Guide to indoor and outdoor areas for small sided football, mini-soccer and futsal

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Contents

Sand filled artificial grass & needle-punch carpets

Long pile artificial football grass

Indoor sports hall floors

Section 5 – Fencing

Section 6 – Goals

Whilst every effort has been made to ensure the accuracy of the information contained in this publication any party who makes use of any part of this guide in the development of an area for small sided football, mini-soccer or futsal shall indemnify the Football Association, its servants, consultants or agents against all claims, proceedings, actions, damages, costs, expenses and any other liabilities for loss or damage to any property, or injury or death to any person that may be made against or incurred by the Football Association arising out of or in connection with such use.

References are made in this guide to British Standard BS 7044: Artificial Sports Surfaces. The European Standards Committee CEN TC 217 is currently preparing common European Standards for Artificial Sports Surfaces and once the European Standards are published they will replace BS 7044. The FA will amend these guidance notes at that time.

Introduction

Over 4 million people play small-sided football each year in England of which 1.2 million play on a regular league or cup basis. This level of participation makes small sided football one of the largest sports in the country. Small sided football is generally used to describe any game played by less than eleven players. However, there are a number of formats that have gained greater recognition and formality than others and this guide concentrates on identifying the facility requirements for the following games:

- Five and six-a-side football
- Seven-a-side football
- Futsal
- Mini-soccer

For further details on the FA's Small Sided Football Development Programme, including the relevant 'Laws of the Game', please consult the FA's web site at www.thefa.com/Grassroots/SmallSidedFootball.

This guide has been prepared to aid facility designers and operators providing facilities for the various forms of small sided football. They detail the sizes of pitches, the types of surfaces that are commonly used and the facility infra-structure required to ensure the pitch provides a satisfactory playing environment.

There are many ways of designing, constructing and surfacing small sided football pitches. These guidelines do not constitute any form of preference or approval from the FA but are intended to provide information to potential consumers to allow them to make informed choices when designing facilities.

In many cases a pitch has to cater for more than one sport. The design considerations for multi-use games areas (MUGA) on which small sided football is to be played are also discussed.

Section 1 - Five, Six and Seven-a-side football

Five-a-side, six-a-side and seven-a-side football may be played indoors or outdoors. The pitch may be enclosed by rebound boards (barriers), fences or walls or the game can be played to goal lines and touchlines on open spaces.

Five, six and seven-a-side football is played on a range of surfaces that include:

Outdoors

- Natural grass
- Long pile artificial football grass
- Sand filled artificial grass
- Sand filled needle punch surfaces
- Polymeric surfaces
- Macadam

Indoors

- A range of indoor sports hall floorings including timber, composites, vinyl and linoleum sheet materials, textiles and carpets
- Long pile artificial football grass
- Sand filled artificial grass
- Polymeric surfaces

Guidance on the main types of artificial surfaces is given in Section 5.

Pitch dimensions

The layout of the pitch for five, six or seven-a-side football is shown in Figure 1. It must be rectangular and the length of the touchline must be greater than the length of the goal line. Where possible the ratio of length to width should be 2:1. The recommended pitch dimensions are shown in Table 1.

If a pitch is surrounded by fences, walls, etc and is marked with goal lines and touchlines, adequate run-offs need to be provided to ensure players do not injure themselves by running into the surround structures. The run-offs should be surfaced with the same surface as the playing area.

Where the pitch is located on an open area (e.g. a grass playing field) run-offs should also be provided so that spectators, team officials, etc do not stray too close to the pitch. This can be done by marking additional lines or using portable cones to designate the outer boundaries of the run-offs.

The minimum and recommended sizes for run-offs are also shown in Table 1. The recommended run-off should be used where possible.

Table 1
Dimensions of five, six and seven-a-side football pitches

Five and six-a-side pitches				
	Length		**Width**	
Min.	25.0m		16.5m	
Max.	50.0m		35.0m	
Run-off when applicable	Minimum	2.0m	Minimum	2.0m
	Recommended	3.0m	Recommended	3.0m

Seven-a-side pitches				
	Length		**Width**	
Min.	50.0m		30.0m	
Max.	60.0m		40.0m	
Run-off when applicable	Minimum	2.0m	Minimum	2.0m
	Recommended	3.0m	Recommended	3.0m

Pitch markings

The pitch is marked with lines that should be 8cm wide. Lines should preferably be coloured white or yellow outdoors and white, yellow or red (in multi-use sports halls) indoors.

The two long boundaries are called touchlines; the two shorter lines are called goal lines. Where barriers or walls are used to enclose the pitch and form the boundaries of the playing area it is not necessary to mark the touchlines or goal lines.

The pitch is divided into two halves by the halfway line. The centre mark is positioned at the mid point of the halfway line. A circle with a radius of 3.0m (diameter 6.0m) is marked around it (irrespective of the pitch size).

The penalty area for each goal is formed by a semi-circle of radius 6m (irrespective of the pitch size) measured from the midpoint of the goal line. The

extremities of the semi-circles should reach the goal line, barrier or wall regardless of whether or not the goal posts encroach into the playing area. The penalty mark should be 6m from the mid point between the goal posts and equidistant from them.

Pitches that are not enclosed by barriers of walls (and have run-offs) should have corner arcs marked. These are quarter circles of radius 25cm from each corner of the pitch drawn inside the pitch.

