School Playing Fields

Planning & Design Guidance

sportscotland

Foreword

Playing fields are an important part of the school estate. They are an essential resource for many of our most popular sports and can help children adopt a more active lifestyle. And through the extended use of playing fields for extra-curricular activity and for community use, they play a role in sustaining such a lifestyle beyond the school curriculum.

A glance through the 'Policy Context' section of this document reveals that the protection and development of school playing fields is vital to many current policies and initiatives. And this importance is recognised: there has been a huge investment in the school estate over recent years. As part of this investment, many new synthetic grass pitches have been provided and grass playing fields improved, creating an expectation that new school playing fields should be of the highest quality. This should indeed be the aspiration. Yet there are many competing pressures which impact on the funding that is available for playing fields.

Whilst we recognise these competing demands, we believe it is essential that new and refurbished schools are provided with sufficient well-constructed and well-maintained playing fields. We hope that the following guidelines will help all those involved in developing school facilities to provide playing fields of the right quantity and quality and to ensure these are properly maintained.

Only by providing enough quality school facilities for curricular, extra-curricular and community use will school playing fields make their full contribution to our vision of increasing participation and improving performances in Scottish sport.

Julia Bracewell OBE
Chair, **sport**scotland

Contents

The writing of this guide was prompted by the high level of current and planned investment in new and replacement school facilities and by the realisation that there was little up to date design advice on school facilities for physical education and community sport.

Section 1: Background

This document extends **sport**scotland's series of design guides for school sports facilities. It's divided into three parts. This section puts the valuable role of playing fields into a wider policy context; the next section provides advice on calculating space requirements for playing fields; and the last section gives advice and guidance on detailed layout, design, specifications and maintenance for both primary and secondary school playing fields.

It follows on from the earlier documents *Primary Schools Sports Facilities* and *Secondary School Sports Facilities: Designing for School and Community Use*.

The writing of this guide was prompted by the high level of current and planned investment in new and replacement school facilities and by the realisation that there was little up to date design advice on school facilities for physical education (PE) and community sport. The requirements of financing projects, advances in synthetic grass pitch technology and changes to the way school PE and sport are delivered all have implications for choosing appropriate playing field provision.

The role and importance of playing fields

PE is an essential component in encouraging positive attitudes to physical activity and a healthy lifestyle. Educating children to remain physically active throughout their lives is now a key feature of national and local health policies. When children and young people are fit and healthy there is evidence to suggest that they are more able to concentrate, learn and do well in school. PE can also develop pupils' social skills and self esteem, and contribute to the social life and ethos of a school. After school sport and physical activity can also contribute to these objectives and are essential to meet national physical activity targets for children and young people.

School playing fields can also be a valuable resource for community sport. Both natural and synthetic grass pitches can be used for training and matches for local community sports clubs. Synthetic grass in particular is capable of accommodating significant levels of community use at evenings and weekends and can usually be made available for such activity. Due to the possibility of wear and tear, community use of grass pitches will be much more limited but may still be significant for many schools.

School playing fields are required to support all of the above objectives and must be provided in sufficient numbers, to the right design and to an appropriate quality.

Although the focus of this document is on school playing fields, school grounds have a wider purpose and value. They're made up of a range of areas which are used for aesthetic, assembly, play and education purposes and are important for the effective administration of school sites and the social and educational development of pupils.

They are places where children can make friends and develop social skills, share experiences, explore and challenge. They are an inclusive means of providing for healthy exercise, for creative play, for learning through doing, and for putting children in touch with the natural world. They can be an important teaching resource, providing opportunities for exciting, stimulating lessons which can inspire children to learn.

With this in mind, it will be important to find a balance between the spaces required for such purposes and for outdoor PE and sport. Other functions of school grounds, such as Sustainable Urban Drainage Systems must also be considered but should not restrict the size or flexibility of school playing fields.



Policy context

A number of recent studies and policy initiatives relevant to the provision of playing fields have prompted the creation of this document, and informed its development. The following pages sum the points of key relevance for each policy or initiative.

National Physical Activity Strategy

Scotland's Physical Activity Strategy, *Let's Make Scotland More Active*, sets targets for increasing levels of physical activity in Scotland. The strategy sets the target of 80% of children and young people undertaking at least one hour of moderate physical activity on most days of the week. The importance of the school environment and, in particular, of PE in helping to achieve this is recognised. The lack of suitable local facilities was cited as a significant barrier to participation amongst young people and one of the strategic objectives is to develop and maintain long-lasting, high quality physical environments to help inactive people become more active.

The provision of sufficient good quality school playing fields can make an important contribution towards achieving the aims of this strategy.

Ministerial Review Group on Physical Education

The Review Group was set up as a direct result of key findings of the National Physical Activity Taskforce. The Taskforce identified that there were significant problems with the PE curriculum which had led to a growing number of pupils opting out of core PE and an increasing number of schools reducing their allocation of time to the subject. The Group's remit was to consider how schools could be supported in providing quality physical education meeting the needs and talents of all pupils. The Group reported back in 2004, making several recommendations on improving the curriculum, supporting teachers and access to facilities, with the overarching aim of increasing participation in PE. The Group recognised the contribution and importance of guidance such
as this document and stated that facilities should be appropriate to the size of the school and the maximum level of use at any one time.

Importantly, the Group stated that future new or refurbished facilities should ensure well planned space for physical education and physical activity appropriate for the needs of both schools and the wider community.

Sport 21

Sport 21, the national strategy for sport in Scotland, sets out three co-dependent visions of a sporting Scotland as:

A country where sport is more widely available to all.

A country where sporting talent is recognised and nurtured.

A country achieving and sustaining world class performances in sport.

The review of this strategy identified targets for the period 2003-2007.

"School grounds are places where children can make friends and develop social skills, share experiences, explore and challenge."

A sufficient supply of quality facilities, access to local facilities and opening up school facilities for community use are all targets of particular relevance to school playing fields. Sport 21 identifies specific targets for fostering and encouraging increased participation in sport by school-age children and (like the PE Review Group and National Physical Activity Strategy) recommends a minimum of two hours of PE per week. Of the eleven key targets in Sport 21, targets one to three are of particular relevance to school playing field provision:

Target 1

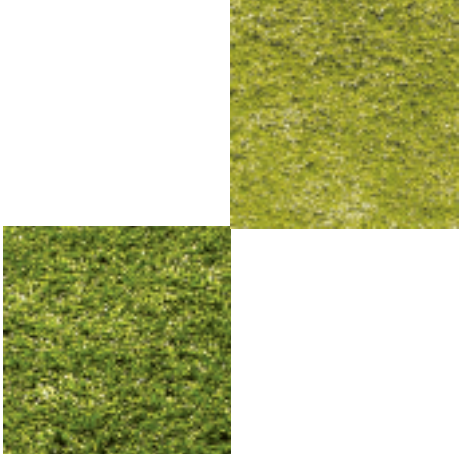
That 80% of primary schoolchildren are physically active, measured as accumulating at least one hour of moderate physical activity on at least five days per week.

School based physical activity and sport, both curricular and extra-curricular, is central to meeting this target. More curricular time, successful Active Schools programmes and access to the right quantity and quality of indoor and outdoor facilities will all play a part in meeting this target.

Target 2

Aims for progress towards all children receiving at least two hours of high quality PE each week.

Schools are again central to this target, which will require sufficient quality indoor and outdoor facilities as well as changes to the curriculum of many schools and a rise in the number of qualified PE teachers. In calculating school playing field requirements, it will be important to demonstrate that this target can be met. Scottish Ministers have made clear the Scottish Executive's desire to see progress towards this target.



Target 3

Aims for 85% of 13-17 year olds to be taking part in sport, in addition to the school curriculum, at least once a week.

Much of the effort towards meeting this target focuses on participation in sport by girls as well as pupils with additional support needs and current non-participants. Secondary school facilities and secondary school sport again have an important role to play in meeting this target.

Active Schools

In February 2003, Active Schools was identified as a key element of the Scottish Executive's drive to get more Scots more active – a commitment outlined in the National Physical Activity Strategy. Active Schools offers children and young people the motivation and opportunities to adopt active, healthy lifestyles now and into adulthood. These opportunities are available before, during and after school, as well as in the wider community. Active Schools also aims to introduce more physical activity into daily life through active travel, play and dance.

The Active Schools Network of Managers and Coordinators is responsible for facilitating the development of a range of planned physical activities and sport in both school and community settings. The commitment of the Head Teacher and senior management at a school is vital in driving this forward. An Active School will send out a strong message on physical activity and sport to a wide audience. In seeking to develop an 'Active School', the school should:

- Provide quality, safe and fun physical activity opportunities, including sport, within both the formal and informal curriculum.
- Actively promote positive attitudes towards participation in physical activity with pupils, teachers and families.
- Ensure that physical activity and sport complements school policy on inclusion and equal opportunities.
- Ensure physical activity and sport is referenced within the school development plan.
- Encourage and support pupils to reach their full potential within physical activity, including sport, and physical education. And, most significantly for the planning of school playing fields;
- **Provide adequate resources and funding for physical activity (including sport).**

Health Promoting Schools

The Scottish Executive has set a national target for every school in Scotland to be a Health Promoting School by 2007. This target involves the development of a whole school approach to promoting the physical, social, spiritual, mental and emotional well-being of all pupils and staff. To help schools achieve this target, the Scottish Executive has set up the Scottish Health Promoting Schools Unit (SHPSU) to champion, facilitate and support the development of Health Promoting Schools throughout Scotland. The national framework for Health Promoting Schools: *Being Well – Doing Well*, launched in February 2004, sets out a broad national consensus about the nature of a Health Promoting School.

The document outlines the critical role that the school environment plays in the development of a health promoting school and sets out the key areas which should be considered when refurbishing or rebuilding school buildings.

The value of school grounds and playing fields in developing and supporting the health promoting school is acknowledged.

Building Our Future – Scotland's School Estate

Building Our Future – Scotland's School Estate is a national strategy developed by the Scottish Executive and the Convention of Scottish Local Authorities (COSLA), concerned with raising and maintaining the quality of the school estate across Scotland. The principle means by which the school estate strategy will be realised is through a separate School Estate Management Plan (SEMP) for each local authority in Scotland.

The strategy recognises that the school environment is central to achieving the National Priorities in Education and identifies the need to create schools which support learning and teaching and which are an integral part of the community – both now and in the future. It also identifies the need for well designed, well built and well managed schools that support national and local priorities and inspire children, young people and communities.

The strategy recognises that school facilities need to be of high quality, be flexible so that they can meet future needs and be well maintained throughout their whole life.

Investment in new school facilities

Public Private Partnership (PPP) projects have delivered significant investment in new school facilities. Together with other investment through capital spending, prudential borrowing and developer contributions, this presents an outstanding opportunity to deliver high quality school facilities across much of Scotland's school estate, including indoor and outdoor facilities for PE and sport.

With regard to playing fields, PPP projects have resulted in many new floodlit Synthetic Grass Pitches (SGPs) and many more are planned. These high quality facilities can accommodate significant levels of use by both school and community.

In order to provide replacement schools at the same location, many education authorities have elected to build on existing school playing fields. To make some schemes affordable, some authorities have also disposed of school playing fields to generate capital receipts to invest in the project. In many cases such losses have been due to rationalisation of the school estate. Other losses have been offset by improvements to pitch quality.

Building on a school's current playing fields means they're unavailable during construction, but this should be compensated by the provision of new higher quality facilities. However, in a number of cases, school rebuilding projects have resulted in an unacceptable loss of playing field space and the 'shoe horning' of pitches into spaces which offer limited flexibility to provide a range of sports or to reduce wear and tear on

pitches. It is also evident that the opportunities to improve the quality of playing field facilities which PPP can provide have not always been realised. Not all new schools have been provided with synthetic grass pitches and there are even some examples of mineral surfaces being provided despite their unsuitability for modern use.

It is important that the management, charging and access arrangements of PPP schemes make proper provision for community access to school facilities during evenings, weekends and school holidays. Synthetic grass pitches in particular will often be in much demand and are ideally suited for community use.

The Scottish school grounds research project

As part of the *School Grounds in Scotland Research Project (2004)*, every school in Scotland was surveyed in order to determine current attitudes towards, and use of, school grounds. The general findings from the study confirm research carried out in the 1980s and more recently in England by *Learning through Landscapes* in 2003. The report states that "school grounds are an inexpensive yet versatile resource, which offer a unique setting to promote positive health and well-being, understanding of the environment, citizenship and physical activity for our school children." These findings confirm that school sites are made up of more than buildings and sports pitches. Although their wider use is recognised, 98% of those surveyed considered school grounds very useful or essential as a resource for sport and physical activity.

"...school facilities need to be of high quality, be flexible... and be well maintained throughout their whole life..."

In most schools, sports pitches make up a significant part of the school site and are important, not only for sport and physical education, but also for the contribution which they make to the wider aesthetics and operation of the school.

The National Audit of Scotland's Sports Facilities

Site surveys for the *National Audit of Scotland's Sports Facilities* were carried out in 2002 – 2003 to assess their general condition and identify the cost of first, bringing them up to an acceptable standard and second, maintaining them at such a standard for the next 25 years.

A total of 2,482 pitch sites were surveyed, 630 of which were at schools. These surveys revealed that 82% of natural grass and 84% of mineral winter sports pitches fell below desirable standards. The position was better in respect of multi-use games areas (MUGAs), largely as these are easier to maintain.

The audit concluded that many pitches and courts, particularly natural grass pitches, had inadequate construction specifications for the levels and types of use which they have had to support. In recent years, they had suffered from insufficient – and reducing – funding to allow proper maintenance. It was acknowledged that local authorities had faced, and continued to face, severe financial pressures, and that the maintenance of sports pitches in schools seemed to be a low spending priority for the majority of local authorities interviewed. However, the advent of PPP provides a mechanism for improvements in the construction and maintenance of pitches and courts.

"...management, charging and access arrangements of PPP schemes [should] make proper provision for community access to school facilities during evenings, weekends and school holidays."

In the view of the officers consulted, there are some excellent examples of quality sports pitch developments in schools funded by PPP and other means but there are also examples of recent provision which has been poorly planned and executed.

Such examples confirm that design and construction specifications must be formalised before PPP contracts are let to ensure that pitches are of a high enough quality for sustained school use.

