

Grounds maintenance —

Part 5. Recommendations for the maintenance of water areas

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- British Waterways Board
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- Institute of Water and Environmental Management
- Landscape Institute
- National Farmer's Union
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- Scottish Natural Heritage
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- Water Services Association of England and Wales

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Foreword

BS 7370 has been prepared in order to provide those responsible for the upkeep of land and/or water that has a recreational or amenity use, or a functional purpose, 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 categorizes water and wetland areas, their uses and purposes, together with recommended methods and procedures for maintenance. BS 7370 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 areas)*

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 the maintenance of water areas*

Further parts may be prepared, as necessary.

NOTE 1 Further reading material on ecological management is listed in annex A. The numbers given in square brackets throughout the text relate to references given in the bibliography.

NOTE 2 Table 2 is reproduced with the permission of Blackwell Scientific Publications.

Annexes A to F are informative.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 28, an inside back cover and a back cover.

Introduction

The different types of water areas that may be encountered in grounds maintenance may comprise running, still, or ornamental water. Such water areas may be natural features, or be artificially created. They may be fed naturally, from surface run-off, and springs; or by artificial means through channels, pipes or by pumping from another source. Water areas are usually multi-functional, and can serve purposes additional to the conservation, recreation and amenity uses for which the grounds maintenance organization is directly responsible. These other functions could be the responsibility of other organizations whose needs may predominate. Thus, when planning and undertaking grounds maintenance, it is essential to have a full understanding of the prime purposes and uses of the particular water area together with the effects of grounds maintenance activities. A balance should be struck between the many competing needs and a management plan prepared which embraces all these elements.

NOTE BS 7370-1:1991 describes management plans and objectives.

1 Scope

This part of BS 7370 gives recommendations for grounds maintenance relating to water areas that are within or adjacent to the grounds.

This standard does not constitute a textbook on the ecological, recreational, design or engineering matters raised, but clauses 4 and 5 explain the ways in which water is used by humans, flora and fauna. This will assist in reconciling the often conflicting management and maintenance requirements of water and wetland areas, given in clause 6.

Reference is made to legislative aspects in annex B although this standard should not be taken as comprehensive or definitive in this regard.

This standard provides recommendations to enable a detailed inspection and maintenance schedule to be prepared for each site. It does not cover the maintenance of wetland or tidal areas.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of BS 7370. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS 7370-1:1991, *Grounds maintenance — Recommendations for establishing and managing grounds maintenance organizations and for design considerations related to maintenance*.

BS 7370-2:1994, *Grounds maintenance — Recommendations for the maintenance of hard areas (excluding sports surfaces)*.

BS 7370-4:1993, *Grounds maintenance — Recommendations for maintenance of soft landscape (other than amenity turf)*.

3 Definitions

For the purposes of this part of BS 7370, the definitions given in clause 2 of BS 7370-1:1991 apply, together with the following.

3.1

arisings

material won from excavation

3.2

batter

slope

3.3

bund

embankment or mound of soil or other material constructed for screening or containment

3.4

calcifuge

plant which will not normally grow in calcareous or limed soils

3.5

cascade

small waterfall, especially forming one in a series or part of a large broken waterfall

3.6

concrete bagwork

bags filled with wet, lean concrete which has been allowed to set

3.7

culvert

pipd water course

3.8

draw-off

take water out of a lake or other water system

3.9

drawdown

reduction in water level caused by drawing off

3.10

dredging

Removing soil and plant remains from below water

3.11

dredgings

material removed by dredging

3.12

emergent plants

plants, rooted in the water bed, that grow through the water into the air, usually at the margin of the water area

3.13

eutrophic

rich in plant nutrients, especially nitrogen and phosphorus, and generally low in dissolved oxygen

3.14

floodplain

area of land prone to flooding

3.15

floodwater

water on the floodplain

3.16

gabion

mesh cage which holds stones

3.17

geotextile

artificial porous membrane used to enhance the physical properties of soil, especially for the protection of the soil surface during the establishment of vegetation

3.18 hoggin

as-dug clay/gravel material suitable for tracks which carry occasional traffic

3.19 large raised reservoir

body of water above natural ground levels with a capacity of more than 25 000 m³

NOTE Large raised reservoirs are subject to the provisions of the Reservoirs Act 1975 [1].