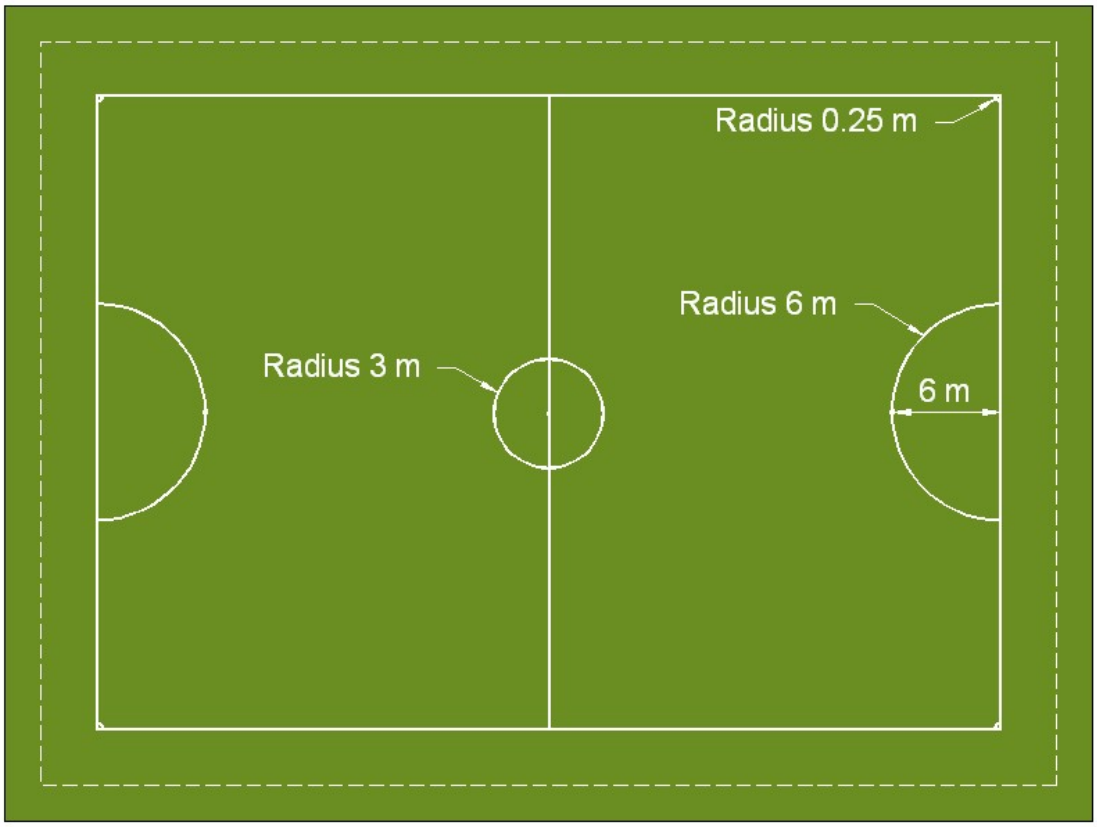

Figure 1 Markings for five, six and seven-a-side football
(dotted line shows boundary of run-off where pitch is not enclosed)

Goals

The recommend sizes of goals are 3.66m wide by 1.83m high, the same as used for mini-soccer. Indoors, where a ceiling height is low, 4.88m wide by 1.22m goals are often used by senior players and either 3.66m wide by 1.22m high or 2.44m wide by 1.22m by junior players.

Rebound boards, barriers and walls

Five, six and seven-a-side football pitches are normally enclosed. On indoor pitches the walls of the building are often used to form some or all of the boundaries. Walls must be impact resistant and smooth and finishes should

prevent flaking or dusting. There must be no protrusions (structural columns, beams, etc) extending from the walls into the pitch i.e. the face of the wall should follow a straight line. Doors should be avoided, but where no other option exists they must only open outwards.

Where rebound boards (permanent or portable) are used these should be at least 1.2m high. The use of suspended nets above the boards is also common to ensure balls remain within the area of the pitch and do not interfere with activities on adjacent areas.

Indoor Lighting

Sport England recommend that in sports halls where small sided soccer is played the lighting system be designed to achieve the performance detailed in Table 2.

The three classes shown refer to the levels of play. Class 1 refers to top level competition such as international and national matches, Class 2 refers to regional and or club competitions and Class 3 refers to general training and recreational/school competitions.

Dedicated small sided football halls should normally be designed to satisfy either Class 2 or 3.

Table 2
Floodlighting for five, six and seven-a-side football (indoors – multi-sport halls)

Property	**Requirement**		
	Class 1	**Class 2**	**Class 3**
Maintained average luminance	750	500	300
Uniformity (Min/Ave)	0.7	0.7	0.7

As most indoor facilities are also used for more than one sport it is important the lighting requirements of the other sports are taken into account. If badminton, table tennis or fencing is to also take place in the sports hall the lighting should either be Class 1 or 2.

Note: The ceiling height of indoor sports/football halls should be at least 6.1m high.

Outdoor Lighting

If an outdoor pitch is to be lit the lighting system should be designed to achieve the performance detailed in Table 3.

Table 3
Floodlighting for five, six and seven-a-side football (outdoors)

Property	**Requirement**
Maintained average luminance	> 120 Lux
Uniformity (Min/Ave)	>0.6
Glare rating	$\leq$ 50
Lamp colour temperature	Tk > 4000 K
Lamp colour rendering	$\geq$ 65

To minimise the running costs the lighting system may be designed to provide a lower level of lighting for recreational play and training etc. This should be no lower than a maintained average luminance of 75 lux.

Section 2 - Mini-soccer

Mini-soccer is normally played outdoors. Traditionally the game has been played on natural grass but the increasing number of artificial grass pitches has led to a number of Leagues allowing the use of these alternative forms of surface, particularly where inclement weather makes natural grass pitches unusable. Section 5 describes some of the commonly used artificial surfaces and the FA's *Guide to Artificial Grass Pitches for Community Use* (available on www.thefa.com) provides comprehensive guidance on long pile artificial grass football surfaces.

Pitch dimensions

The layout of a Mini-soccer pitch is shown in Figure 2.

Where pitches are located within enclosed areas run-offs should be provided to ensure players do not injure themselves by running into surrounding fencing, hoardings, spectators and other obstacles. The run-offs should be surfaced with the same surface as the playing area. Where the pitch is sited on an open area (e.g. a grass playing field) run-offs should also be marked so that spectators, team officials, etc do not stray too close to the pitch. This can be done by marking additional lines or using portable cones to designate the outer boundaries of the run-offs.