School playing fields – site survey analysis

As part of the research for this publication, Tim Cruttenden Associates undertook detailed site surveys of 100 secondary, primary and special educational needs (SEN) schools. The majority of sites surveyed were chosen by local authorities as good examples of provision; only a few schools with problems were chosen. This bias in the sample must be considered when viewing the key findings.

The site surveys revealed that there are some excellent school playing field facilities in Scotland. However, the main perception is of outdated construction techniques, poor maintenance regimes and inadequate funding for routine and periodic maintenance. Although the primary schools study sample was more limited than for secondary schools, they appeared to suffer particularly from inadequate playing field provision.

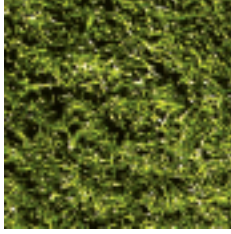
The main priorities for future spend in all types of school were identified as synthetic grass surfaces (full size in secondary schools and smaller in primary and SEN schools) and improvements to existing natural grass surfaces.

National planning policy

Government policy on planning for playing fields is set out in *National Planning Policy Guideline 11: Sport, Physical Recreation and Open Space (NPPG11)*.

NPPG11 states that all playing fields and sports pitches (including those at schools) are potentially significant for their sporting value unless proved by survey or strategic studies to be seriously lacking in quality or surplus to requirements, and that this potential is only fulfilled when they are properly maintained and managed. It states that disposal of school sites, even if no longer required for educational purposes, should only be entertained if open space analysis demonstrates that the land is surplus to requirements after taking into account both its recreational and amenity value. NPPG11 will be replaced by its successor, SPP11, in due course but the need to protect valued playing fields and to plan strategically to meet demands will remain.

NPPG11 affords a strong level of protection to playing fields in the planning system. Playing fields should not be redeveloped unless they are clearly shown to be surplus to requirements or replacement playing fields are provided with at least equivalent capacity, quality and accessibility.



sportscotland policy on the protection of playing fields

sportscotland has published a policy statement on the protection of playing fields, expanding upon the policy guidance in NPPG11. This document re-enforces the protection afforded by NPPG11 and sets out in more detail the criteria which must be met before redevelopment of a playing field may be considered acceptable.

sportscotland plays an important role in advising local authorities on the adequacy of playing field provision for new schools. We are consulted on all planning applications affecting playing fields and oppose the granting of permission for redevelopment unless there is clear evidence of no long term need for particular playing fields or unless adequate arrangements are in place for comparable replacement.

Planning Advice Note 65: Planning and open space

This document (PAN 65) sets out more detailed advice to local authorities on how to best plan for Open Space. In particular, it advises all local authorities to undertake an Open Space Audit and prepare an Open Space Strategy which makes provision for different types of open space, including playing fields.

Playing field strategies

sportscotland recommends that every local authority prepares a pitch strategy, setting out plans for long term improvement and development of facilities for pitch sports, and to help in assessing development proposals affecting playing fields. Strategies should look at current and likely future demand for all types of playing fields against the adequacy of the existing stock of playing fields to meet this demand. Such strategies should result in an Action Plan, linked to sports development objectives and containing targets and investment priorities.

The local authority's Education Department, and if relevant its PPP team, should be involved in the preparation of the strategy as school playing fields are an important element of an area's stock of sports pitches and their role should be considered within any strategy. This is particularly important for the planning of school SGPs as they require a significant capital investment and provide considerable capacity for community use.

Relevant trends in outdoor pitches and court sports

Technological advances have resulted in an increasing acceptance of synthetic grass surfaces for both practice and competition. Hockey was the first field sport to embrace new surfaces and it is generally accepted that, in time, artificial grass may be recognised as the only suitable surface for competitive hockey.

While the benefits of artificial grass are recognised for football practice, there has been a reluctance to accept the surface for competition, largely because of the disparities which existed between synthetic surfaces and natural grass. This position has changed as new surface types have been developed and the latest third generation artificial grass surfaces are now recognised as being suitable for training and competition at all levels of the sport.

Given the high levels of use which artificial grass surfaces are able to sustain, and their improved performance specification, it is probable that there will be increased levels of provision of artificial grass pitches for hockey and football, both as 'new build' and through the conversion of some natural grass and mineral based pitches. There has been a major growth in interest in junior small sided football which has led to increased demand for soccer sevens pitches in both schools and community recreation sites. The increase in girls' participation in football has also had implications for the provision of pitches and of suitable changing accommodation.

"...in time, artificial grass may be recognised as the only suitable surface for competitive hockey."

Delivery of physical education in schools is based on national curricular guidance produced by the Scottish Executive. A balanced programme requires the availability, ideally on site, of a range of indoor and outdoor sports facilities.

Section 2: Calculating provision

Interviews with school staff conducted during the production of this guidance reveal that, where appropriate and adequate playing fields are available, outdoor sport and physical activity typically occupies between 30% and 40% of PE curriculum time in primary and secondary schools.

In addition to curricular use, a school's playing fields will also have to accommodate extra curricular and Active Schools use, informal use by pupils at breaks and lunchtime and perhaps also matches and training by school sports teams and/or local community sports clubs. The wide range of potential uses of playing fields should be considered in assessing the number required for each school.

The type of sports pitches which school playing fields might be required to accommodate will depend upon the requirements of these curricular and extra-curricular programmes. In secondary schools, pitches for football, rugby and hockey will all be required, as will space for a seasonal grass athletics track and field events. In some schools, cricket, shinty or tennis facilities may also be required. Hard surface areas should also be provided for informal basketball and netball.

In addition to these pitch and court-based sports, school grounds can also be used for other outdoor activities such as cycling and orienteering. The above list of sports should not be considered exhaustive and a school's grass playing fields should ideally be provided as a single flexible area on which a wide range of activities can take place.

In primary schools, all of the above activities may take place, although typically in a much more informal manner than in secondary schools and using a smaller area of playing field.

Care has to be taken to ensure that use of natural grass pitches is managed properly. A well-constructed, well maintained grass pitch should be able to sustain approximately eight hours of school use per week. This is only a rough guide, and capacity might be much less in mid-winter and during periods of inclement weather. The ages of pupils can also impact on wear of natural grass surfaces – younger, lighter pupils cause less wear and damage than adults and older pupils. In order to use a pitch for eight hours a week, it must be of high quality. To achieve such high quality, an effective drainage system and maintenance regime must be in place.

There is a difference between a teaching space and a sports pitch: depending on the numbers and ages of pupils and the nature of the activity being taught, only half a pitch may be required, so it may often be possible for two classes to share the same pitch.

Secondary schools

sportscotland recommends that secondary schools each have one or more synthetic grass pitches (SGPs), supported by grass playing fields. To make a more thorough assessment of the playing field requirements of a secondary school, we've put together an example based on a school of 1,200 pupils.

The assumptions made in these worked examples will not necessarily be applicable in every case. They have been chosen to represent a realistic set of assumptions for a secondary school and are based on what **sport**scotland considers to be best practice, but each local authority should ultimately determine its own requirements. Designers must liaise with key school staff and consider other factors such as local climate, site conditions and local sporting priorities. Consultation with the wider community, such as local sports clubs and primary schools in the cluster, should also take place. Community demand for school pitches varies significantly around the country and is not therefore included in the example but this issue must be considered when calculating playing field provision and may often justify the provision of more pitches than are required for school use alone.

Assumptions

To put together a worked example of calculating school playing field provision, we needed to make a number of assumptions. These are listed and explained over the following pages. When calculating provision for your school or schools, you might wish to make different assumptions – whichever you choose, the list below should provide a useful framework of the factors to consider.

Assumption 1: Each pupil should take part in a minimum of two hours of PE each week.

The Physical Activity Taskforce, Ministerial PE Review Group and Sport 21 all recommend a minimum of two hours of core PE per week for every pupil.

Assumption 2: 85% of secondary school children should take part in extra-curricular activity.

For children of secondary school age, the Sport 21 target is to have 85% taking part in sport (in addition to PE lessons) more than once a week.

Assumption 3: Meeting the target above would require 45 minutes of access to playing fields per active pupil per week.

Experience of current extra-curricular activity in secondary schools suggests that, although differing from pupil to pupil and dependant on the sports undertaken, meeting this target would require access to playing fields for an average of 45 minutes per active pupil per week (some pupils having more use than this and some doing only indoor activity and therefore not using the playing fields at all). This covers all extra-curricular school activity, including use by school sports teams for matches and training.

Assumption 4: Lessons last for 40 minutes.

The worked example uses a lesson length of 40 minutes although this will not apply to all schools. Three 40 minute lessons per week are required to achieve the minimum recommended two hours of PE.

Assumption 5: There are 38 lessons available for the whole curriculum, including PE, in a school week.

Schools that have lesson lengths of 40 minutes can fit 40 lessons in a week. We've reduced this figure by two periods to allow for times when there will be no classes scheduled (to accommodate staff meetings, for example).

Assumption 6: 60 minutes of an 80 minute 'double-period' lesson is spent on a pitch.

Although lessons in our worked example last 40 minutes, it is assumed that all PE on playing fields will be taught in 80 minute 'double-period' lessons. To allow time for changing, only 60 minutes of such a lesson involves actual usage of the pitch.

Assumption 7: There are 20 pupils in a PE class.

This may vary depending on the year group and the qualification being studied for. In many schools, class sizes for those studying for certificate PE will tend to be lower than those for core PE. Whether or not the school considers PE to be a 'practical' subject is also important. Practical subjects typically have a maximum class size of 20, and non-practical subjects a maximum of up to 33. Many practitioners take the view that PE should be considered as a practical subject and that consequently the maximum class size for all groups should be 20. This approach has been used in our worked example. This parameter will have a significant impact on the results of the calculations and on assumptions of pitch capacity.

Assumption 8: The average group size for extra-curricular activity on playing fields is 25.

This is based on discussions with Active Schools Managers and Coordinators.

Assumption 9: Schools use playing fields for 40% of their PE lessons at certain times of the school year.

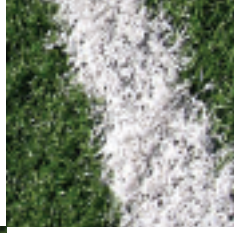
Previous design guidance for secondary school facilities assumed around 20% of PE activity took place outdoors. Research for this latest guidance suggests this was a significant under-estimate, with schools using their playing fields up to 40% of the time and in some cases more. The figure of 40% probably represents the maximum use of playing fields in the busiest spring and autumn seasons – but as we need to plan for maximum capacity, this is the figure used in the working example.

Assumption 10: Synthetic grass pitches are preferred for PE use.

Where there is a choice of both grass and synthetic pitches at a school, it is assumed that the ratio of PE use will be 2:1 in favour of the synthetic grass pitch.

Assumption 11: Extra-curricular use is split evenly between synthetic and grass pitches.

As extra-curricular use may involve the playing of matches, greater use will be made of the grass playing fields.



Assumption 12: A third of all curricular group activity needs a full pitch, the other two thirds needs only half a pitch.

Some PE outdoors will require a full pitch as a teaching space for a class group. Some lessons, such as more intensive skills practice, may need only half a pitch. And some – for example athletics, may need even more than one pitch. To reflect a balanced pattern of use for PE, it is assumed that one third of lessons on both grass and all weather pitches will need a full pitch and that two thirds will only need half a pitch.

Note: This is based on class sizes of 20: if class sizes are larger it is likely that a greater proportion of lessons would require a full pitch.

With 60 minutes pitch use for each double-period lesson (Assumption 6), the eight hours of weekly use of a grass pitch (Assumption 16) gives a total capacity of 12 double-period lessons per week (comprised of four 60 minute sessions on the whole pitch and eight 60 minute sessions using only half the pitch).

Assumption 13: Half of all extra-curricular group activity needs a full pitch, the other half needs only half a pitch.

Depending on the activity, how it is being played, how it is being taught, what space it needs and the age of the participants, the activity may only need half a pitch. This means that two activities, each using half a pitch, can take place at the same time and so increase the capacity of a pitch.

Note: In our worked example, if seven of the 10.5 hours available to extra-curricular activity (Assumption 14) had one group on a pitch and the remaining three and a half hours had two groups (or 2 x 3.5 – equal to seven hours), this effectively increases the capacity of a grass pitch to 14 ‘group hours’ for SGPs.

As grass pitches cannot sustain such heavy use (Assumption 16), the time available for extra-curricular activity, factoring in the full pitch/half pitch use, would be a little over 10 hours.

Assumption 14: There are 10.5 hours a week available for extra-curricular activity on school playing fields.

There is a limited amount of time available for extra-curricular activity, depending on the resources of a school to stay open outwith normal school hours and the most suitable times for pupils to remain at the school. For the purposes of this example, we’ve assumed 90 minutes after school each day and three hours on Saturday mornings, giving a total of 10.5 hours availability per week.

Assumption 15: The playing capacity of synthetic grass pitches is unlimited.

This assumes that it has been constructed to the recommended standards and is well maintained to keep to these standards.

Note: This means that, in our example, the SGP can accommodate 56 PE lessons per week: of the 38 lessons available (Assumption 5), 20 lessons with only one class using it, the other 18 shared between two classes (Assumption 13).

Assumption 16: The playing capacity of a grass pitch is eight hours a week.

Natural grass pitches can only accommodate a restricted amount of use whilst still maintaining adequate playing quality. A well constructed, well drained and well maintained grass pitch should be able to accommodate around eight hours per week of the varied type of use expected in a school. It should be noted that this is very much dependant on the pitch being of the requisite quality and receiving an appropriate level of routine maintenance. Pitches which do not meet such a standard cannot be expected to accommodate such high levels of use. The recent National Audit of Scotland's Sports Facilities has highlighted that a large majority of grass pitches at schools would need improvement works in order to accommodate such levels of use.

Assumption 17: 30% of S3-S4 pupils will study for a Standard Grade in PE.

This means that, in addition to 120 minutes of core PE, it has been assumed that these pupils will also study PE for an additional four periods (160 minutes).

Assumption 18: 20% of S5-S6 pupils will study for a National Qualification in PE.

This adds six periods (240 minutes) to their core allocation of 120 minutes of PE time.

Other areas to consider

School roll – now and in the future

The maximum number of pupils that the school is likely to have to accommodate in its lifetime should be considered in planning for school playing fields. Demographic trends and predicted future population levels in the school's catchment area should be considered, as should any likely changes to the popularity of the school, changes to its admissions policy, possible school closures or rationalisation and so on.