3.20

mesophyte

plant which grows in an environment which is neither very dry nor very wet

3.21

outfall

structure by which discharge pipes enter rivers or other water systems

3.22

poaching

damage caused to turf by treading during wet weather; by livestock hooves or human feet

3.23

pontoon

floating platform or structure

3.24

punner

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

3.25

revetment

protective layer on the bank that reaches at least to the water surface, which prevents scour and erosion from water action

3.26

riparian owner

owner of land adjacent to bodies of water (see annex B)

3.27

run-off

water coming off the land following rainfall

3.28

siltation

accumulation of silt in a water body

3.29

sluice

vertical gate which can be opened to let water through

3.30

spalling

break-up of concrete or masonry surface, in which pieces are sufficiently loosened for them to become detached

NOTE Spalling is often caused by frost following water penetration.

3.31

spillway

structure over which excess water can escape

3.32

spoil

excess material after excavation

3.33

sump

pit for the collection of water

3.34

surface water

water on the surface of land

3.35

trash rack

grating to prevent debris entering a culvert

3.36

watercourse

ditch, stream or river

3.37

weir

structure in a watercourse or body of water that maintains the water level higher than would be achieved naturally

3.38

wetland

area, usually adjacent to watercourses or other bodies of water, that is naturally poorly drained

3.39

windfirm

secure against root disturbance by wind

3.40

windthrow

uprooting in high wind conditions

4 Categories of water and wetland areas

4.1 Running water

Running water may include rivers, streams, ditches, drains and flood relief channels, of which the main purpose is to convey water. However small pools of relatively static water may be included within its length. The flows and water levels vary with the weather and season of the year. At times they may be relatively static or even dry.

Problems associated with watercourses include overflowing, bank and bed erosion, blockages caused by vegetation growth, siltation and accumulation of debris, litter, and other forms of pollution.

Maintenance should be aimed at keeping a free flow of water and controlling erosion while conserving environmental and recreational functions.

4.2 Still water

Still water may include canals, inland marinas, lakes, ponds and pools, water supply and hydro-electric reservoirs (see B.8), storage ponds, balancing ponds or lagoons and flooded gravel pits. The distinguishing feature is that they collect and store water. However, their water level can fluctuate, often very rapidly, both with the weather and seasons of the year, and as water escapes or is released into or drawn from them. Most have watercourses, drains, and surface run-off flowing into them, and a means by which water can flow naturally out of them. Some have a purpose-built means by which they can be emptied or by which water can be drawn off. Due to their relatively large surface area and volume, there is little apparent flow of water across them. However, wind can produce considerable wave action as can powered boating activities.

Problems associated with these relatively static bodies of water may include public safety, eutrophication, variation of water levels, leakage, bank erosion through wave action, siltation, vegetation growth at the water's edge and pollution.

Maintenance activities should include regular inspection of water retaining structures for leakage and possible failure. Level control and draw-off features, such as sluices, valves and overflow weirs and spillways, should be regularly cleaned, inspected and checked to ensure that they are functioning correctly and safely.

NOTE Attention is drawn to the Reservoirs Act 1975 [1] and B.8 which covers large, raised reservoirs.

4.3 Ornamental water features

Ornamental water features include ornamental ponds, artificial streams and channels, cascades and fountains designed for their visual appeal.

Maintenance should be aimed at protecting equipment and conserving or enhancing the visual setting whilst minimizing the problems normally associated with stagnation, turbidity, leakage, erosion, mechanical/electrical failure and poor design of elements.

NOTE For information on the elements of small scale water features which require modification to allow future maintenance, see annex C.

4.4 Swamps, marshes and mires and their development

NOTE The detailed management of swamps, marshes and mires is a subject outside the scope of this standard. However, as these ecotypes are dependent on ground water and water levels, as well as being extremely vulnerable to pollution and human access, knowledge of their development should aid in establishing their principles of maintenance.

A swamp, including reed bed areas, is a wetland formed on a mineral based soil which is flooded more or less all the year round. It is usually dominated by the common reed *Phragmites australis*.

A marsh is a wetland with a mineral-based soil, where the summer water level is close to the soil surface, but seldom rises much above it.