Table 4
Mini-soccer pitch dimensions

Under 10s / 9s		
	Length	**Width**
Min.	45.75m	27.45m
Max.	54.90m	36.60m
Run-off	3.0m	3.0m
Overall size		
Min.	51.75m	33.45m
Max.	60.90m	42.60m
Under 8s / 7s		
	Length	**Width**
Min.	27.45m	18.30m
Max.	45.75m	27.45m
Run-off	3.0m	3.0m
Overall size		
Min.	33.45m	24.30m
Max.	51.75m	33.45m

Pitch markings

The pitch is marked with lines that should be 10cm wide and preferably white or yellow in colour. The pitch is divided into two halves by the halfway line. The centre mark is positioned at the mid point of the halfway line. The penalty area for each goal is formed by a rectangle measuring 9.15m by 16.47m wide.

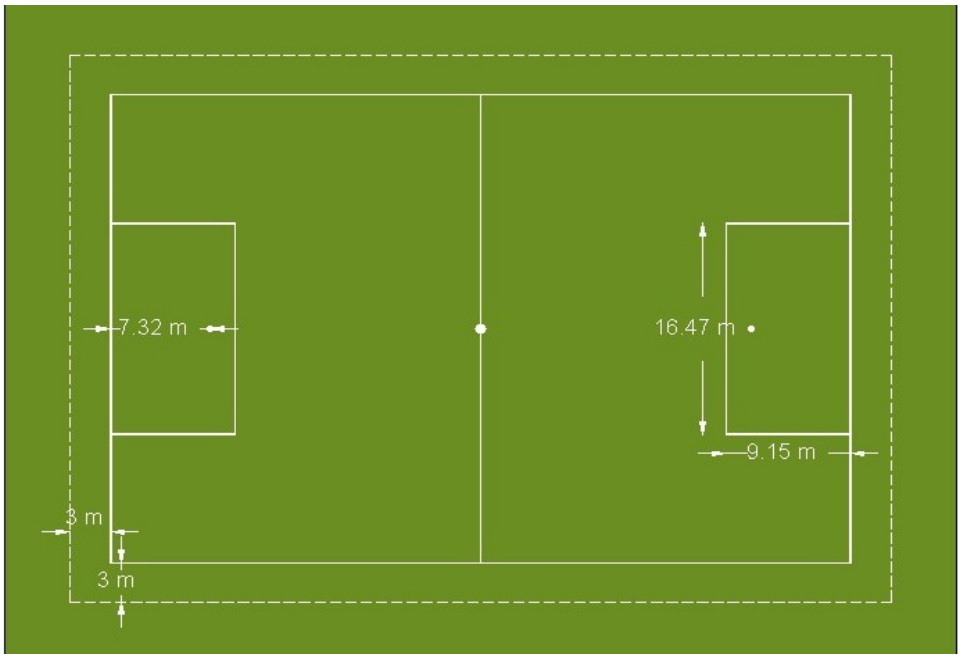

Figure 2 Markings for Mini-soccer

Goals

Goals should measure 3.66m wide by 1.88m high.

Outdoor Lighting

If an outdoor pitch is to be lit the lighting system should be designed to achieve the performance detailed in Table 5.

To minimise the running costs the lighting system may be designed to provide a lower level of lighting for recreational play and training etc. This should be no lower than a maintained average luminance of 75 lux.

Table 5 Floodlighting for Mini-soccer (outdoors)	
Property	**Requirement**
Maintained average luminance	> 120 Lux
Uniformity (Min/Ave)	>0.6
Glare rating	≤ 50
Lamp colour temperature	Tk > 4000 K
Lamp colour rendering	≥ 65

Section 3 - Futsal

Futsal is a format of small sided football that is played extensively throughout the world and as a consequence is recognized and supported by UEFA and FIFA. The game is relatively new to England and the FA is supporting its further growth as its preferred format of small sided football. Futsal is a fast, exciting game that assists with the development of core skills and enshrines Fair Play. Differences and similarities between Futsal and traditional five a side formats are identified below.

Futsal	**Traditional five-a-side football**
Five players on court – rolling substitutions	Five players on court – limited substitutions
Played to lines. Ball is returned to play with a 'Kick In'	No By-lines or End-lines – use of rebound boards. Ball constantly in play.
Use of wider and longer pitch	
All players allowed to enter penalty areas	Only goalkeepers permitted to enter penalty areas
No height restriction on ball	Use of restrictions on height of ball
Use of square goals (3m x 2m)	Use of rectangular goals
Use of Futsal ball (size 4, 30% reduced bounce)	Use of football – size 5 for adults
Five foul limit – No wall for direct free kick after fifth foul	Unlimited fouls

Further information on the FA's small sided football programme can be found at www.thefa.com/Grassroots/SmallSidedFootball.

Futsal may be played indoors or outdoors on a range of surfaces that include:

Outdoors

- Artificial grass – all types
- Sand filled needle punch surfaces
- Polymeric surfaces
- Macadam

Indoors

- A range of indoor sports hall floorings including timber, composites, vinyl and linoleum sheet materials, textiles and carpets
- Long pile artificial football grass
- Sand filled artificial grass
- Polymeric surfaces

Guidance on the main types of surface is given in Section 5.

Pitch dimensions

The layout of a futsal pitch is shown in Figure 3.

The game is played to goal lines and touchlines on open spaces without barriers.

If a pitch is surrounded by fences, walls, etc adequate run-offs need to be provided to ensure players do not injure themselves by running into the surround

structures. The run-offs should be surfaced with the same surface as the playing area.

Where the pitch is located on an open area (e.g. a grass playing field) run-offs should also be provided so that spectators, team officials, etc do not stray too close to the pitch. This can be done by marking additional lines or using portable cones to designate the outer boundaries of the run-offs.

The minimum and recommended sizes for run-offs are also shown in Table 6. The recommended run-off should be used where possible.

Table 6
Futsal pitch dimensions – non international matches

	Length		**Width**	
Min.	25.0m		15.0m	
Max.	42.0m		25.0m	
Run-off enclosed pitches	Minimum	2.0m	Minimum	2.0m
	Recommended	3.0m	Recommended	3.0m
Run-off open space pitches (min)	2.0m		2.0m	

Futsal pitch dimensions - international matches

	Length		**Width**	
Min.	38.0m		18.0m	
Max.	42.0m		22.0m	
Run-off enclosed pitches	Minimum	2.0m	Minimum	2.0m
	Recommended	3.0m	Recommended	3.0m
Run-off open space pitches (min)	3.0m		3.0m	

Pitch markings

The pitch is marked with lines, which should be 8cm wide and preferably white or yellow in colour.