Informal use by pupils

Although informal use at breaks will have an impact on the condition and capacity of grass pitches (particularly as it tends to be centred on goalmouths, the most heavily used areas of a pitch) it is very difficult to quantify how much activity will take place and the subsequent impact on the pitch. Such usage is therefore not included in these calculations.

However, informal use and its impact remain important. The use of moveable goalposts may help reduce such impacts, as will access by pupils to an SGP and MUGAs at breaks and lunchtime.

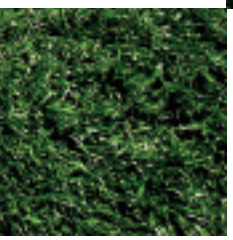


Figure 1: Summary of basic assumptions for secondary schools.

Factors	Worked example inputs	Based on
Lessons per week	38	Assumption 5
Lesson length	40 minutes	Assumption 4
Class size	20	Assumption 7
Minimum recommendation for physical education		
S1-S6	120 minutes per week	Assumption 1
Standard Grade	160 minutes (in addition to 120)	Assumption 17
National Qualification	240 minutes (in addition to 120)	Assumption 18
Playing field use		
PE playing field use	40% of all PE	Assumption 9
Pitch time per double-period	60 minutes	Assumption 6
Extra-curricular use	85% of pupils, 45 minutes per week	Assumptions 2 and 3
Extra-curricular group size	25 pupils	Assumption 8
Grass pitch capacity	8 hours per week	Assumption 16
PE SGP capacity	56 lessons per week	Assumption 15
Extra-curricular SGP capacity	14 group hours per week	Assumption 13
PE grass pitch capacity	24 lessons per week	Assumption 12
Extra-curricular grass pitch capacity	10 group hours per week	Assumption 13
SGP: Grass use (PE)	2:1	Assumption 10
SGP: Grass use (extra-curricular)	1:1	Assumption 11
Whole: Half pitch (PE)	1:2	Assumption 12
Whole: Half pitch (extra-curricular)	1:1	Assumption 13

Figure 2: Number of PE lessons per year/ study group.

Year group	Lessons	Based on
S1-S6	3	Assumption 1
Standard Grade S3-S4	4 (+3 core)	Assumption 17
National Qualification S5-S6	6 (+3 core)	Assumption 18

Figure 3: Number of pupils in each year of a school with a roll of 1,200 pupils.

Year group	Proportion of total roll	Number of pupils
S1	20%	240 pupils
S2	20%	240 pupils
S3	20%	240 pupils
S4	20%	240 pupils
S5	15%	180 pupils
S6	5%	60 pupils
Number involved in additional lessons (as a proportion of the totals above)		
SG S3	6%	72 pupils (of the 240 in S3)
SG S4	6%	72 pupils (of the 240 in S4)
NQ S5-S6	4%	48 pupils (of the 240 in S5/6)

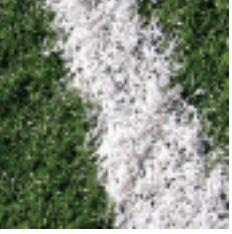


Figure 4: Calculating school playing field requirements for a secondary school of 1,200 pupils.

1. Curricular requirements		
Number of PE lessons required per week to deliver minimum of 2 hours for all pupils and Standard Grade/National Qualification.	230	This figure was worked out using the same method as the previous document in this series, *Design Guidance on Secondary Schools*.
Number of these that need to take place outdoors.	92	40% of PE lessons take place outside. 40% of 230 is 92.
Capacity of an SGP.	56 lessons a week	Capacity is limited only by time. See Assumption 15 for full explanation.
Number of lessons that need to take place on space other than an SGP.	36	2:1 ratio in favour of SGP (Assumption 10) applied to 92 periods = 62 periods, so SGP used up to its full capacity of 56 periods leaving 36 lessons to take place elsewhere.
Capacity of a grass pitch.	24 lessons	Assumption 12: 24 lessons i.e. 12 double periods
Number of grass pitches needed.	1.5	i.e. 36/24.
Summary of extra curricular requirements		
SGPs.	1	
Grass pitches.	1.5	This will be rounded up to a whole pitch in the final calculations.
2. Extra-curricular requirements		
Target of 85% of pupils to be active in addition to curricular PE.	1,020	The school has 1,200 pupils. 85% of this is 1,020.
Total active pupil hours per week on playing fields.	765	Each active pupil will spend an average of 45 minutes a week on playing fields. 1,020 x 45 minutes = 765.
Average group size for activity.	25	
Number of group hours per week.	31	This is the total number of hours – 765, divided by the number of pupils in each group – so 765/25 = 31.
Capacity of an SGP (for extra-curricular activity).	14 group hours per week	See Assumption 12 on previous pages to look at how this was worked out.
Number of group hours that need to be spent on space other than SGP.	17	1:1 ratio for grass: SGP applied to 31 hours equals 16 hours. Thus the SGP was used to its full capacity of 14 hours, leaving 17 hours to take place on grass.
Capacity of a grass pitch (for extra-curricular activity).	10 group hours per week	
Number of grass pitches needed.	1.7	i.e. 17/10.
Summary of extra curricular requirements		
SGPs.	1	
Grass pitches.	1.7	



Figure 4 continued

Total playing field requirements for a school of 1,200 – not including community use.		
SGPs	1	This is because the same pitch can be used for curricular and extra-curricular activity.
Grass pitches	4 (rounded up from 3.2)	This is a total figure (1.5 pitches for curricular use,1.7 for extra-curricular) as grass pitches cannot take the wear and tear of usage in the same way as synthetic grass pitches. This figure requires pitches to be well designed, constructed and maintained.

Using the same assumptions, these figures can be factored up or down to calculate provision for schools of different sizes, as shown in the table below.

Figure 5a: Secondary school playing field requirements based on the worked example (40 minute periods).

School roll	SGP	Grass pitch
400	1	1
500	1	2
600	1	2
700	1	2
800	1	2
900	1	2
1000	1	3
1100	1	3
1200	1	4
1300	1	4
1400	1	4
1500	1	5
1600	2	4
1800	2	5
2000	2	5

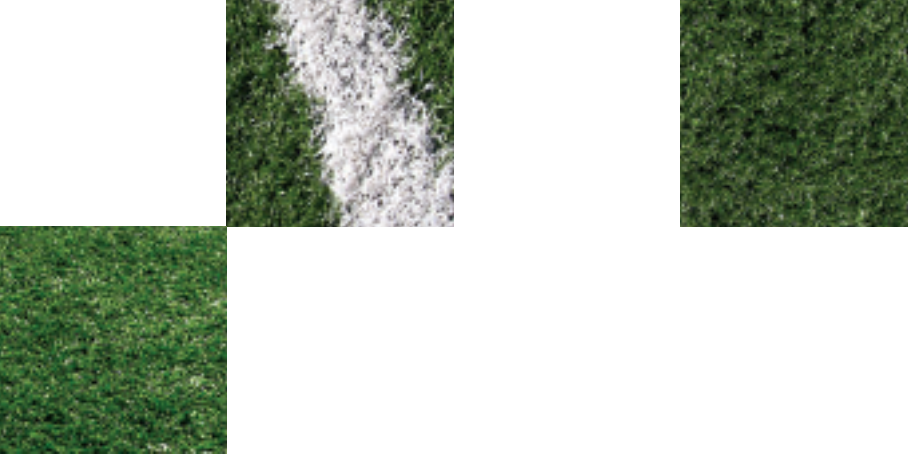
The results in the table left and in the previous worked example are based on the assumptions detailed at the beginning of this section. As previously mentioned, you may choose to assume differently on certain criteria, which may result in a different outcome for these calculations: these serve only as a guide.

Although in our worked example the minimum recommendation for PE is achieved by a core PE allocation of three 40 minute periods per week, this may be more difficult to achieve for schools operating with 55 minute lessons. One option would be to rota one period of PE per week with another subject so that PE would have either two or three periods on alternate weeks, giving an average in excess of the minimum target of two hours.

This situation perhaps represents the most likely way of meeting the target with period lengths of 55 minutes. Figure 5b shows the impact this would have on playing field requirements based on our worked example.

Figure 5b: Secondary school playing field requirements based on the worked example (55 minute periods).

School roll	SGP	Grass pitch
400	1	1
500	1	2
600	1	2
700	1	2
800	1	2
900	1	3
1000	1	3
1100	1	4
1200	1	4
1300	1	5
1400	1	5
1500	2	4
1600	2	4
1800	2	5
2000	2	5



Primary schools

The calculations for primary school playing field requirements can be simplified by considering only three basic sizes of school: those that have one class in each year group – single-stream; those that have two classes per year group – two-stream; and those that have three classes per year group – three-stream.

In many primary schools, outdoor PE can be limited or even non-existent due to an unwillingness to take pupils onto grass playing fields which can be wet or muddy. Whilst this is by no means a universal problem, and sometimes due to attitudes and practices rather than pitch quality, it is a significant constraint to participation in a large number of primary schools. **sport**scotland considers that a synthetic grass 'sevens' pitch is the optimum provision for primary schools and would address this problem for those schools whose grass playing fields are in poor condition or are perceived to be inappropriate. Synthetic grass will be particularly useful in delivering Active Schools programmes at primary schools as they provide a reliable, useable space at a time when indoor PE spaces are often required by after school care clubs. Whilst a synthetic grass sevens pitch is recommended, if none is provided then a grass sevens pitch will be required for each stream at a school, as illustrated by the following calculations.

Figure 6: Summary of basic assumptions for primary schools.

Factors	Worked example inputs
Class size	Standard school class
PE target	120 minutes per week
Playing field use	40% of all PE
Extra-curricular use of playing fields	80% of pupils, 1 hour per week (based on Sport 21, target 1)
Grass pitch capacity	8 hours
Informal pupil use	Not included

Figure 7: Worked example to calculate school playing field requirements for a single stream primary school.

1. Curricular activity		
No. of hours of PE per week required by each class.	2 hours	
No. of classes in a single stream school.	7	
No. of hours required for PE by the school.	14 hours	i.e. 2 hours x 7classes.
Proportion of PE taking place outdoors.	40%	
No. of hours spent on outdoor PE in a single stream school.	5.6 hours	i.e. 40% of 14.
Time out of one hour PE lesson spent on a pitch.	45 minutes	i.e. 75% of lesson time.
Actual use of playing fields in PE lessons for a single stream school.	4.2 hours	i.e. 75% of 5.6 = 4.2.
2. Extra-curricular activity		
Proportion of school children physically active for at least one hour a day on five or more days of the week.	80%	Target 1 of Sport 21.
Assumption of extra-curricular activity on playing fields per year group to contribute to this target.	1hour per pupil	As all pupils in the same class group are assumed to exercise together, this means one hour per class group.
Total number of school hours.	7 hours	1hour x seven class groups.
Figure for 80% of the pupils (as per Sport 21 Target 1).	5.6 hours	i.e. 80% of 7.
Summary		
Curricular requirement.	4.2 hours	
Extra-curricular requirement.	5.6 hours	
Total	9.8 hours	

Using the same principles for two and three stream schools, the results are as follows:

Factoring this up for two and three stream schools means	
One stream	9.8 hours
Two stream	19.6 hours
Three stream	29.4 hours

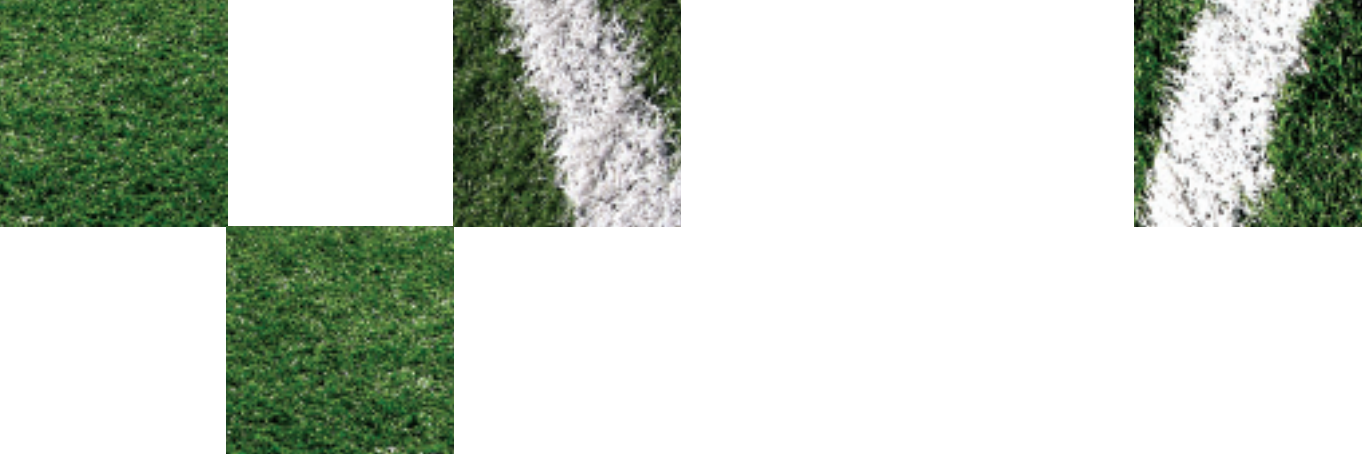


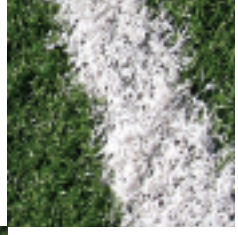
Figure 8: Calculating the number of playing fields needed to meet this demand.

Factor	Assumption	Based on
Grass pitch capacity	8 hours a week	Although pitches used for primary school provision are smaller, the demands placed on them by smaller children are less, so the same capacity as for the secondary school example can be used.
Grass pitch capacity (Group hours)	10 hours a week	This assumes that half the activity will only need half the pitch, giving a capacity of a little over 10 hours per week.
Synthetic grass capacity	Unlimited	As long as it is well maintained.

Based on the results of figures seven and eight, the pitch requirements for each school stream are therefore as follows:

School	Pitch type	Pitch requirements
Single stream	1 synthetic grass pitch (or 1 grass)	9.8 hours use per week.
Two stream	1 synthetic grass pitch (or 2 grass)	19.6 hours use per week.
Three stream	1 synthetic & 1 grass pitch (or 3 grass)	29.4 hours use per week.

It is preferable to have both synthetic and natural grass areas available within the school grounds to provide a range of surfaces for both formal and informal physical activity. For three stream primary schools which have a synthetic pitch, the additional grass sevens pitch is required to accommodate target levels of Active Schools use after school and at weekends. These should be supplemented by a hard surface games area for informal activity, play and social interaction at break times.