As organic matter accumulates on or below the water surface a mire, an area of wet peat develops. Peat is a deposit of modified plant residues formed under wet and restricted oxygen conditions.

A bog is a mire formed under continuous waterlogging, where there is no access to calcium or more than tiny quantities of plant nutrients. A bog in its actively growing phase is normally dominated by bog moss *Sphagnum* spp. and a few associates. The surface soil, such as it is, is almost absent, highly acid and dominated by calcifuge plants.

A fen is a mire which has developed in a situation where drainage water carries calcium and dissolved plant nutrients into the developing mire.

Consequently the flora found in these situations is not calcifuge and contains very many more species.

A carr is a fen, where the surface has started to dry out owing to the accumulated peat and raw plant residues; and where woody plants have seeded in from the surrounding land. Carr may be of several types, with a succession from a swamp carr in which the surface is unstable; via a semi-swamp carr in which the surface is sufficiently stable to support tree growth; an open carr in which the trees are some distance apart; to a closed carr in which the tree canopy is complete.

Management of swamps, marshes and mires should be directed at the following:

- a) maintenance of water/groundwater levels;
- b) prevention of pollution from non-natural sources, for example, fertilizers, septic tank overflow, fuel oil spillage;
- c) restriction of human access, as trampling can be extremely damaging;
- d) possible use of raised walkways where human access is allowed;
- e) removal of inappropriate vegetation.

5 Uses and purposes of water areas

5.1 General

Water areas often fulfil more than one function. All the functions should be listed in order of priority to enable maintenance objectives to be set. Where possible, conflicting requirements should be reconciled rather than neglected.

5.2 Conservation

5.2.1 General

Water areas and wetlands may support a wide range of plant, invertebrate, fish, amphibian, bird and animal life. The ecosystem that develops on a particular body of water depends partly on immutable factors such as its geographical location and the local topography, geology and climate. The natural source and acidity of the water supply also play a major part. However, changes in the water quality and hence the ecosystem may occur through management practices on the land surrounding the water area and within its catchment area. Of particular concern should be the levels of fertilizer and pesticide use, waterfowl faeces and other pollutants that may find their way into the water [2 and 3].

Other factors that may influence the ecosystem are as follows:

- a) the shape, size and varying depths of the water area;
- b) the extent to which trees and vegetation allow sunlight to reach the surface;
- c) the degree to which the turbidity of the water will allow light to penetrate;
- d) water velocities;
- e) the extent of fluctuations in the water levels;
- f) recreational and functional uses associated with the water body.

The ecosystem always strives to achieve its potential. Water areas with a variety of depths and habitats encourage a wide range of species. The number of plants and animals present invariably fluctuates because of the effects of changes in climate, food supply, disease and the inter-action of species.

It should be recognized that apart from short-term fluctuations, which may or may not exhibit a trend, there are sustained long-term changes. This is particularly true in shallow areas of still water where surface drainage imports matter in suspension which is then deposited as silt, leading ultimately to a decrease in depth. Drainage water also carries dissolved substances which tend to enrich the water making it more productive. Both these procedures eventually change the ecosystem; silting encourages emergent growth which in turn causes the silting process to accelerate, while the enrichment of the water alters the composition and nature of the aquatic flora and fauna.

5.2.2 Plant life

5.2.2.1 General

Plants are an important part of the aquatic ecosystem, both on the banks and in the water, forming a living and always varying feature which may add to the visual appeal of the water. Plants provide shelter and are the basis of the food chain and as such are an essential element in the lives of animals, including fish, insects and birds. However, excessive plant growth should be controlled to prevent the plants from taking over by choking channels, by overgrowing shallow areas and banks and by damaging adjoining structures by root growth. Excessive growth may also interfere with recreational and functional uses of the water area. Siltation in shallow water areas should be minimized by preventing the establishment of progressively greater amounts of vegetation, the decaying remains of which add to the deposition of silt and further speed the process. As the water depth reduces, reed beds establish and gradually spread. Within a few years scrub and brushwood start to encroach, and the former water area becomes occupied by wet-tolerant land plants. The objective should be to halt this succession at a stage where there is a reasonable variety of plant types but without too much encroachment into the water or into open water areas set aside for recreational and functional purposes.