The two long boundaries are called touchlines; the two shorter lines are called goal lines. The pitch is divided into two halves by the halfway line. The centre mark is positioned at the mid point of the halfway line. A circle with a radius of 3.0m (diameter 6.0m) is marked around it (irrespective of the pitch size).

The penalty area for each goal is defined as a quarter circle with a radius of 6m centred on the outside of each goal post. The quarter circles are drawn from the goal line to meet imaginary lines drawn at right angles to the goal line from the outside of the goal post. A line 3.16m long running parallel to the goal line between the goal posts joins the upper portion of each quarter circle.

In each penalty area the penalty mark is drawn 6.0m from the midpoint between the goal posts and equidistant from them. A second penalty mark is drawn 10m from the midpoint between the goal posts and equidistant from them.

At each corner quarter circles with radius of 25cm from the corner are marked inside the pitch to form Corner Arcs.

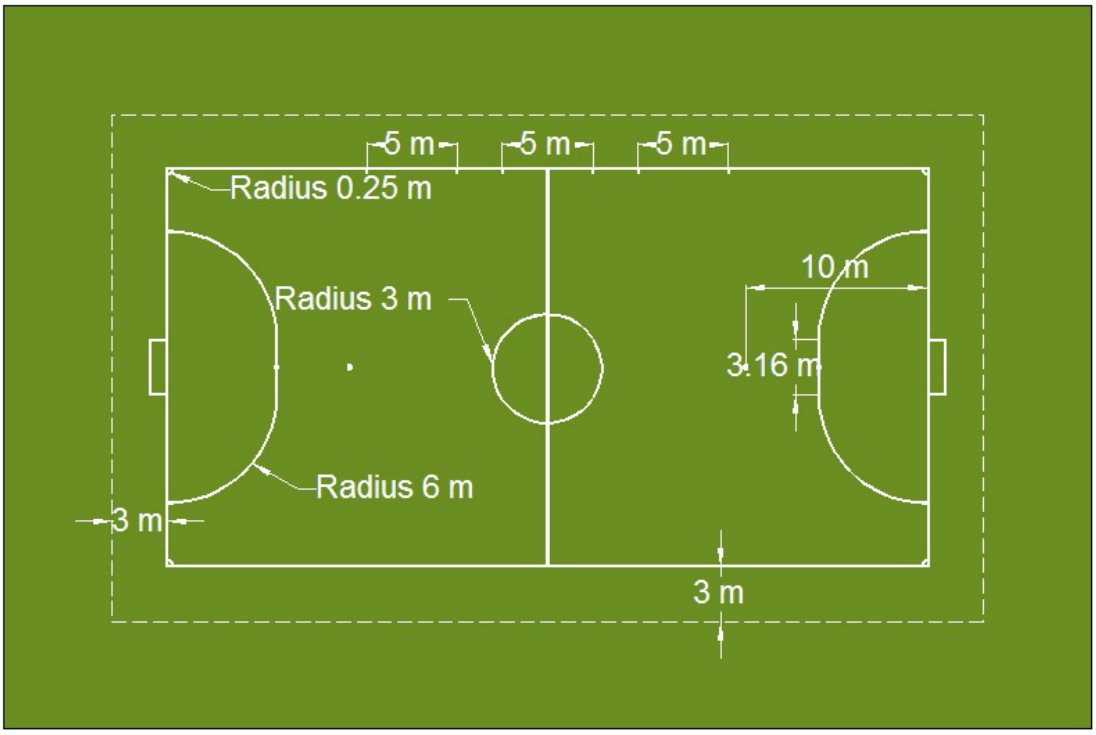

Figure 3 Markings for Futsal

Goals

Goals should measure 2.0m high by 3.0m wide.

Outdoor Lighting

If an outdoor pitch is to be lit the lighting system should be designed to achieve the performance detailed in Table 7.

Table 7
Floodlighting for Futsal (outdoors)

Property	**Requirement**
Maintained average luminance	> 120 Lux
Uniformity (Min/Ave)	>0.6
Glare rating	≤ 50
Lamp colour temperature	Tk > 4000 K
Lamp colour rendering	≥ 65

To minimise the running costs the lighting system may be designed to provide a lower level of lighting for recreational play and training etc. This should be no lower than a maintained average luminance of 75 lux.

Section 4 – Multi Use Games Areas (MUGA)

To maximise the benefits of a sports area it is common to use it for more than one sport. In most cases small sided football is one of the primary sports and the dimensions and surfacing information detailed in these guidance notes may be used as the basis of establishing the design requirements for the MUGA. Many other sports governing bodies provide similar information about the needs of their sports. Sport England has also published a number of guides that describe good practice in the design of MUGAs and particular attention is drawn to their *Technical Guidance Notes 374 (Multi-use Games Areas)* and their *Guide To The Design, Specification & Construction of Multi Use Games Areas (MUGAs) including Multi-Sport Synthetic Turf Pitches (STPS)* available on www.sportengland.org.

Figures 4 and 5 shows examples of a MUGA layout based on small sided football. Figure 4 shows two pitches for small sided football and one for futsal. On this design provision has also been made for recreational basketball, although markings for netball, mini-tennis, roller hockey and tag rugby could be incorporated. Due to the need for the Futsal goals to be free-standing (to allow their removal when cross pitch play or basketball takes place) the layout is only suitable for sites where management of goals can be ensured.

On sites where goals may be subject to misuse or vandalism it is recommended they be fixed permanently into recessed areas as shown in Figures 5. This layout

has pitches for small sided football and provision for recreational basketball practice. The side recesses on both designs may be used to form the Small Sided Football goals or free standing goals (suitably secured in use) can be stored in the recesses when not in use.