Statutory requirements

sportscotland considers that using the examples and calculations detailed in this document is the most accurate way of working out school pitch requirements.

However, school playing field provision is governed by the statutory instruments contained within *The School Premises (General Requirements and Standards) (Scotland) Regulations 1967* and *1973* (Regulations) and subsequent amendments. These Regulations require that, normally, every school should have available and in close proximity to it playing fields of not less than a given minimum area according to the number of pupils for which the school is designed. The specified space requirements are detailed in Figure 9.

The regulations are not, perhaps, the best guide to determining the appropriate playing field provision at a school. They are now rather dated and take no account of the growth of small-sided games (of particular relevance to primary school provision) nor to the development of SGPs. Nor do they preclude the provision of playing fields off the school site despite the disadvantages (in terms of cost, time and logistics) of transporting pupils. Finally, the Regulations offer no guidance on the type of pitches and other outdoor sports facilities which should be provided.

The Regulations do, however, remain current and local authorities must satisfy themselves that their provision complies in terms of the site area of the school, the total area of playing fields available and indeed the remainder of the provisions of the Regulations. It should be noted that the recommended provision in this guidance for both secondary and primary schools is, due to the inclusion of SGPs, often less than the minimum requirements set out in the Regulations.

Figure 9: Playing field requirements of School Premises Regulations.

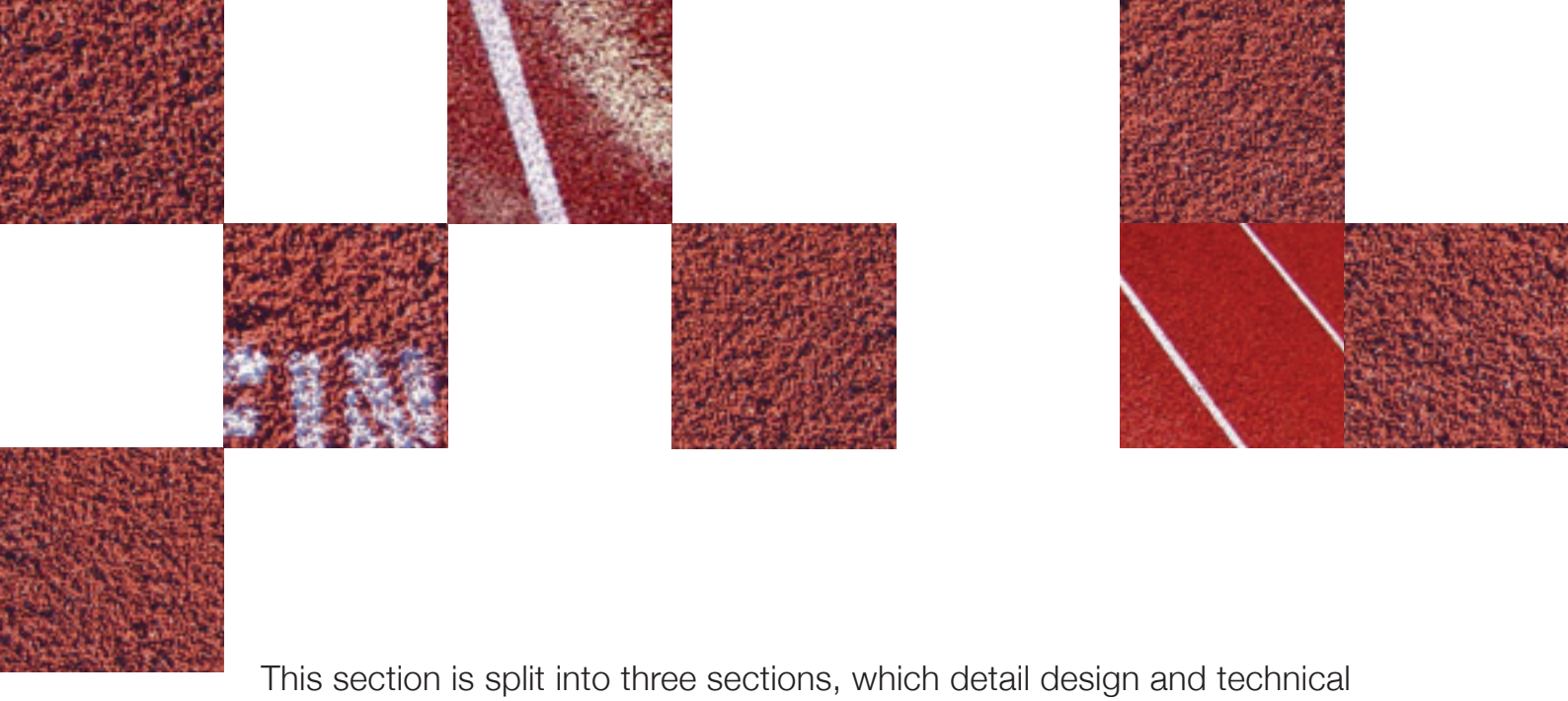
Primary Schools

Number of Pupils	Minimum area of playing fields (hectares)
60 or less pupils	0.1
61-140	0.2
141-315	0.3
316-450	0.4
451 or more	0.6

Secondary Schools

Number of Pupils	Minimum area of playing fields (hectares)
320-500	1.6
501-750	2.4
751-1000	3.2
Each additional 200 pupils over 1000	+0.4

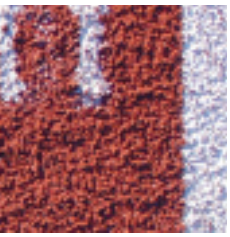
This part of the document is split into three sub-sections covering the planning of a site, design criteria and technical specifications and finally, maintenance. Together they cover the key aspects of design and maintenance of a school playing field.



This section is split into three sections, which detail design and technical specifications for all aspects of a playing field. The technical guidance that follows covers the following aspects:

1. Planning the site

This sub-section considers the type and size of playing fields to provide, and gives advice on the range of issues to consider when planning the layout of school playing fields. Model layouts for secondary school pitches are also provided.

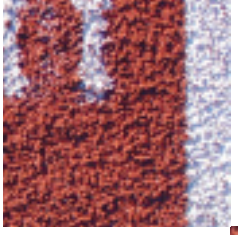


2. Design criteria and technical specifications

This sub-section runs through the different options available for sports pitch surfaces and provides technical advice on these and ancillary facilities.

3. Maintenance

Quality planning and construction are important first steps in creating suitable facilities. Maintaining them to the same high standard requires further commitment and investment. This section outlines the optimum maintenance regimes that should be in place to keep facilities in a sustainable, high quality condition.



1: Planning the site

Secondary Schools

Range of pitches needed

The pitches which a school site might need to accommodate will depend on curricular and extra-curricular programmes and community demand but could include the following.

Potential winter sports pitch requirements
Football Hockey Rugby
Hard surface areas and multi-courts might also be expected to accommodate:
Small sided football Small sided hockey Netball

Potential summer sports pitch requirements
Athletics Cricket Hockey† Rounders Shinty* Softball
Hard surface areas and multi-courts might also be expected to accommodate:
Basketball Tennis

†Although traditionally considered a winter sport, hockey is now played all year round.
*Shinty is now played over the summer with a winter closed season.

The suggested ideal for secondary school sites is one or more SGPs supported by natural grass playing fields. This arrangement should enable the higher capacity of a synthetic surface to be combined with the flexibility of a large area of natural grass playing fields. These should be augmented by multi-use games areas (MUGAs) and hard surface areas which may be used for both curricular purposes and as kickabouts during break times but which should not be considered as teaching spaces for the purposes of the calculations.

Managing restricted space

If a school site is short on space, a higher level of synthetic and hard surface area provision may be required, as may an increase in the number of indoor facilities. This option should not simply be used as a means of reducing the space requirements of a school: if a large enough site is available then it should be used. Extra-curricular programmes are organised in tight time bands immediately after school. Any reduction in the level of facilities provided in a school may restrict the number of activities, levels of use and numbers taking part.

Using off-site facilities

Even with enhanced all-weather and indoor facilities, in some very constrained sites it may still be impossible to make adequate provision and alternatives may have to be sought, such as use of dedicated off-site facilities and shared use of facilities. However, using off-school sites can reduce the time allocated to physical education (as more time is spent travelling) and, if the hire of transport is necessary, can have revenue cost implications which might be difficult for some schools to meet. Using off-site facilities should only be considered as a last resort although they can make a useful contribution by accommodating weekend matches by school teams.

Recommended size of sports pitches

There are several sources of published advice giving recommended sizes for school/youth sports pitches (from national governing bodies of sport and from previous Sports Council and Government design advice). Based on this advice and on recent consultations with the relevant bodies, **sport**scotland recommends that planning for school playing fields should be based around the pitch sizes detailed in the table below.

Figure 10: Optimum secondary school pitch sizes.

Pitch	Optimum age group	Pitch dimensions (m)	Minimum run-off areas (m) (l:w)	With run-off areas and lateral strip† (m)	Total area (m²)
SGP (Multi-Purpose)	All	100 x 60	3:3	106 x 66	6,996
SGP (Hockey)	All	91.4 x 55	5:4	101.4 x 63	6,388
Football Size 1	S4-6	100 x 60	6:4.5	112 x 78	8,736
Football Size 2	S1-3	90 x 45	6:4.5	102 x 63	6,426
Rugby Size 1	S4-6	113* x 60	3:4.5	119* x 78	9,282
Rugby Size 2	S1-3	97* x 50	3:4.5	103* x 68	7,004
Shinty	All	140 x 70	6:4.5	152 x 88	13,376

*Includes 9m goal areas for size 1 and 6m goal areas for size 2.
†A 9m strip to allow lateral movement of pitch to reduce wear. Not required for SGPs.
Shinty, cricket and athletics are discussed below.

Number of pitches needed at schools

Here are the key points to consider when assessing the number of pitches required at a school:

- Use the example outlined in Section Two of this document to help calculate how many sports fields are required per school.
- The choice of what pitches to provide should be based on the curricular and other requirements of the school but should be selected from the pitch types and guideline sizes in Figure 10.
- If only one football or rugby pitch is required, a Size 1 pitch should be provided. Although some schools may focus on particular sports and this is reflected in the choice of pitches, a range of pitch sports should be catered for as the curriculum can change over time (as can the nature of after school activity).

Applying the above principles, an average range of curricular and extra-curricular pitch sports would suggest the following pitch provision.

Figure 11: Optimum pitch provision for range of secondary school sizes.

Pitch requirement	Pitches to be provided	Min. area required (ha)
1 Grass	Football Size 1	0.9
2 Grass	Football Size 1 Rugby Size 1	1.8
3 Grass	Football Size 1 and 2 Rugby Size 1	2.5
4 Grass	Football Size 1 and 2 Rugby Size 1 and 2	3.2
1 SGP 1 Grass	SGP (Multi-Purpose) Rugby Size 1	1.7
1 SGP 2 Grass	SGP (Multi-Purpose) Football Size 1 Rugby Size 1	2.5
1 SGP 3 Grass	SGP (Multi-Purpose) Football Size 1 and 2 Rugby Size 1	3.2
1 SGP 4 Grass	SGP (Multi-Purpose) Football Size 1 and 2 Rugby Size 1 and 2	3.9
2 SGP 4 Grass	SGP (Football) SGP (Hockey) Football Size 1 and 2 Rugby Size 1 and 2	4.5

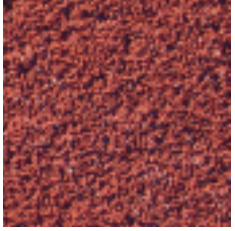
The above recommendations are based on a typical balance between pitch sports, with football the most popular activity and all hockey taking place on synthetic grass. Other factors to bear in mind are as follows:

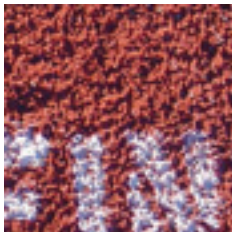
- For schools which concentrate more on hockey or rugby, changes to the mix of pitches (although not to the overall numbers) may be required. This is most likely to be applicable to schools concentrating on rugby, with one or more of the football pitches being replaced by rugby.
- If shinty is played, one or more of the grass football or rugby pitches should be replaced by a shinty pitch. When marking an U12 or U14 9-a-side pitch on a full-size pitch, centre it on the same spot with the goal line running through the penalty spot of the full-size pitch.
- Club hockey is almost wholly played on synthetic grass and only where a second SGP is provided is there a real opportunity to further increase hockey provision.
- For those schools with a strong hockey programme the SGP may be predominantly or even wholly for hockey use although it will in most cases still make sense to ensure that the SGP is suitable for a range of school activities.

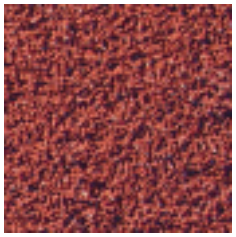
Minimum areas required for pitch provision

The minimum area required for each level of pitch provision is simply the total area taken up by the pitches, their safety margins and a 9m strip along one side to allow lateral movement of the pitch to reduce wear and tear at the most heavily used areas. Although there is some flexibility in pitch dimensions and the lateral strip (not in the safety margins), in many cases the shape and topography of the site will mean a larger area is needed to provide the required number of pitches.

In addition, multi-courts or hard-surfaced play areas will require further space. These facilities should not be considered as teaching spaces but can make an important contribution to informal physical activity by pupils, thereby reducing wear and tear on the grass pitches.







If cricket is played, the provision of a synthetic wicket or grass cricket square, perhaps inserted between winter sports pitches and using part of them as the outfield, will require yet further space although this option may restrict the flexibility of the playing fields, especially on smaller sites.

Siting of playing fields

The siting of playing fields is important and should be decided at an early stage in the planning of a school. There are a number of factors that should be taken into consideration as follows:

- Access
- Topography
- Gradients
- Orientation
- Flexibility
- Training areas
- Seasonal layouts
- Safety and convenience
- Other activities

Access

Many school pitches and courts are used by the community and there should be a clearly identified route from the school entrance or car park to both changing facilities and to the playing facilities themselves. The entrance and reception area will be the principal means of controlling the facility and the activities taking place. The relationship between this area and the main school entrance must be carefully planned to ensure that security and child protection issues are properly addressed.