5.2.2.2 Water plants

Water plants may be divided into a number of groups (see annex D, a) to e)), each group causing a different problem when excessive growth occurs, which should be recognized and the appropriate control measures taken. Plant growth may be affected by one or more of the following factors:

- a) the depth of water;
- b) light penetration;
- c) root disturbance;
- d) soil at the bottom of the water;
- e) the availability of nutrients.

5.2.2.3 Bankside vegetation

Bankside vegetation may be divided into groups (see annex D, f) and g)). Few trees and shrubs indigenous to UK are able to survive with their roots totally in water, but there are many which may survive with roots in waterlogged soil provided there is a few inches of aerated soil at the surface.

5.2.2.4 Wetland vegetation

A number of different types of wetland exist, which support a variety of plants, examples of which are listed in annex D.

5.2.2.5 Plants suitable for planting in and around water areas

Many of the plants referred to in annex D may be used when new planting is required but there is a wider range of plants which should be considered for incorporation when managing the landscape. Examples of these plants are listed in annex D.

5.2.3 Invertebrates

The invertebrate life that develops is to a large extent governed by the local plant life and water conditions. Thus the management and maintenance practices employed to control these factors and any functional uses can have a major influence. Recreational activities have little direct influence on the invertebrate population, provided that the turbidity of the water is not greatly increased.

Invertebrate communities should be allowed, where possible, to attain their full potential by incorporating a diverse range of features, including variations in water depths and velocities, and variations in lake or river bed material.

5.2.4 Amphibians and reptiles

Amphibians (primarily newts, toads and frogs) are linked with the water by having to breed there, but few remain aquatic outside the breeding season which generally is from March to June. Therefore, the following measures, which may harm amphibians, should be carried out only when essential:

- a) straightening or steepening the banksides;
- b) changing the water level;
- c) denuding the bankside vegetation;
- d) dredging, particularly during the hibernation season when some amphibians hibernate underwater in the mud. The hibernation season is from October to February.

The principal reptiles in Britain, which include lizards and snakes, require areas of shelter such as deep vegetation, logs or natural debris, some of which should be retained when clearing the banks of lakes or rivers.

5.2.5 Fish

British fish include salmonids (salmon, brown and sea trout and grayling) and coarse fish (eel, dace, chub, barbel, perch, pike, roach, rudd, bream, tench, carp, bullhead and stickleback). Fish requirements vary greatly but the following parameters should be considered when carrying out maintenance work:

- a) water depth and velocity;
- b) river/lake bed material, i.e. gravel, mud, etc.;
- c) water temperature;
- d) oxygen supply;
- e) bankside and aquatic vegetation;
- f) invertebrate supply;
- g) cover and shade;
- h) water quality and clarity;
- i) fish spawning period (see Table 1).

Local and national angling bodies and the Environment Agency (see B.1) should be consulted when preparing the management plan and maintenance schedule.

5.2.6 Mammals

Mammals native to the UK include otters, water voles and water shrews, whereas those that have been imported are coypu and mink.

Care should be taken not to overmanage banksides, particularly those open to the public, as the depleted food supply and lack of cover result in an impoverished mammal population. Otter holts (resting or breeding places) are often located in the roots of mature trees, especially sycamore or oak, on the immediate river bank. Should these trees be removed, the survival of the otter in this location is doubtful.

In large numbers or in the wrong place, mammals may need to be controlled, for example rabbits burrowing in water retaining banks or mole activity causing damage to ditch margins. Expert advice in effective control measures should be obtained.

5.2.7 Bird life

5.2.7.1 General

Water areas attract a large number of bird species, which may be grouped as follows:

- a) native resident birds;
- b) migratory birds; either breeding in Britain during the summer and then spending the winter in warmer lands or making a short stop during a migratory passage or overwintering before returning to Arctic breeding grounds;
- c) foreign species; which have often been introduced into public parks and private estates and may require special habitats and food for survival; specialist advice should be sought regarding their particular needs.

The species of bird to be found depend partly upon the type and location of the particular water area and upon the habitat and sources of food available, both of which may be affected by the grounds maintenance policies and practices and by recreational and other functional uses of the water.