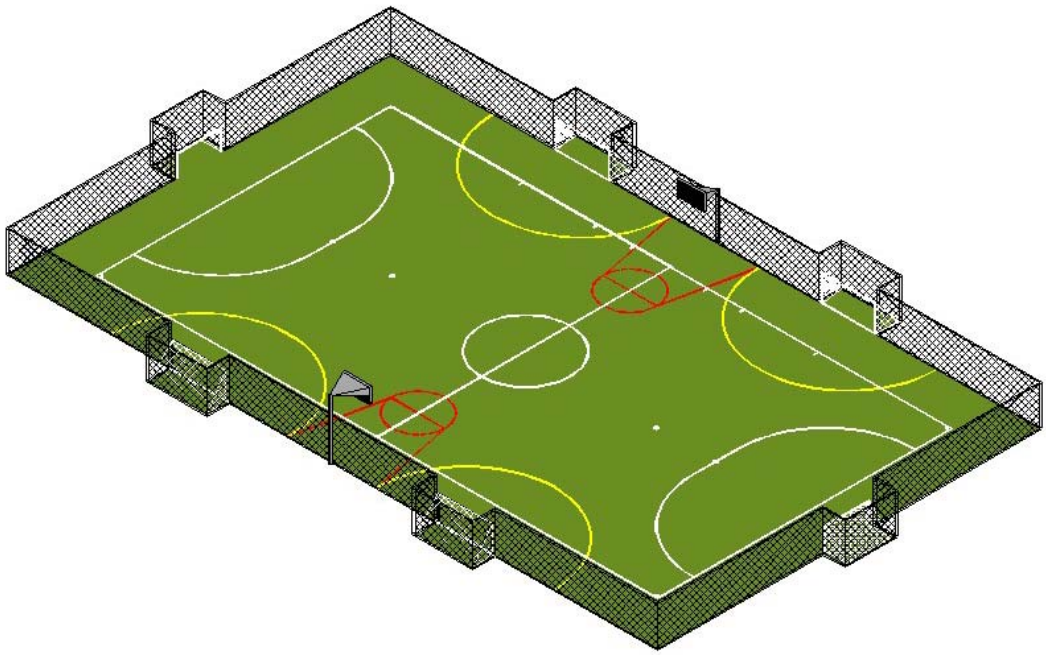

Figure 4a - MUGA with facilities for Futsal, small sided football and recreational basketball (note this design requires free standing Futsal goals)

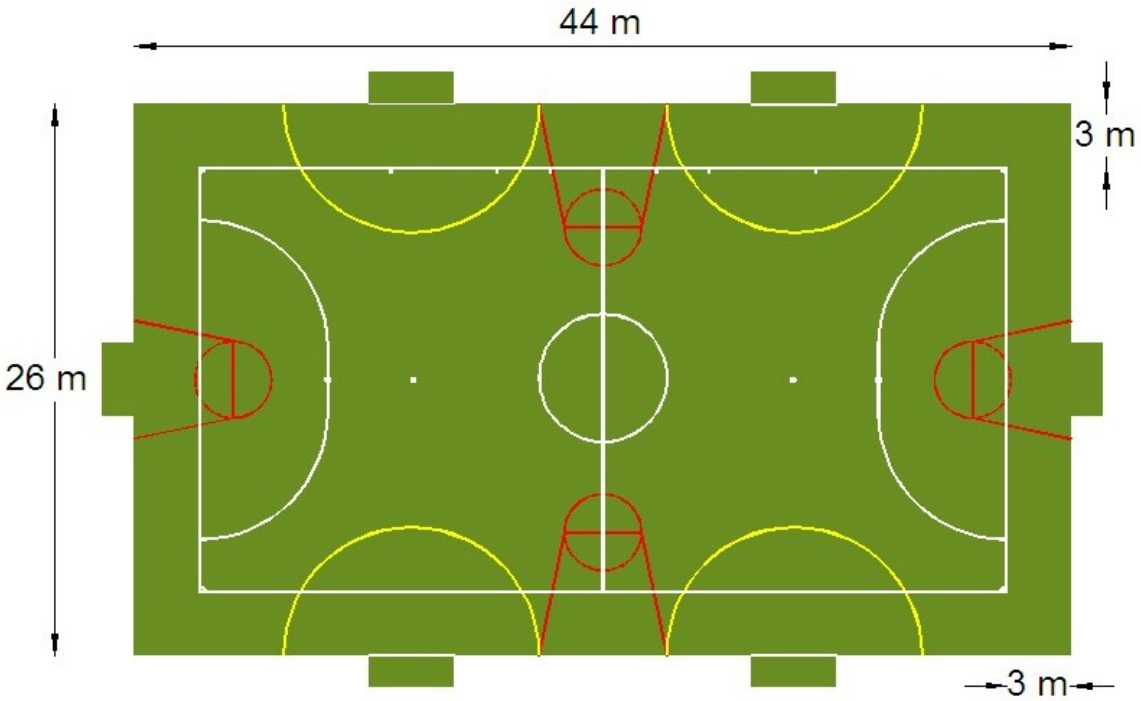

Figure 4b - Dimensions of MUGA with facilities for Futsal, small sided football and recreational basketball