There should be easy access from the physical education block/changing facilities to the outdoor pitches and courts. Where possible, this should be via an area of hard surface playground or properly surfaced paths. Routes to natural grass pitches should not cross other games areas, particularly SGPs and MUGAs, in order to avoid mud being deposited on them. For the same reason, access routes to SGPs and MUGAs should not involve crossing over natural grass areas.

All access routes should be designed with the requirements of disabled users in mind and should comply with the requirements of the Disability Discrimination Act. Planning of the school site should consider the possible need for emergency vehicle access and the access and storage requirements of maintenance plant and vehicles.

Topography

The topography of a playing field site is an important consideration. The larger and flatter the playing field, the more flexible it will be. Construction costs can be minimised if cut and fill is limited. In the interests of safety, banks with gradients greater than 1:3 should be avoided. Steep banks can also cause drainage problems for the land at their base and scouring of surfaces.

Gradients of grass playing surfaces

To aid surface drainage, a slight gradient across the direction of play is desirable. Gradients of 1:60 to 1:80 across the line of play will be suitable for winter games pitches and the cricket outfield. Pitches should be level along the line of play although a maxumum of 1:100 is acceptable if existing gradients are a constraint. Cricket squares should be level in the direction of play although a maximum gradient of 1:100 is acceptable as is a cross gradient of 1:60 to 1:80.

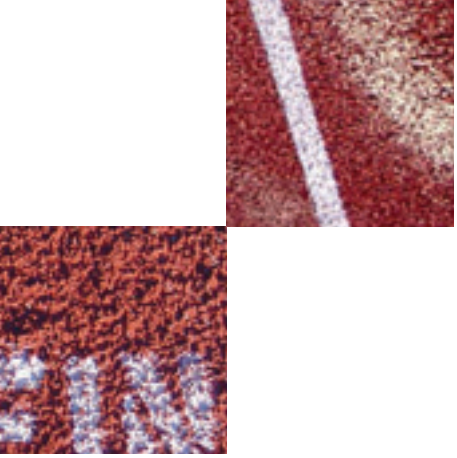
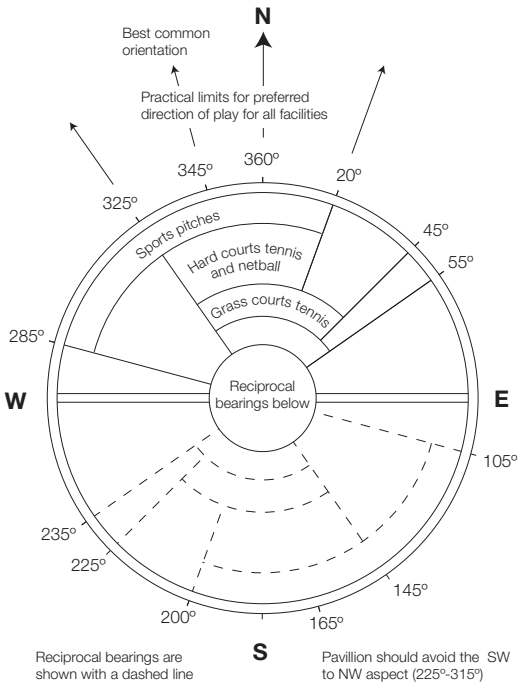


Figure 12: Pitch orientation in relation to aspect.



Source: National Playing Fields Association

Orientation

The alignment of pitches and courts in relation to the sun should be considered. Given the long hours of use which school playing fields might experience it is not possible to alleviate all problems of glare but proper orientation can help to minimise them. Problems are caused not only by the early morning and evening sun but also by the low angle of the winter sun throughout much of the day. A playing direction of broadly NNW to SSE is desirable for most games and will ensure that players will face the sun when it is at its highest and least troublesome.

In some circumstances, topography or the shape of a site might prevent the ideal pitch orientation being achieved. In such cases, cost issues or the need to provide a certain number of pitches may take precedence over achieving the ideal orientation in relation to the sun.

The National Playing Fields Association (NPFA) has provided useful guidance on pitch orientation.

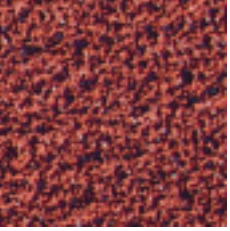
Flexibility

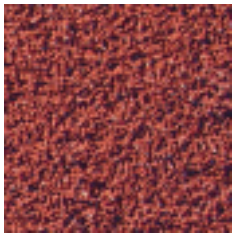
Given the many and diverse sports and activities which might need to be catered for; the need to provide for matches, practice and lesson sessions; the disparate age groups which might need to make use of the facilities and the high levels of use which school playing fields have to accommodate, it is essential that they are as flexible as possible. If care is not taken, artificial pitches and multi-courts can reduce the flexibility of small sites by making it difficult to alter the positions of pitches and preventing the layout of athletics and cricket facilities.

The greatest flexibility can be achieved by having a large, flat, well drained site which allows pitches to be moved laterally or re-orientated to reduce wear. A large flat area will also make it easier for an athletics track to be marked over winter sports pitches in summer months.

Training areas

The provision of practice or teaching areas as well as formal pitch facilities can help to reduce wear on natural grass pitches. If a school has an artificial grass surface or MUGA this will be able to accommodate skills practice and





coaching needs but natural grass areas may also be desirable. The surfaces in the skills practice areas for both football and hockey would need to be level and true for maximum benefit. Portable goals should be provided. Football goalkeeping and rugby tackling, line outs and scrummaging practice cause significant wear and tear of natural grass surfaces and it would be advantageous if dedicated practice areas are also provided.

Such skills practice areas might be located in 'dead' areas on the perimeter of playing field sites or between pitches. Sites with a dedicated cricket square are likely to have land between pitches which can be utilised for skills practice although care is needed in layout and programming of use to ensure that the cricket outfield remains in an acceptable condition.

Seasonal layouts

Summer and winter games facilities will normally share the same playing field area. Summer sports facilities such as a 400m athletics track, shinty pitch and cricket outfield have greater space demands than individual winter sports pitches and can best be accommodated on a large, flat area of grass.

Although sports have been identified as winter and summer activities, some may be played throughout the year, weather permitting. Furthermore, for younger pupils in particular, sports such as small-sided football and rugby, which might be considered to be winter sports, are increasingly played during the summer months. Shinty is now played from March to June and from August to November.

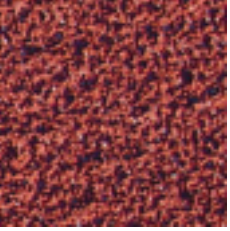
The extension of the season of some sports has made the multi-use of areas more difficult to achieve and it is important that activity spaces are laid out to ensure that conflicts between concurrent uses of adjacent pitches and seasonal uses of the same pitch are avoided. If a running track is laid out over winter sports pitches, care should be taken to ensure that where possible it (especially the home straight or sprints straight) avoids heavily worn areas like goalmouths and the centre circle.

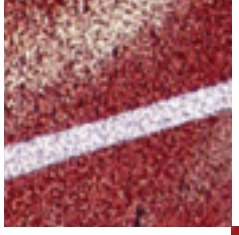
The location of any spectators for winter games must be carefully considered to avoid interference with adjacent activities or damage to playing surfaces. This can be a particular problem if pitches are located too close to cricket squares (which should be fenced off over the winter months).

The location of athletics field event facilities and cricket and golf practice nets should reflect the need for effective supervision and group teaching and should not hinder the layout or movement of winter sports pitches.

Safety and convenience

Care needs to be taken to ensure that school playing fields do not present hazards or inconvenience. Where possible, sharp gradients next to pitches and courts should be avoided, and constructed surfaces should not be undulating. Locating pitches close to boundary fences can be dangerous if balls can stray onto roads, footpaths and railway lines or into residential properties. Careful planning of the site can minimise risks but in some cases it might be necessary to install suitable fencing.





In some locations, playing fields might require robust boundary fencing to ensure the safety and security of users or the protection of facilities.

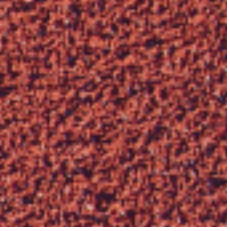
For safe play, pitch layouts should include adequate run-off margins around the playing areas, especially between adjacent pitches. Where pitches are to be located adjacent to roads, buildings or adjacent property, larger clearances may be required.

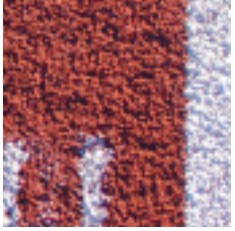
For safety reasons, and to minimise any possible damage to pitches, the position and orientation of shot, discuss, javelin and hammer throwing areas must be carefully chosen.

If any facility is to be floodlit, care needs to be taken to ensure that light spill does not cause a hazard or inconvenience to neighbouring properties. Issues such as noise, access and parking should also be considered in relation to any sensitive neighbouring properties, particularly if intensive community use is envisaged. Early discussion with the local planning authority may assist in identifying the most appropriate location for all-weather and floodlit facilities within the site.

Other activities

School playing fields also have the potential to offer other activities to those pupils who do not engage well with the traditional pitch sports. An area for cycle skills development should be provided, perhaps utilising those areas unsuitable for use as sports pitches. School grounds can also provide an excellent area for introductory orienteering and provision of a permanent marker course should be considered as teachers have limited time to set courses before lessons.





Primary schools

Playing field requirements in primary schools have changed a great deal in the past 20 to 30 years. A decline in the number of male primary school teachers meant a corresponding reduction in the level of primary school football, and curricular and other pressures have meant a decrease in other sports programmes. More recently, increased emphasis on healthy lifestyles has led to the introduction of a number of national and local measures intended to encourage primary school children to be more active. The growth in small-sided versions of pitch sports has significant implications for pitch requirements. Unfortunately, in many primary schools, the level and quality of provision for PE and sport has been poor and it has been difficult for schools to properly adopt and implement various national and local initiatives as a result.

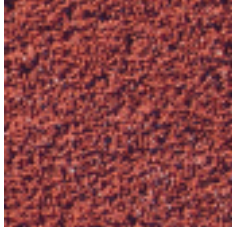
To meet both curricular and extra-curricular needs, a primary school site should have access to:

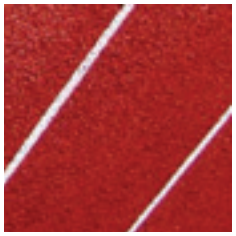
- hard surface areas for play, informal social purposes, assembly and physical education and sport;
- informal social areas;
- landscape and habitat areas; and
- playing fields.

Playing fields for primary schools are much smaller than those of secondary schools and are normally based on multi-purpose facilities. Much of both curricular and extra-curricular activity will be informal. Formal games will, for the most part, be small-sided or 'mini' versions of the sports played at secondary schools.

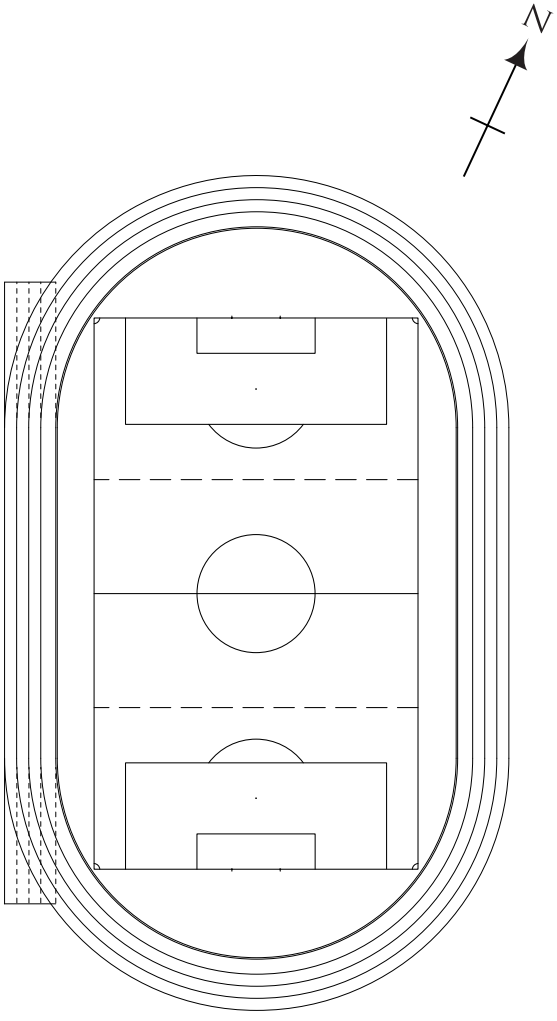
sportscotland's recommended unit of provision is a small multi-purpose SGP. A pitch of around 60m x 40m (plus safety margins of 2m on all sides) will be suitable for PE, small-sided sports and informal activity. If only grass playing fields are provided, a similarly sized pitch will be required for each stream at a school, with safety margins increased to 3m and the provision of a 6m wide lateral strip to allow the pitch to be moved to reduce wear and tear. Any such grass pitches must be well-constructed and well-maintained to accommodate the required levels of use – at present, most primary school grass pitches do not meet this quality threshold.

