rock by more than 5 mm at any point, then relaying should be undertaken. Differential settlement should not exceed 6 mm under a 3 m straight edge (see BS 7370-3:1991), or 10 mm for block paved areas (see 10.2 of BS 6677-2:1986).

3.6 Breakage

3.6.1 Natural stone or precast units

Generally, concrete footpath paving should not show more than 10 % broken units overall. Concentrated damage, e.g. by vehicles tracking across or at the edges of pavements, should be repaired or upgraded and rebuilt even if less than 10 % of the total area is affected. In areas of high quality materials, e.g. terrazzo slabs, broken units should not exceed 5 %.

NOTE Natural stone or precast units may fracture without further effects other than slight visual detriment.

3.6.2 In situ rigid material

In situ rigid material should be designed with adequate movement joints. Some additional cracking should be allowed for due to the high cost and disturbance involved in replacement. This cracking in concrete or terrazzo paving should not result in fragments of less than 1 m² covering more than 20 % of each bay of the material, or fragments of less than 0.25 m² covering more than 1 m² at any one location within each bay. All cracks wider than 6 mm should be raked out and repaired as soon as possible, as should any spalling or weathering at the edges.

3.7 Permeability

3.7.1 General

Hard surfaces are broadly classified as pervious or impervious and should be treated in accordance with 3.7.2 or 3.7.3 as applicable.

The maintenance of hard areas should ensure that the surface and surface structures retain their designed hydrodynamic properties in terms of flow and permeability.

An increase in moisture content in some types of material used for base construction, and in practically all types of subsoil, results in reduced strength and durability, therefore the outlets from any system of subsoil drainage beneath paved areas should be periodically inspected and cleaned.