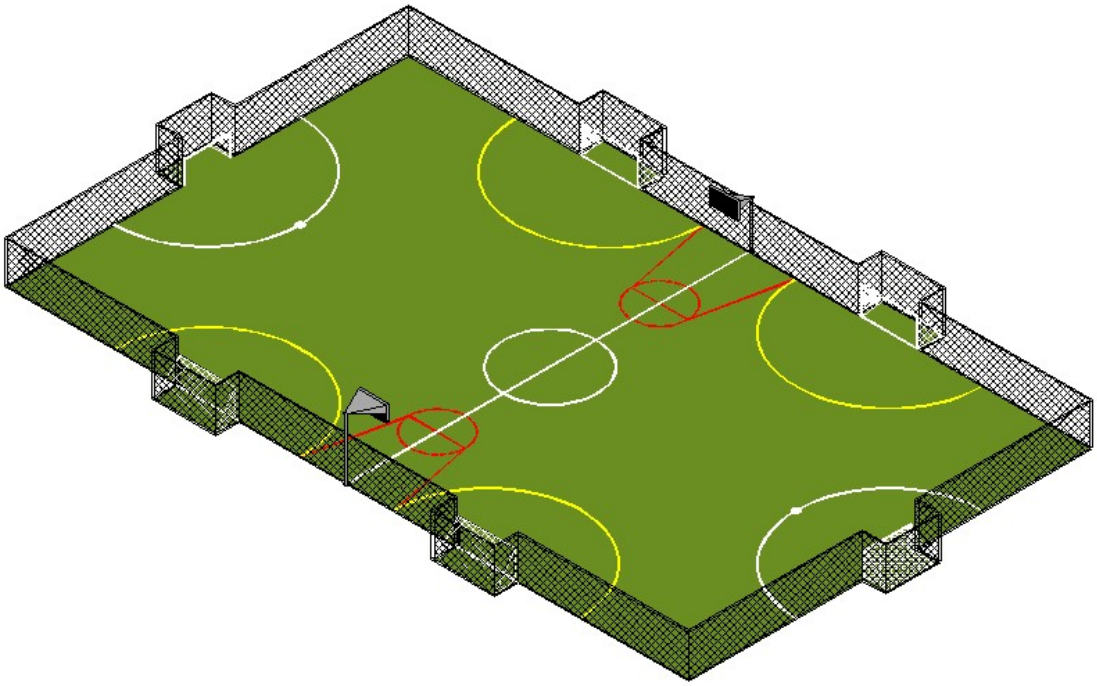

Figure 5a - MUGA with facilities for small sided football and recreational basketball practice

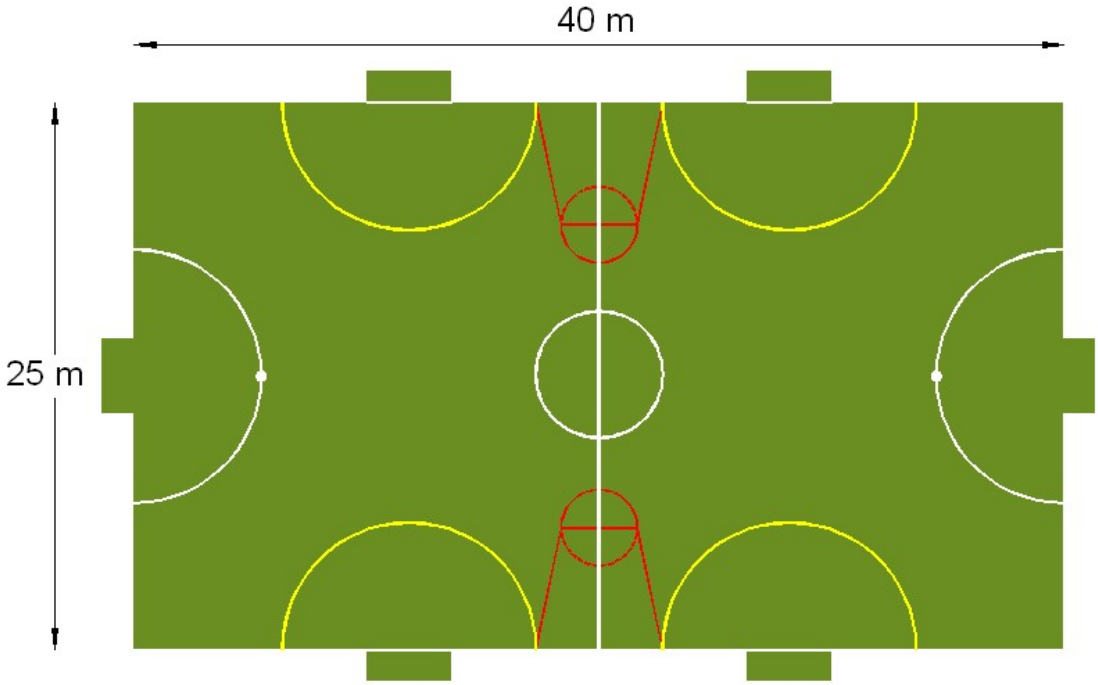

Figure 5b - Dimensions of MUGA with facilities for small sided football and recreational basketball practice

Section 5 – Surface types

Whilst natural grass may still be considered to be the best playing surface for football the need for pitches to sustain high levels of use and the player's desire to compete indoors has meant that the various forms of football below the eleven-a-side game have, for many years, been played on a range of artificial surfaces. This section describes the various types of surface that are commonly used and details the performance and construction tolerances that should be achieved by pitches surfaced with each.

The various forms of small sided football, mini-soccer and Futsal will inevitably result in players falling onto the surface and the potential for abrasion and impact injuries through such collisions should be an important consideration when selecting a surface type. Part 1 of British Standard (BS) 7044: *Artificial Sports Surfaces* states that the ability of a surface to reduce impact forces is an 'important' property of an artificial surface on which football will be played. Part 4 of BS 7044: *Specification for Surfaces for Multi-Use* specifies that unless an artificial sports surface provides a specified minimum level of shock absorption it should be designated '*Non Impact Energy Absorbing'.* The implications of using surfaces that fall into this designation need careful consideration.

Macadam

Historically one of the most common forms of surface used for small sided football areas, macadam provides a durable relatively cheap playing surface. The surface is hard, unyielding and abrasive and can result in injuries when players fall on it. Despite these limitations the FA acknowledge that in areas of high potential vandalism or where abuse or budgets are limited macadam may be the only viable form of surfacing and, working on the basis that a macadam playing area is better than no playing area, we support the use of the surface.

Macadam may be of a dense, medium or porous grade. Whilst dense macadam provides the strongest and most durable surface and is typically laid on school playgrounds etc; its inability to drain is a major constraint on its sporting use. Medium grade macadam will allow a limited degree of water percolation through its structure, but does not always ensure puddles will not form on the playing surface. For this reason porous macadam is considered the most suitable and is used on

many sports facilities.