As with secondary schools, the School Premises

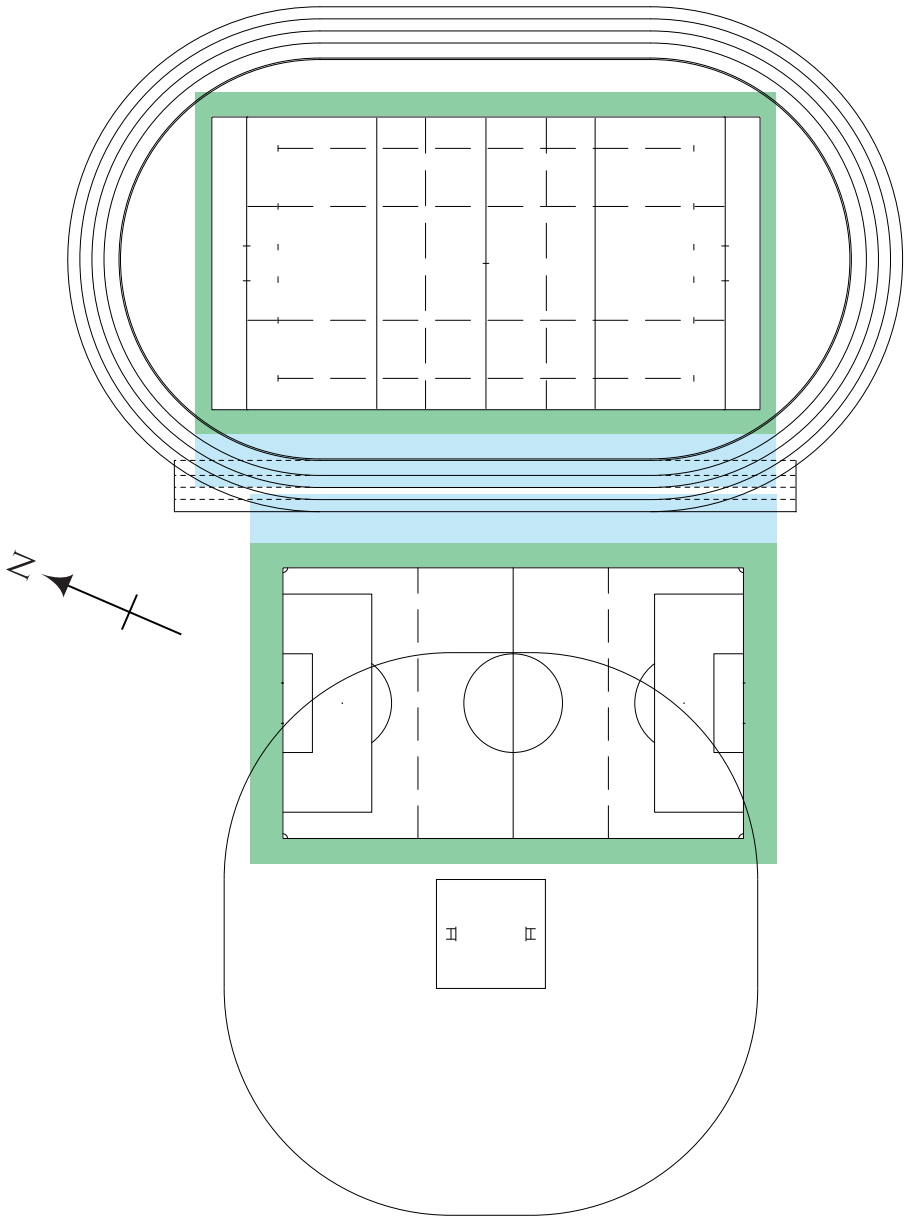




Indicative model layout 1: football size 1 and grass running track

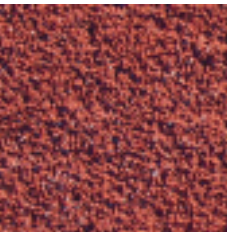
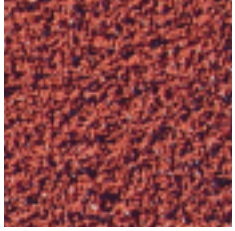


Indicative model layout 2: football size 1, rugby size 1, cricket square and grass running track

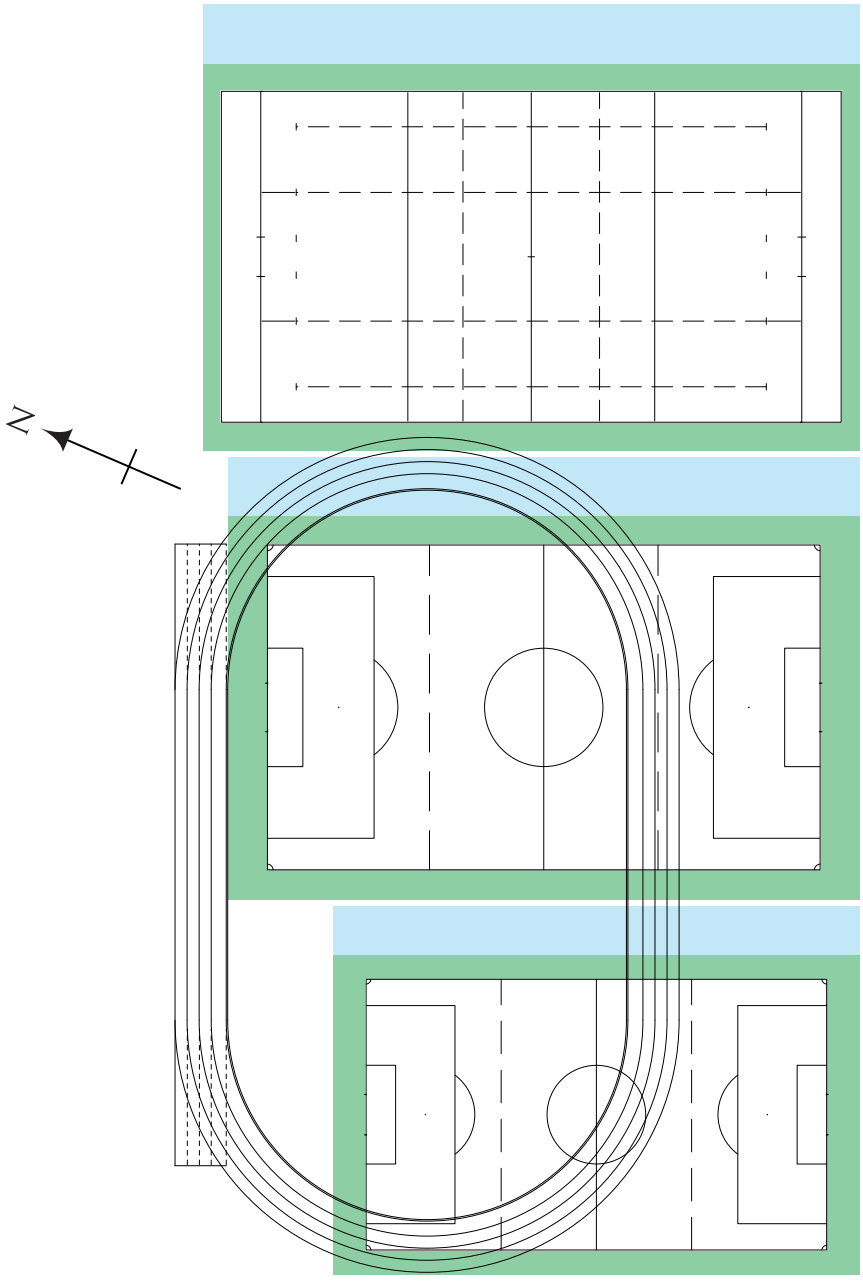


Key:

Safety margins


Indicative model layout 3: football sizes 1 and 2, rugby size 1 and grass running track



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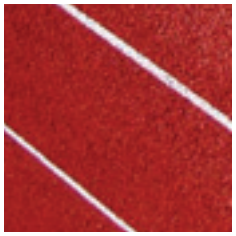
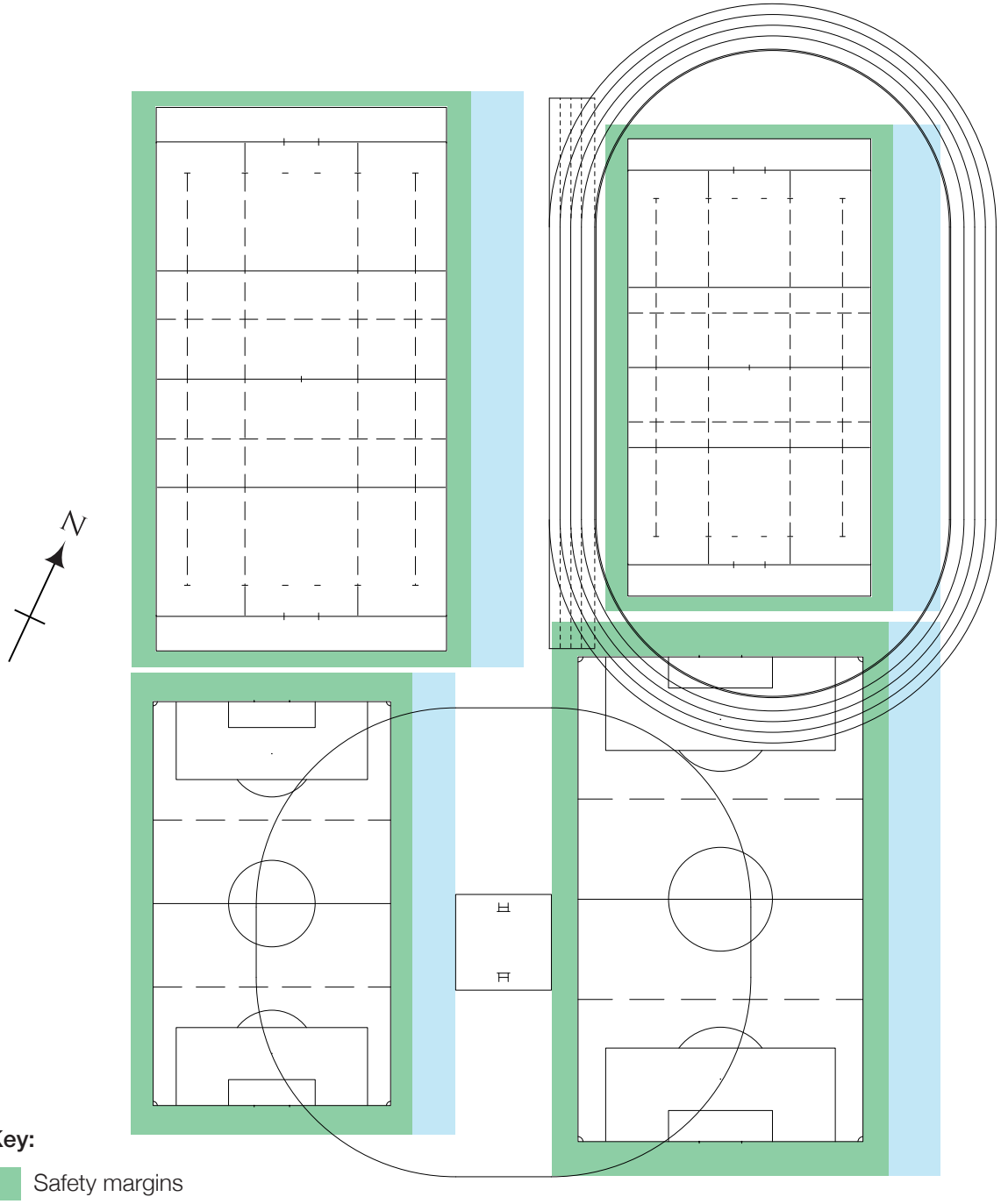


Indicative model layout 4: football and rugby sizes 1 and 2, cricket square and grass running track



2: Design criteria and technical specifications

sportscotland has recently completed the *National Audit of Scotland's Sports Facilities* aimed at identifying the condition of the nation's stock of facilities and the cost implications of bringing them up to an acceptable standard and maintaining them thereafter. This study established various grades for the different types of facilities studied and these have been used to set design criteria and technical specifications for school facilities.

Synthetic grass pitches

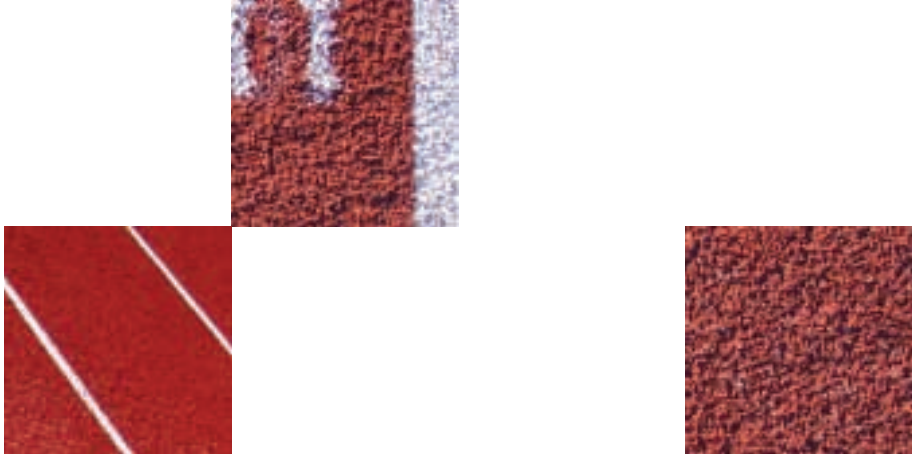
SGPs are those surfaces which provide an artificial alternative to natural grass for the playing of winter sports. They can be particularly useful in the school context as they are able to cope with much more intensive use, require less maintenance and are less affected by severe weather conditions than natural grass. They may be especially useful in situations where there is significant demand for use of a school's facilities by the community. A synthetic surface is capable of being used constantly throughout the school day, after school and by the community at evenings and weekends, though it should be recognised that high levels of use will increase routine, periodic and refurbishment maintenance requirements. Artificial grass cricket wickets are also effective in a school setting allowing a true and safe surface to be easily provided and maintained at comparatively little cost.

No single carpet type is suitable for all sports and, while they are very valuable facilities, over dependence upon SGPs can reduce and restrict the range of sports that can be taught. For example, not all surfaces are suitable for rugby skills practice and although some surfaces are suitable for shinty, the pitch dimensions required for a match are unlikely to be provided by an SGP.

Different sports require different playing characteristics and their respective governing bodies stipulate precise requirements. Choosing a priority sport may mean that certain playing characteristics are not ideal for – or even compatible with – other sports. Governing bodies of sport identify in their technical specifications performance requirements for surfaces in areas such as ball surface properties (such as roll and rebound characteristics) and player surface properties (such as traction and vertical deformation).

Most existing SGPs are multi-purpose facilities catering for as many sports as possible and tend to be a compromise between the main sporting uses of football and hockey. More recent technical developments have tried to create surfaces which more closely match the playing characteristics of natural grass and meet the performance requirements of different sports. Today there are a large number of artificial surfaces available, most of which look similar but may be made of different materials, manufactured by different techniques and designed for use in different ways. The most basic distinction has until recent years been between filled and non-filled artificial grass systems.

In filled systems, the pile of the artificial grass is filled to within about 3mm of the fibre tips with a fine granular material, such as silica sand. Play takes place on the composite bed of fibre and sand. Sand dressed systems are a development of the filled system – the carpet pile being denser



and shorter and with a reduced quantity of infill. This produces a slower surface and allows the boot or stick to get under the ball.

Non-filled surfaces consist of carpet alone and play takes place entirely on the fibre. The pile of the carpet has to be much denser per unit area to support the player and the stresses of play. This type of carpet is used almost entirely for hockey and the ball speed is regulated by watering the surface.

