THE FA GUIDE TO 3G FOOTBALL TURF PITCH DESIGN PRINCIPLES AND LAYOUTS

Version 1.0
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WELCOME

This document provides information and guidance on the quality standards required in developing 3G pitches and also meeting planning applications and funding submissions, whilst outlining the recommended layouts for the following formats of the game:

- Mini Soccer 5v5
- Mini Soccer 7v7
- 9v9 football
- 11v11 grassroots football (adult and youth)
- 11v11 National League System

Sand-dressed, sand-filled and water-based Artificial Grass Pitches (AGPs) can be utilised for basic football training, but are not suitable for Mini Soccer, youth or adult 11-a-side football league matches. Only 3G Football Turf Pitches (FTPs) that have a valid performance test can be used for league matches and FA competitions where sanctioned.

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SUMMARY OF KEY FA TECHNICAL STANDARDS

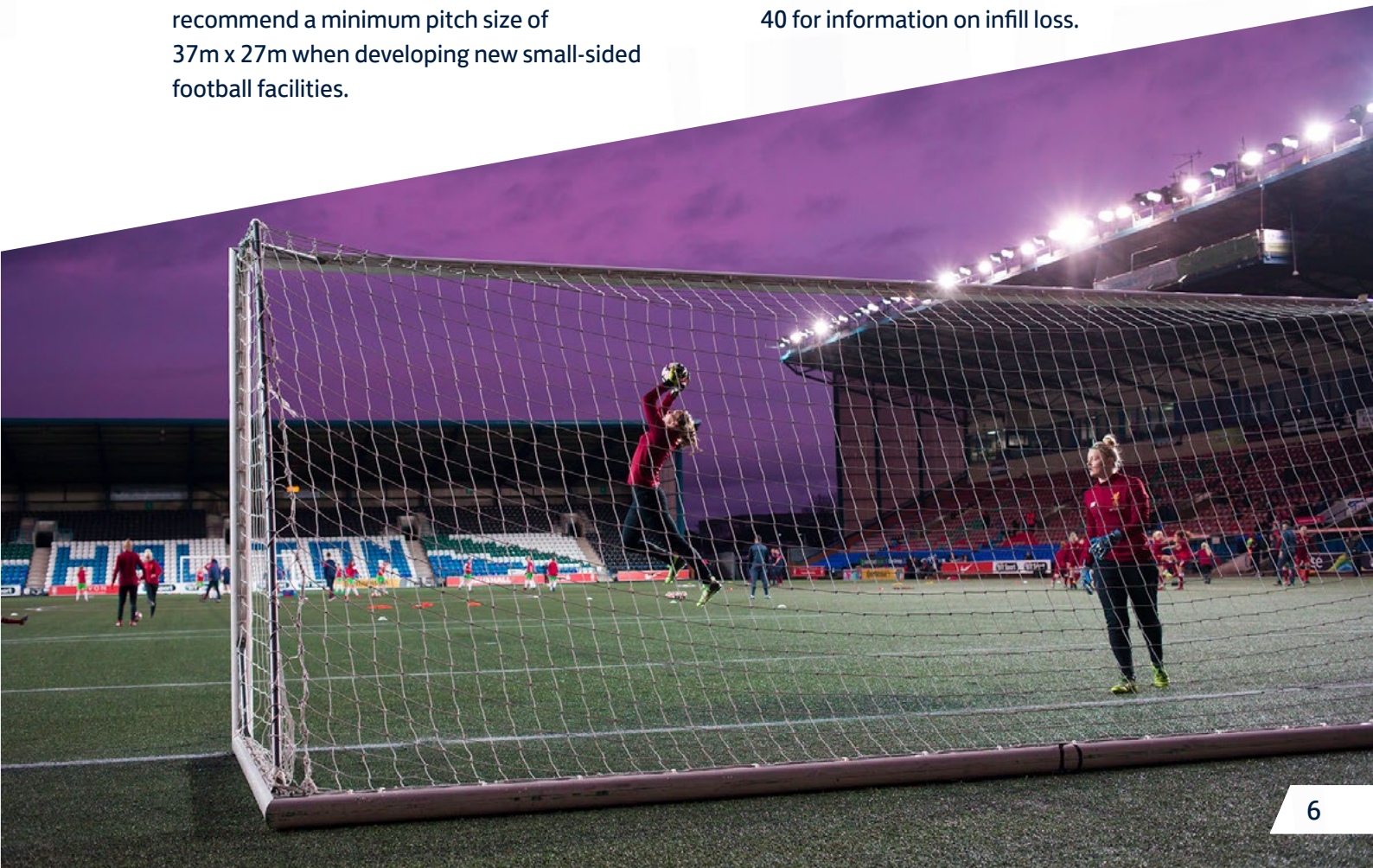
The FA are a partner in a compliant 3G construction framework that provides quality pitches at a competitive price and ensures pitches are built to the correct performance standards as detailed in this document.