Many macadam sports areas are painted with specially manufactured coatings that are spray applied to improve the appearance of the pitch. The use of the correct type of paint is critical if the pitch is to retain acceptable levels of slip resistance in wet/damp conditions for a reasonable period of time and experience has shown water based polyurethane paints are best suited to areas used for football. Colour coatings should be applied in accordance with the Code of Practice published by the Sport and Play Construction Association (www.sapca.org.uk).

The maintenance of macadam surfaces comprises:

- removal of leaves and other detritus from the playing surface
- power washing of porous surfaces to remove the dirt and debris that collects within the macadam surface
- application of moss killer when required on porous surfaces
- re-colour coating, where appropriate, approximately every five years

Table 9
Construction & performance requirements for macadam football areas

Property	**Test method**	**Requirement**
Slip Resistance (colour coated courts and line markings)	BS 7044 Section 2.2 Method 3	Greater than 60 dry and wet
Permeability (porous macadam)	BS 7044 Section 2.5 Method 4	Greater than 100mm/h
Surface regularity	3m straightedge	$\leq$8mm
Gradients & profile	Porous macadam	Single plane with fall no greater than 1% (ideally $\leq$0.83%)
	Medium & dense macadam	Single plane with fall of 1%
Colour coating application	The paint surface should be free from blisters streaks, cracks or other defects. The edge of any lines shall be no more than 2mm proud of the surrounding macadam surface.	

Polymeric Surfaces

Polymeric surfaces are made from rubber granules (normally recycled tyres) bonded together with a binder. The surface is laid in a continuous layer across the area, and colour coated to provide a shock absorbing, porous and relatively durable surface Wear of the colour coating can result in the surface becoming slippery, however when wet or damp and the coating needs to should be periodically reapplied. The frequency of this will depend on the intensity of use, cleanliness of the pitch and the degree of contamination from surrounding features (trees etc). For pitches subjected to high levels of use or contamination the frequency of recoating may make the use of this surface inadvisable.

Table 10

Construction & performance requirements for polymeric football areas

Property	**Test method**	**Requirement**
Football rebound	BS 7044 Section 2.1 Method 1	Between 25% and 50%
Slip Resistance	BS 7044 Section 2.2 Method 3	Greater than 60 dry and wet
Peak deceleration	BS 7044 Section 2.2 Method 4	<200g at fall height of 1.0m
Permeability	BS 7044 Section 2.5 Method 4	Greater than 100mm/h at practical completion and for the following 24 months
Surface regularity	3m straightedge	≤6mm
Gradients & profile	Single plane with fall no greater than 1% (ideally ≤0.83%)	
Surface durability	In accordance with Table 3 of BS 7044 Part 4 Class O	
Surface Environmental Resistance	In accordance with Table 4 of BS 7044 Part 4	
Tensile properties	BS EN 12230	Tensile strength: >0.4 MPA Elongation at break:>40%

The maintenance of polymeric surfaces is similar to macadam surfaces, although the need to recoat is likely to be more frequent than on macadam.

Sand filled artificial grass & needle-punch carpets

Sand filled artificial grass surfaces is one of the most common forms of surface used for small sided football. There are many different types artificial grass

construction with a range of properties, 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. Tables 12 and 13 show the minimum construction requirements for artificial grass surfaces considered suitable for small sided football.

Table 11
Construction & performance requirements for sand filled synthetic turf and needle-punch football areas

Property	**Test method**	**Requirement**
Football rebound	BS 7044 Section 2.1 Method 1	Between 25% and 50%
Football velocity change	BS 7044 Section 2.1 Method 3	Between 0.25m/s and 0.75m/s
Peak deceleration	BS 7044 Section 2.2 Method 4	<200g at fall height of 1.0m
Rotational friction (Traction)	BS 7044 Section 2.2 (using dimpled rubber test sole)	Between 1.1 and 2.0 dry or wet
Permeability	BS 7044 Section 2.5	Greater than 100mm/h at practical completion and for the following 24 months
Surface regularity	3m straightedge	$\leq$6mm
Gradients & profile	Single plane with fall no greater than 1% (ideally $\leq$0.83%)	

Table 12
Properties of sand filled synthetic turf

Property	**Requirement**
Pile height above backing	$\geq$23mm
Pile detex	>8,800
Pile weight	$\geq$ 1,000 g/m^2
Tuft density	$\geq$ 18,000/m^2
Tuft withdrawal	>20N
Seam strength (BS 7044 Section 2.5)	$\geq$0.25N/mm

Table 13
Properties of sand filled needle-punch carpets

Property	Requirement
Pile height above backing	≥ 11mm
Fibre weight	≥ 1150 g/m^2
Total weight	≥ 1300 g/m^2
Backing thickness	≥ 3mm
Seam strength (BS7044 Section 2.5)	≥ 0.25 N/mm

To provide the correct levels of performance a sand filled artificial grass or needle-punch carpet is normally laid over a shockpad typically around 15mm thick. The most common types of shockpad are made from rubber crumb/shred mixed with a resin binder, either manufactured as prefabricated rolls or mixed and laid in-situ.

Table 14
Properties of granulated rubber insitu shockpads

Property	Requirement
Binder content	≥ 5% by weight
Tensile strength (BS EN 12230)	≥ 0.1Mpa

The maintenance of sand filled artificial grass and needle-punch surfaces is vitally important if the pitch is to retain acceptable performance and be long lasting. The contractor's guarantee will also usually be conditional on the recommended maintenance requirements being carried out with reasonable diligence. It is therefore essential that this vital aspect of the pitch's management is not over looked.

Routine regular maintenance

- Drag matting / brushing to redistribute infill
- Brushing to lift the pile that will flatten through the actions of play. Failure to do so will result in a faster surface and more fibrillation and matting of the carpet's pile with a deterioration in performance
- The localised topping up (penalty spot, centre spot, corner kick areas

etc) of fill materials to ensure consistent ball and foot responses from the surface and to provide support to the carpet's pile

- The removal of litter, leaves and other debris from the surface

- Removal of moss or weeds particularly around the edges of the pitch where it is harder to get mechanical brushes into.

The frequency of such maintenance will vary but is likely to be at least weekly and on regularly used pitches more frequently. Such maintenance is undertaken using specialist plant and is likely to take around one hour per session.