Third generation carpets more closely mimic the playing characteristics of good quality natural grass surfaces. The pile length is longer and more open and can be infilled with either a combination of sand and rubber granulate or solely rubber granulate, or have no infill at all.

The different types of system and their suitability for a range of sports can be characterised as follows:

Sand filled/dressed
Multi-purpose facilities able to cater for a variety of sports including football, hockey, basketball, netball, volleyball and even tennis.

Water based
High specification hockey surface.

Third generation (long pile)
High specification football surface but also rugby skills practice.

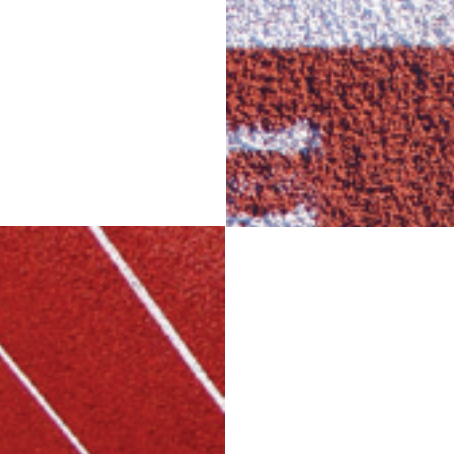
Third generation (short pile)
Primarily football but also rugby skills practice, hockey and shinty.

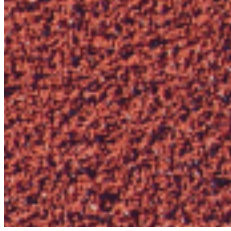
In most cases, schools with a single SGP will require a multi-purpose facility. If a second SGP is provided, a more specialist surface (typically for football) can be specified. In urban areas with more than one SGP (whether at schools or community playing fields), it may be possible to provide different surface types at each to best suit a range of sports. Ultimately, however, it is for local education authorities to determine the requirements for each school, taking into account curricular requirements, the most popular sports at the school, local community demand and the Council's sports pitches strategy.

A maximum cross-fall of 1:200 is acceptable but pitches should always be level from goal to goal. However, there is no reason why SGPs should not be laid level.

Fencing

SGPs must be enclosed for security and ball stop purposes. Fencing will also help to keep surfaces clean by preventing dog fouling and the accumulation of wind blown debris. Many early SGPs were bounded by light rolled mesh or chain link fences but these have been unable to withstand the rigours of use, are subject to deterioration behind goal areas and vulnerable to vandalism. It is recommended that artificial grass pitches be provided with higher quality fences. Goals for cross-field small sized games can be constructed within the fence system.





Floodlighting

In order to obtain the full benefits from the increased capacity of SGPs and Multi-use games areas, floodlighting for evening and winter play is essential. Six or eight columns are usually specified for a full-size pitch and these should not encroach into the safety run-off areas. The level of luminance will depend on the standard of play. 200-250 Lux should be suitable for most schools although 300-350 Lux would be better for hockey matches. Ideally the lighting system should be capable of providing different levels of illumination depending on the requirements of the pitch users.

Routine maintenance

The life expectancy of artificial grass sports facilities can be prolonged by proper routine maintenance and periodic rejuvenation and refurbishment works. If properly maintained, a third generation carpet should last for around seven years before needing to be replaced. All other carpet types should last for around ten years before replacement is required.

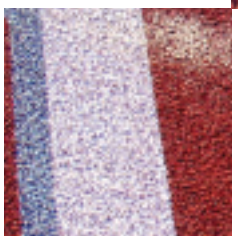
The last part of this section outlines maintenance programmes for the different types of facility identified in this guidance. It is important that maintenance is properly carried out if the facilities are to be kept in good condition for their whole life. Many site managers have the misconception that SGPs are maintenance free – but they are not. Failure to maintain any surface properly can greatly shorten its life and result in the need for more frequent capital reinvestment.

Changing and ancillary facilities

Changing facilities for school playing fields will usually be a part of the physical education block and should be designed specifically for outdoor activities. Those serving an SGP can also serve indoor spaces but, due to the likelihood of spreading mud and dirt to the indoor spaces, those serving grass pitches should not. With the increased emphasis on community use of school facilities, changing accommodation should be suitable for use by pupils and adults and should have clothes storage and security provisions which reflect these needs.

Two storage areas will be required to service outdoor pitches and courts. One area will be required for the storage of nets, posts, athletics equipment etc and possibly grounds maintenance equipment, although this may be brought to the site by the grounds maintenance operatives. The second area required is for the storage of equipment used in outdoor games and to which pupils might need to have access. The games equipment store should have a workbench for basic maintenance and be sufficient in size to allow the wide range of equipment needed to support the curriculum to be stored out of season.

More detailed advice on changing accommodation is provided in **sport**scotland's '*Secondary School Sports Facilities: Designing for School and Community Use*', available to download from www.sportscotland.org.uk



Natural grass pitches

sportscotland's *National Audit of Scotland's Sports Facilities* identified five grades of natural grass pitch. The Grade 3 model was identified as suitable for school use and as the base standard to which most local authority, further education and club pitches should be constructed. It is essential that an appropriate maintenance regime is put in place ensuring that such a pitch maintains its playing quality and capacity. At present, a large majority of school pitches do not meet this quality threshold.

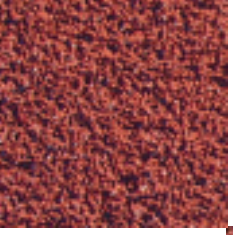
Grade 3 pitches are deemed to have been constructed with a well structured sandy loam topsoil over an uncompacted subsoil and have an efficient piped drainage system at no greater than eight metre centres with a clean gravel backfill into which a system of sand/gravel slits connects from the surface. The topsoil can be amended by ameliorating the top 50mm or so with an approved medium grade sand. However it should be noted that not all top soils are suitable for such amelioration as the combination of materials can sometimes lead to the creation of an impermeable surface. Site managers undertaking new constructions or reconstructions should prepare a full design specification. This should take into account all of the variables which might exist on a site, including soil type and the appropriateness and need for amelioration.

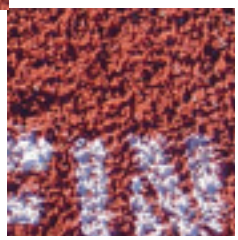
Grade 3 pitches generally perform satisfactorily as long as the slits remain surface connected. For this reason, sand topdressing is important in keeping the integrity of the slits and the surface intact and needs to be carried out as part of planned periodic maintenance. While the performance standards of a Grade 3 pitch are likely to be acceptable for longer if maintenance is sufficiently intensive, problems associated with loss of grass cover and loss of levels, particularly in goal mouths, can still occur. Such problems are caused by overplay and inadequate remedial maintenance and it is imperative that renovation works are carried out periodically and as required. For those schools without access to an SGP, grass hockey pitches must be well-constructed and well-maintained, with grass ideally cut to 15mm.

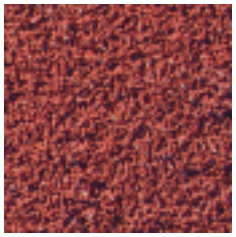
It should be noted that a higher specification of construction or drainage may be needed for sites which have poor drainage characteristics or where particularly high standard or intensive use is anticipated.

Multi-use games areas

Multi-use games areas (MUGAs) are small sized areas used primarily for playing and practicing sport. They will normally be enclosed with a ball stop fence or ball rebound wall. Playing surfaces might be tar macadam, porous concrete, polymeric or artificial grass. MUGAs can provide a cost effective resource for schools and have a wide range of sporting uses. However, it is this range of use which requires facilities to be multi-purpose and this in turn leads to a need for compromise, particularly in terms of dimensions and the playing characteristics of the surface. MUGAs should be floodlit with goals incorporated into the fencing system.







Five different types of facility can be identified:

Type 1
Open textured porous macadam areas used for ball rebound sports where tennis is the priority and sports such as mini-tennis, netball and basketball are secondary users.

Type 2
Open textured porous macadam areas used for ball rebound sports where netball is the priority and sports such as tennis, mini-tennis and basketball are secondary users.

Type 3
Polymeric surfaced areas used for ball rebound sports where netball is the priority and sports such as tennis, mini-tennis and basketball are secondary users.

Type 4
Polymeric surfaced areas used for five-a-side football, basketball and general sports and recreational training and play. Due to their greater shock absorbency and lower surface friction these areas are not recommended for tennis or netball.

Type 5
Synthetic turf areas are used for sports such as modified hockey and five-a-side football.

Figure 13 gives further guidance on the suitability of the range of surface types for different sports.

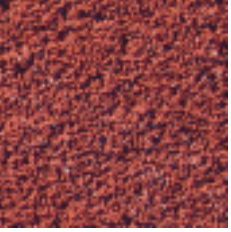
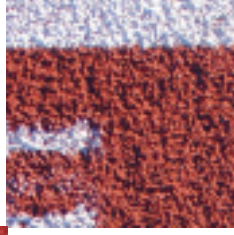
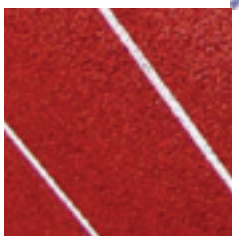




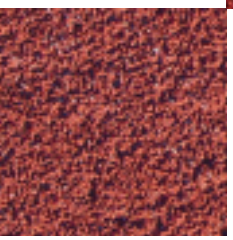
Figure 13: Multi-use games areas (MUGAs) – suitability of surface types for different sports.

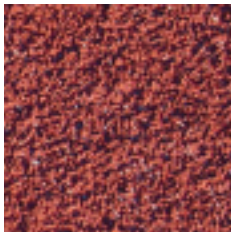
Sports Surface/ MUGA Type	5-a-side Football	Tennis	Mini Tennis	Netball	Basketball	Modified Hockey	Rugby Training	Athletics Training	Football Training
Macadam (Type 1)	4	1	1	2	1	4	4	4	4
Macadam (Type 2)	4	2	2	1	2	4	4	4	4
Polymeric (Type 3)	3	2	2	1	2	3	4	3	3
Polymeric (Type 4)	2	3	3	3	2	3	3	1	2
Sand filled synthetic turf (Type 5a)	1	2	2	3	3	1	2	3 (excluding spikes)	1
Sand dressed synthetic turf (Type 5b)	2	2	2	3	3	1	3	3 (excluding spikes)	2
Needle-punch synthetic turf (Type 5c)	3	3	3	3	3	2	4	3 (excluding spikes)	3

Key 1 = Preferred surface
2 = Suitable surface
3 = Possible surface though less suitable
4 = Unsuitable surface

The table identifies the general suitability of the main types of playing surface for a range of sports, although this will also depend on the standard of play that is intended. **Please note that these descriptions are provided as a general guide only** and are not necessarily indicative of the views or requirements of individual national governing bodies of sport.

Further guidance on each surface type is given overleaf and in the source document referenced below.





Macadam surfaces

Macadam surfaces may take the form of *dense* or *porous* macadam. Whilst the former may provide a more durable surface and is typically laid on school playgrounds, its inability to drain is a major constraint on sports use. For this reason porous macadam is considered more suitable and can be played on in most weather conditions year round.

Porous macadam courts may be colour coated to improve aesthetics and the playing environment. This is achieved by either using pigmented materials to form the macadam or by painting the un-pigmented surface after installation. Although the cost of pigmented macadam may be initially higher, the increased durability of the colour may make it more suitable for areas of high use.

Polymeric surfaces

Polymeric surfaces have a degree of inherent shock absorption, which may be varied by increasing the thickness of the surfacing layer or altering the composition of the polymeric materials. To provide the high degree of slip resistance required by sports such as tennis and netball a specially modified final coating can be applied, although the use of this surface for ball contact sports will cause a rapid reduction in its slip resistance. For this reason, combining sports such as five-a-side football and netball is not recommended.

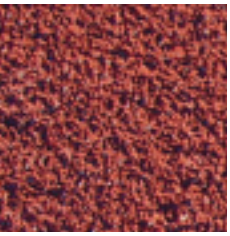
Thicker forms of the surface may be specified where the intended sports include five-a-side football or athletics training. This type of polymeric surface is also capable of taking a running shoe spike.

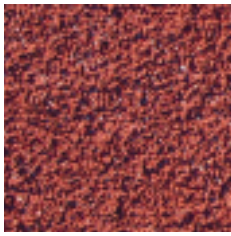
Artificial grass surfaces

As explained in the section on SGPs, there are many different types of synthetic turf construction with a range of properties and advantages and disadvantages. Variables include the polymer used for the fibre yarn, the cross-sectional area of the individual ribbons of fibre, the method of carpet manufacture, the pile height and pile density. Two principal designs are offered for MUGAs – those with a vertical pile of tufted, woven or knitted construction that is supported with a sand filling or dressing and those with an interlocking pile of needle-punch construction that are also filled or dressed with sand.

The majority of synthetic turf pitches are surfaced with tufted sand filled carpets. Experience has shown this form of carpet to have good durability and performance for MUGAs. Sand-dressed carpets are a more recent innovation. They have a shorter, denser pile than the standard filled systems with a reduced quantity of sand fill and are primarily suited for MUGAs where hockey is the primary sport. Needle-punched carpets offer benefits of increased sand stability within the pile and higher drainage characteristics.

Synthetic grass surfaces often have a shockpad which is a resilient layer introduced between the base and the playing surface. This is used to provide a degree of comfort to players and to create the required playing characteristics for specific sports. The most common components are rubber crumb/shred mixed with a resin binder although there are other types which have been developed to suit particular performance characteristics. The type and thickness of shock pad chosen will be dictated by the priority sport.





Refurbishment

The requirements for ongoing major expenditure will depend upon the type of surface provided. Macadam facilities should have a life span in excess of 25 years but artificial grass and polymeric surfaces will need to be rejuvenated and refurbished at regular intervals.

Polymeric courts also have periodic maintenance requirements. A newly laid surface should give firm foothold and good medium-paced ball speed. As the surface is used over the years, however, it will become smoother and more polished and this may result in increased ball speed and some impairment of the foothold when the surface is damp. When this happens it will be time for the surface to be re-coated/retextured. Re-texturing will normally need to be carried out every four years and can only usually be carried out on three occasions before the surface water infiltration rates are reduced below an acceptable standard. Once this stage has been reached, around year 16, the old surface must be drilled and a new surface laid.