Where birdlife is to be encouraged, protected areas, such as islands, and nesting boxes should be provided. The configuration of banks, vegetation structure and ground texture, and the protection from predators afforded by waterside vegetation and accessible islands can all affect breeding birds. Maintenance should be designed to avoid making changes to the area which reduces its value, for example, raising and hardening banks to control erosion.

5.2.7.2 *Breeding birds*

The species of breeding birds at still water areas may be divided as follows:

- a) birds which build nests resting on the water in beds of aquatic vegetation, e.g. great-crested grebe, coot, moorhen and mute swan;
- b) ducks and geese which breed away from the water area but which bring newly hatched young to the water for food and protection, e.g. mallard, shelduck;
- c) diving ducks which breed on the banks and take chicks to the water as in b) e.g. tufted duck;
- d) passerine species which build nests woven around reed stems or amongst sedges, e.g. reed and sedge warblers;
- e) waders which nest on surrounding damp grassland and feed in the meadows and along water margins, e.g. redshank, lapwing and snipe.

The breeding season is generally from April to August and disturbance at this time should be avoided.

5.2.7.3 *Passage birds*

Most reservoirs, lakes and tidal waters provide aquatic birds with essential resting and feeding areas whilst in passage. The birds should not be disturbed, otherwise they will pass on, possibly before they have reached optimum condition for migration and breeding. Marginal feeders, such as waders, are most susceptible to disturbance as they feed on exposed mud and prefer fluctuating water levels. When feeding conditions are satisfactory, particularly in autumn, they stay for long periods, even into winter. These species give great pleasure to naturalists who would, therefore, wish to prolong their stay.

5.2.7.4 *Wintering birds*

In Great Britain, reservoirs, lakes and other large bodies of water, e.g. gravel pits, are important for overwintering waterbirds, the majority of which breed in Scandinavia. Both surface-feeding and diving ducks use these bodies of water.

Surface-feeding duck species, e.g. mallard, teal and widgeon feed on fields away from the water at night, flying at dusk and dawn. During the day, however, they rest on the water in shallow bays and along the water edge, grazing on pasture immediately adjoining the water. Shoveler and gadwall use only the shallow areas of water close to the shore. Diving ducks, e.g. tufted duck, pochard and goldeneye, may be found in deeper water away from the shoreline and are particularly sensitive to disturbance by any form of water-based activity.

5.2.7.5 *Treatment to minimize disturbance to birds*

Disturbance to birds may be minimized by identifying bird habitat areas and isolating them from water based activity, from walkers, and from anglers. Isolation should be by either restricting activities to one section of the water or, where there are two or more bodies of water in close proximity, restricting one of the bodies to use by birds.

5.2.7.6 *Control of birds*

A particular problem may occur when introduced water fowl, such as Canada geese, or even some native species (e.g. greylag geese), proliferate to such an extent that their faeces cause severe water pollution and their activities degrade the banks and disturb the plants. The problem may be prevalent when the fowl are encouraged by feeding from the public.

Advice on control methods should be obtained from the local office of the statutory nature conservation agency. Control methods may include the following:

- a) discouragement, for example physical barriers;
- b) egg piercing;
- c) culling;
- d) shooting within the open season.

NOTE Attention is drawn to the Wildlife and Countryside Act 1981 [4] which covers the control methods that may be used.

5.2.8 *Ecological management*

Ecological management may seek to:

- 1) maintain the ecological status quo;
- 2) increase ecological diversity;
- 3) develop one aspect of the ecological potential.

The factors involved in ecological management are complex and while some published information is available (see annex A) attempts at management should not be made without expert advice.

Management plans and maintenance schedules should take due account of protected and other species.

NOTE Attention is drawn to the Wildlife and Countryside Act 1981 [4] which lists the protected species.

5.3 *Amenity and recreation*

5.3.1 *General*

Areas of open water offer benefit to the community in terms of both their passive amenity value and their active recreational potential.

It should be noted that the amenity value of open water arises from its visual impact within the landscape and from the ecology of the water and its immediate surroundings.