Long pile artificial football grass

The increasing market demand for artificial surfaces that simulate the playing qualities of natural grass and can accommodate the use of studded football boots has led manufacturers to develop new forms of synthetic grass. These surfaces, often described as long pile (or third generation), artificial grass have a much longer pile than sand filled surfaces and are normally partly filled with rubber or rubber and sand mixes, although a small number have no fill. The enhanced playing qualities of these surfaces has led to their rapid acceptance within the football world and stimulated much interest from the game's governing bodies.

The FA have defined the characteristics they consider long pile artificial surfaces (for community use) should have in their *Guide to Artificial Grass Pitches for Community Use Part 1 Performance Standards for Surfaces and Pitches Used Outdoors* (available of www.thefa.com/grassroots/). Pitches should fully satisfy the requirements of this standard.

The maintenance of long pile artificial grass requires similar principles to sand filled artificial grass modified to suit the longer pile and rubber infill. Failure to maintain these forms of surface will result in deterioration in performance and a shortening in the surface's service life.

Indoor sports hall floors

There is a wide range of artificial sports surfaces marketed for indoor sports halls in which small sided football is one activity. The flooring types fall into one of three general groups:

Area elastic floors – floor constructions incorporating some form of sub-carriage assembly that allows the playing surface to deflect when a player runs or falls on it - the deflection of the floor allowing the dissipation of impact energy. Although this category of surface is normally the most expensive it has become the type most popular.

Point elastic floors – surfaces that incorporate some form of shock absorbing layer

that is designed to deform locally at the point of impact allowing the dissipation of impact energy. The shock absorption characteristics of these types of surface are not normally as good as area elastic floors, particularly when subjected to higher impacts forces.

Non-cushioned floors – thin surfaces that are laid directly onto the sub-base of the sports hall (normally a concrete slab). Due to the hardness of these types of surface they are not now generally considered suitable for football.

Table 15
Construction & performance requirements for indoor multi-use sports hall floors used for football

Property	**Test method**	**Requirement**
Football rebound	BS 7044 Section 2.1 Method 1	Between 25% and 50%
Slip Resistance	BS 7044 Section 2.2 Method 3	Greater than 60 when dry
Peak deceleration	BS 7044 Section 2.2 Method 4	<200g at fall height of 1.0m
Surface Durability & Environmental Resistance	In accordance with Tables 3 and 4 (air ageing) of BS 7044 Part 4	
Surface regularity	3m straightedge	≤6mm
Gradients & profile		Flat

The range of indoor sports surfaces is large and facility developers are advised to seek guidance from manufacturers/suppliers as to the merits of individual products or product types. As many indoor sports halls are used for a number of sports the requirements of other sports also need to be considered when selecting a surface.

Section 5 – Fencing

Perimeter fencing is erected around the pitch to contain balls, to protect the playing surface from contamination and to help prevent unauthorised use and vandalism. For small sided football the fencing may also form the boundaries of the pitch.

Fencing heights vary but 3.0m is often used with 4.5m or higher behind goals or where the site requires as many balls as possible to be retained within the playing area (typically adjacent to roads, etc).

There are many factors that need to be considered when designing a fencing system and site developers should undertake an assessment of the site, its proposed use and adjacent properties. The local planning authority will also often have requirements and conditions which need to be met and early consultation is advisable.

Typically football areas are enclosed by 50mm square weld mesh panels or rolls that are suspended from box section posts. Weld-mesh is used, as it is better suited to the repeated impacts of footballs.

The use of more closely spaced 358 gauge weld-mesh is worthy of consideration behind and alongside goals etc (on pitches where rebound walls are not required) as it offers even greater resistance to the repeated impacts of footballs.

Steelwork should be galvanised to minimise premature corrosion and can be plastic coated to improve its appearance and provide a bright colourful appearance.

Where appropriate, on small sided football pitches, rebound walls can be installed. These are normally 1.2m high and constructed from a variety of materials (normally exterior grade timber panels that are stained or painted, homogenous resin based exterior grade boarding, timber planking or block/brickwork). Whilst the use of exterior or marine grade timber panels and pressure treated timber planks will extend the life of the boards, cracking and delamination can occur in the longer term meaning periodic replacement will be required and this needs to be budgeted for in the life cycle costs of the facility.

If timber planks or slats are used they should be smooth planed to a minimum thickness of 20mm. Mounting bolts for planks and panels should be roundhead on the inside face of the pitch. Suitable provision for expansion and contraction of the boards or planks should be allowed for in the design.

The repeated noise of balls rebounding from the boards can also be a source of great annoyance to neighbours of small sided football pitches and is often a contentious issue when planning approval is being sought. The use of rebound fencing manufactured from dense (358 gauge) weld mesh panels seems to reduce the noise generated by balls striking the fence and also overcomes many of the cracking and delamination problems associated with timber panels. The open nature of the mesh is also particularly desirable on sites where bulling or abusive of the area is likely, as there are no areas that are out of site allowing supervision and viewing of the total area.

Access gates and doors should open outwards to ensure the safety of players. Single gates should be at least 1.2m wide to allow sport wheelchair access and gate thresholds should be level or slightly ramped (i.e. not stepped). Gates should also be positioned so they do not to create congested gathering points.

Section 6 - Goals

Incorrectly used goals can kill so goal post safety should always be of paramount importance to designers, builders, operators and users of pitches.

To help ensure good practice the FA have published *Goals for Football - FA Guidance Notes* (available on their web site http://www.thefa.com). These give comprehensive guidance and goals should always be purchased, installed and maintained in accordance with the recommendations.

When selecting goals and other sports equipment consideration should be given to the precise uses of the pitch so that changes in activity can take place with the minimum of effort and inconvenience. Goals can be freestanding, and therefore

easily moved, although it is important to make proper provision for their storage when not in use. This must not be on the run-offs of the pitch.

To conform to European and British Standards all freestanding goals must be fitted with anchors or weights, irrespective of size or type. The use of ground or fence anchors is recommended as they ensure the goals are always secured.

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