Cricket squares

The prime requirement for cricket is a suitable cricket table which, for economy of land use, is usually combined with winter sports pitches. Grass hockey pitches have historically tended to provide the best outfield for cricket given the better quality of grass and truer surface usually to be found in these facilities. The switch to SGPs for hockey, however, means grass hockey pitches are becoming less common. Football pitches can also provide suitable outfields for cricket but rugby pitches, because of the considerable disturbance to the pitch surface which can result from normal play, cannot usually provide a sufficiently fast, true and safe surface.

Formal cricket wickets are constructed using techniques which differ greatly from most other natural grass facilities. The performance aim of a cricket wicket is for a regular surface which will have the capability to allow a ball to rebound from its surface without absorbing too much of the downward force applied by the bowler. Consequently, the surface must allow for a regular bounce and should be true to line and level to avoid dangerous conditions. Providing the desired playing characteristics and a natural grass surface which is capable of draining and sustaining grass growth is very difficult to achieve.

A new, modern wicket would ideally be constructed as follows:

- excavating the area of the wicket (generally 825 square metres or thereabouts);
- creating a construction profile which would include a drainage system below a gravel raft;
- placing a depth of free draining sand loam over the gravel raft; and finally,
- adding a depth of carefully selected clay loam which would be consolidated and seeded.

Once the construction has become established, the wicket is prepared for play by watering, close cutting and rolling to produce a very firm level surface.

Natural grass cricket wickets require regular, routine maintenance to maintain playing quality and restore grass cover and surface levels following play. Over time and due to the routine maintenance programme implemented, more intensive periodic remedial works may be required. This may involve operations such as:

- specialist aeration;
- removal of the upper soil profile/turf and replacement with fresh clay loam and reseeding; and
- total reconstruction.

Because of the high levels of wear which cricket wickets can experience, artificial wickets are often laid alongside or within the natural grass cricket table to facilitate play in adverse weather conditions and for practice purposes. In many schools an artificial wicket may be the only form of match play facility.

Artificial grass wickets will eventually wear out and need to be replaced. It is assumed that the life of a well-used artificial grass wicket is about eight years although many are made to last considerably longer. Every four years the ends of the wickets should be repaired. Cricket practice nets are often provided on the outfield boundaries of cricket areas but they could be located in any suitable area of a school site.

3: Maintenance requirements

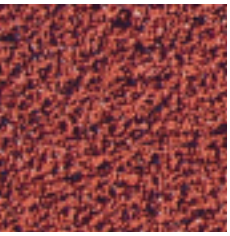
Planning for playing fields does not end with their installation. To enjoy them as a resource and to ensure that their use can be sustained for schools and the wider community, regular and thorough maintenance is required. This section outlines best practice in maintenance for the most commonly used playing surfaces in schools.

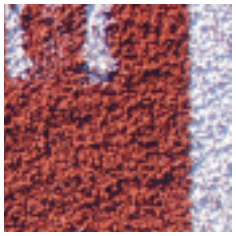
Natural grass pitches

To keep a Grade Three natural grass pitch up to a good standard, these are the recommended steps to take – and the frequencies at which they should be undertaken.

Figure 14: Suggested maintenance for a natural grass pitch.

Action	**Frequency** (no of times a year unless otherwise specified)
Grass cutting	30
Scarify	1
Drag brush	1
Herbicide	1
Fertilizer	4
Pesticide	1
Outfield spike	13
Top dress	1
Verti drain	4
Overseed	1
Measure and mark	2
Overmark	3 per week for 36 weeks
Pre match inspection	2 per week for 22 weeks 3 per week for 14 weeks
Post match inspection	2 per week for 22 weeks 3 per week for 14 weeks
De-litter	3 per week



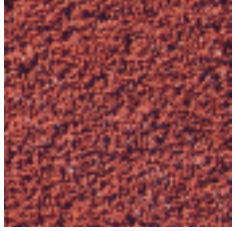


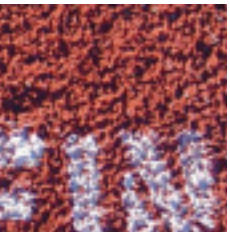
Synthetic grass pitches

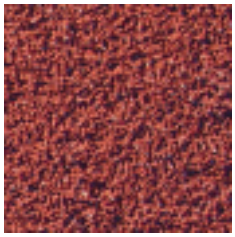
Specific maintenance requirements will vary according to pitch type and manufacturers instructions. An indicative outline schedule is provided below:

Figure 15: Suggested maintenance for an SGP.

Action	Frequency
Check fixtures and fittings	Daily
Make sure gates are shut	Daily
Clear leaves and rubbish from the area	Weekly
Deal with any new weeds, moss or algae	Weekly
Brush the surface of the pitch to redistribute sand	Weekly
Check infill levels	Monthly
Outside the fence, check and clear mowing strips and check cleanliness of access paths	Monthly
Check the irrigation system if installed	Monthly
Check lighting	Monthly
Check thoroughly for moss and algae growth, food stains etc, and remedy as appropriate	Periodically (at least every six months)
Check seams, inlaid lines etc, and report any failures to the installer	Periodically (at least every six months)
Power grooming • Sweep the pitch surface with rotating brush • Remove debris and leaves • Remove fine contaminates and dusts from the surface	Quarterly
Moss and weed treatment • Apply regulation dosages of an approved moss and weed killer to a 3m band on the pitch perimeter. Apply in accordance with manufacturer's instructions and current Health and Safety Legislation. The application will generally be carried out using tractor mounted applicators • Dependent on the severity of infestation more than one application may be required • Also dependent on the severity of infestation, the treated area may be restricted to the perimeter margin or a full application across the total playing surface may be required	Every 6 months
Contra brushing • Penetrate the top 2–3 mm of sand infill • Break up the formed crust of contaminant and compacted silica sand • Drag brush the surface to provide even coverage	Annual







Multi-use games areas and tennis courts

The routine maintenance requirements for MUGAs and tennis courts will vary according to the type of surface finish. Indicative outline maintenance schedules are provided below.

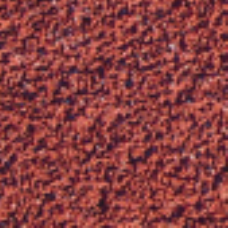
Bitmac and porous concrete facilities

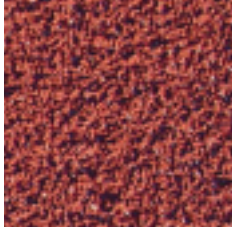
Bitmac facilities are hard wearing and require relatively little maintenance. The main requirements are to keep the area free from debris, prevent moss and algae forming and ensure that the interstices of the surface do not become clogged thus impairing drainage.

While porous concrete courts are hard wearing and need very little maintenance, it is critical that the required maintenance actions are carried out if the court is to remain free draining. It is important that vegetation and debris are removed from the court otherwise the free drainage of the structure will be impaired. A typical maintenance schedule for both these surfaces is suggested opposite.

Figure 16: Suggested maintenance for Bitmac and porous concrete facilities.

Action	Frequency
Check facility, fixtures and fittings	Daily
Remove litter and debris as required	Daily
Clear leaves and rubbish from the court	Weekly
Deal with any moss or algae	Monthly
Check lighting	Monthly
Wash the court	Annually
Apply moss-killer	Annually
Re-paint lines as required	Annually





Polymeric surfaced facilities

Polymeric surfaces are comparatively easy to maintain, keeping the surface clean being the only routine maintenance that the court surface should require.

Figure 17: Suggested maintenance for polymeric surfaced facilities.

Action	Frequency
Check facility, fixtures and fittings	Daily
Remove litter and debris as required	Daily
Remove dust, leaves, rubbish and other detritus from the surface	Weekly
Wash the surface, removing stains with a mild detergent and soft brush	Monthly
Check lighting	Monthly
Check the court surface carefully. Call in the installer if there is any cause for concern or if it is suspected that the surface needs re-coating	Annually

Synthetic grass surfaced facilities

Maintenance of artificial grass courts is particularly important. Neglecting the recommended schedule could have serious long-term consequences even if, in the shorter term, the court does not appear to suffer. Maintenance need not be time-consuming or onerous, but its benefits are profound. To omit the recommended processes may result in a court ceasing to drain at half-life or sooner. A typical routine maintenance schedule is shown opposite.

Figure 18: Suggested maintenance for synthetic grass surfaced facilities.

Action	Frequency
Check facility, fixtures and fittings	Daily
Remove litter and debris as required	Daily
Clear leaves and rubbish from the court	Weekly
Deal with any new weeds, moss or algae	Weekly
Brush the surface to redistribute in-fill	Weekly
Move sand which accumulates in corners etc and redistribute	Monthly
Check sand levels	Monthly
Check lighting	Monthly
Check for moss and algae growth etc and remedy as appropriate	Every six months (at least)
Groom with a rotary brush/vacuum	Every six months (at least)
Treat court with moss-killer/ algaecide. Call in the installer if any aspect is causing significant concern	Annually

Note: These are minimum recommendations. Cleaning, grooming and court inspection can always be done more frequently.

Polymeric track and field facilities

By their nature, polymeric surfaces are extremely durable, being designed to satisfy arduous performance test criteria whilst withstanding constant spike use in varying climates. However, there is no such thing as a 'maintenance-free' sports surface, and all polymeric track surfaces will require a modest degree of maintenance. This basic maintenance is of vital importance if the surface is to remain consistent in performance, safe for the athlete to run and jump on and long lasting. Indeed, the installer's guarantee will usually be conditional on the recommended maintenance requirements being carried out with reasonable diligence. Maintenance procedures are designed to ensure that:

- the synthetic track and field event surfaces are kept scrupulously clean;
- the surfaces are safe for all standards of user;
- in the case of a porous system, the free drainage of surface water is maintained throughout the life of the track; and
- the facility looks attractive and well-kept at all times.

These objectives are achieved by:

- sweeping leaves and other detritus from the surface;
- washing the surface to remove contaminants such as grime, algae, moss, sand, etc;
- applying prophylactic treatments of moss-killer and/or algaecide; and
- periodically removing weed growth from the perimeter kerb lines.

Leaves, tree flowers, pine needles and other detritus should not be allowed to remain on the surface for any length of time. If this does happen, they rapidly rot down, forming a contaminating 'skin' on the surface and providing a growing medium for algae and moss. A mechanical leaf-sweeper or vacuum cleaner is ideal for removing vegetation and other rubbish. Restricted areas may have to be undertaken by hand. At least once a year, it is advisable to wash the surface using high-pressure jetting apparatus.

At all track venues, maintenance machinery will require regular access to the central grassed area. It is good practice to provide protection for the track surface at regular pedestrian crossing points, e.g. from the dressing room on to a central pitch. This protection could take the form of rollout matting to ensure that mud from football boots does not contaminate the track surface. It is wise to provide plywood or similar sheeting to allow access to the central area for grass cutting machines, etc.

Figure 19: Suggested maintenance for polymeric track and field facilities.

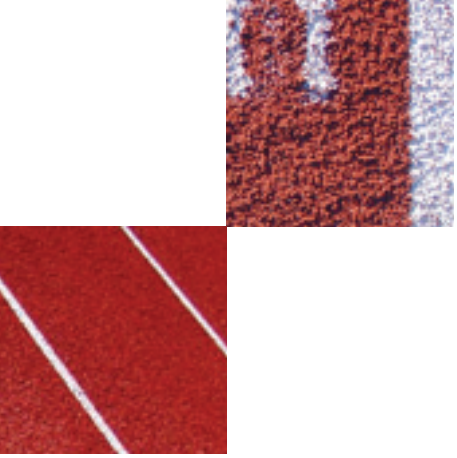
Action	Frequency
Check facility, fixtures and fittings	Daily
Remove litter and debris as required	Daily
Remove dust, leaves, rubbish and other detritus from the surface	Weekly
Wash surface with a mild detergent and soft brush if it has become stained	Monthly
Power wash the polymeric surfaces	Annually
Treat with fungicide and algaecide as necessary	Annually
Check the surfaces carefully. Call in the installer if there is any cause for concern or if it is suspected that the surface needs re-coating	Annually

Cricket squares

The routine maintenance of a natural grass cricket square is designed to create a true, fast, even bounce surface suitable for the playing of cricket. Necessary actions are outlined in the table opposite.

Figure 20: Suggested maintenance for cricket wickets.

Action	Frequency
Setting up wickets for play	Weekly
Repairing wickets after play – scarify, top dress and over seed	After use as required
Grass cutting by hand on the square maintaining the height at 6mm over the square through the season and effectively 'shaving' the surface of the wicket due to be played	Allow cutting 3 times per week April till end of September in total 80 cuts pa.
Rolling the square and additional rolling of wicket being prepared for play	3 times per week from April till end of September
Aeration, scarifying, solid tining, top dressing and over seeding etc	Start and end of season maintenance
Chemical treatments	6 applications of fertilisers, application of selective herbicide and fungicide as required
Cutting outfield	60 cuts per year
Aeration through tining	4 time a year



Artificial grass wickets and practice facilities are less labour intensive than natural grass wickets and require comparatively little maintenance. Care needs to be taken to ensure that detritus and decomposable materials are not allowed to build up on the synthetic surface and that fungicide and algaecide is applied regularly. During the off season it might be necessary to lift the carpet and level the sand base to ensure that a true surface continues to be provided.

Floodlighting

Floodlighting needs to be routinely maintained in order to meet performance requirements effectively over its working life. Maintenance actions should include routine work on the electrical services, cleaning of fittings and adjustment of aiming angles. When performance falls below the specified level or when individual lamps fail, all lamps should ideally be replaced as a complete set and not as individual units.

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Acknowledgements

Tim Cruttenden Associates, who led this project for **sport**scotland.

Professional Sportsturf Design (PSD) Ltd
Culmor Design
Redpath Design
PMR Leisure
Sports Turf Research Institute
National Playing Fields Association
Grounds for Learning
Convention of Scottish Local Authorities
Scottish Health Promoting Schools Unit
Scottish Local Authority Network of Physical Education
Scottish Football Association
Scottish Schools Football Association
The Camanachd Association
Scottish Athletics
Scottish Hockey Union
Learning and Teaching Scotland
The Scottish Council for Research in Education
The Educational Institute of Scotland
Raymond O'Donnell, South Ayrshire Council
David Maiden, Fife Council
Viv Inglis and Craig Corr, Renfrewshire Council
Ian Pye, East Renfrewshire Council

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Published by **sport**scotland

ISBN: 978 1 85060 497 6
SPFPDG 1106 0.25M