5.3.2 Designed landscapes

5.3.2.1 Water features

Whether natural or artificially created, water features can be important elements in landscape schemes, therefore maintenance operations should respect the intentions of the original design, as follows:

a) *Lakes, meres, ponds, canals, moats*: Some water areas are intended to appear natural and usually have grass or planting at the edges and a proportion of the surface covered by water plants. The margins are soft and may, for example, have a mud or gravel beach, marsh vegetation or an abrupt grass bank above open water. Revetments designed with due regard for aesthetics should be considered where erosion is a problem or access is required to the water.

More formal water areas often have hard edges and the water level is usually critical to the appearance of the feature; therefore the means of replenishment and maintenance of the system should be considered.

For visual reasons the intended proportions of open water to aquatic vegetation should be preserved. The original design may also be compromised if trees and shrubs at the edges spread further than intended, obstructing vistas, obscuring views or making the water area appear smaller by shading.

b) *Pools, tanks, cisterns*: Smaller artificial water areas often have hard edges (for example timber, stone or brick) and may be raised above the surroundings.

The water level is often intended to be maintained very close to the brim. Aquatic vegetation may be appropriate, or the water may be designed to be clear, allowing views of the bottom of the pool. A pool intended mainly to reflect a building or other feature should be kept clear of surface vegetation.

It may be appropriate to cover the edges of some water features with moss and ferns but these should not be allowed to grow in more formal settings.

c) *Streams, rills, waterfalls, weirs, cascades*: Moving water may be provided from a natural source or by recirculation and the sound, as well as the appearance of water may be of importance.

d) *Fountains*: Fountains may be set within a water area or may be separate features, often including sculpture. They may have a simple jet or multiple sprays of various shapes and include complex programmes of variations, often synchronized with lighting effects.

The water supply should be satisfactorily maintained, otherwise features with conspicuous fountain nozzles will give an appearance of neglect.

5.3.2.2 Planting

5.3.2.2.1 Planting in ornamental and other waters

Success in the establishment of aquatic and wetland planting should follow matching of plant species to the appropriate habitat; or manipulating the environment to suit the range of plants it is desired to cultivate.

NOTE The range of plants used to enhance both natural and artificial water features is derived from aquatic and wetland native species, their cultivars, and from exotic species and their range of cultivars. All these derive naturally from habitats equivalent to the types detailed in clause 4, and the plant species in character naturally belong to the assemblages typical of the open water and wetland habitats listed in annex D.

5.3.2.2.2 Planting in drawdown zone

Where the water-level fluctuates greatly and exposes a wide zone of land each year, as in reservoirs, suitable plantings should be made to soften the landscape. Suitable species are given in annex D.

5.3.2.2.3 Grassed banks

Areas of grass adjacent to the water's edge may be subject to a range of pressures, from grazing animals or birds, human visitors walking, angling or playing games, or from vehicular traffic and car parking. Waterlogged or wet areas should not be allowed to suffer any vehicular use, and very little use by humans or large grazing animals. Dry areas, however, can tolerate such uses perfectly well. High banks or well-drained slopes differ from other grassland areas only in their need for fencing to prevent accidents and erosion of banks.

Where possible, the wear tolerance of moist or wet grassland should be improved by drainage. If it is not possible, and some traffic has to be carried, roadways and hard standings should be constructed for vehicles, and board-walks or raised pathways for pedestrians. Change of grass species makes only very minor differences to wear tolerance, but if amenity areas which are subject to pedestrian wear and mown fairly often have to be reseeded, the main (or sole) grass should be one or more turf types of perennial ryegrass *Lolium perenne* selected for wear tolerance. If additional turfgrasses are wanted, rough-stalked meadow-grass *Poa trivialis* and bentgrasses *Agrostis* spp., especially creeping bent *A. stolonifera*, may be used if it seems especially important to use species tolerant of wet conditions. For coarser grassland, an agricultural seeds mixture should be used if grazing by farm stock is intended. If a "hay meadow" or wild flower sward is required, nearby grassland may give the best indication of the species worth sowing, but appropriate grasses are likely to include, in addition to those mentioned above and in annex D, two species of cat's-tail *Phleum pratense* and *P. bertolonii*, marsh foxtail *Alopecurus geniculatus*, reed canary-grass *Phalaris arundinacea*, meadow fescue *Festuca pratensis* and the soft-grasses *Holcus* spp.