The framework also ensures that the supplier warranty is retained for the pitch beyond completion and ensures player safety.

We have managed a framework for over 8 years and all projects that are funded via the Football Foundation will continue to use this framework. This is also available to access for any club, school or local authority that is considering constructing a pitch without funding.

Where football is the primary sport, all new 3G FTPs should be constructed to one of the following FA recommended sizes not including run offs (page 8).

- The FA advise organisations solely looking to develop small-sided commercial FTPs to adhere to the design principles within this document; to maximise the associated development outcomes, The FA would recommend a minimum pitch size of 37m x 27m when developing new small-sided football facilities.
- 3m run-offs should be provided on all sides of the main pitch and be free of any obstacle.
- A 300mm mowing strip should be provided to the external perimeter of all 3G FTPs. See page 40 for information on infill loss.



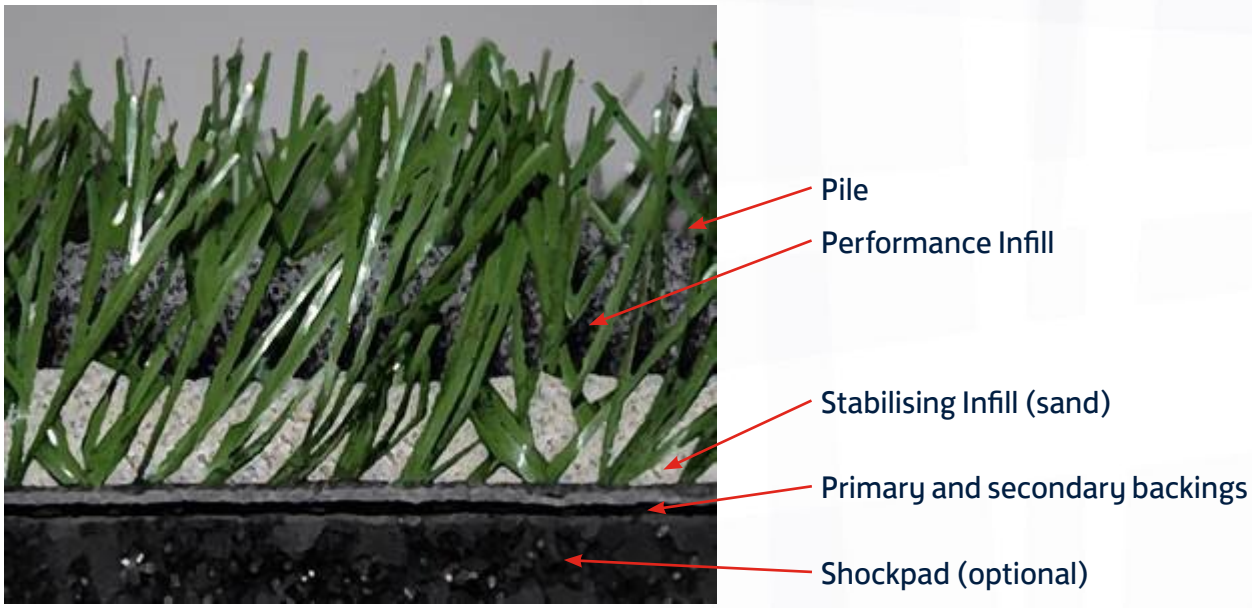
FIFA Quality Programme for Football Turf

The FIFA Quality Programme has been introduced to ensure players have good quality artificial surface to train and play on.

It also ensures consistency and transparency so that any organisation procuring or constructing a pitch can ensure it meets the performance requirements.

All full size 3G FTPs should meet the FIFA Quality Programme for Football Turf (2015) – Quality Standard or the International Match Standard (IMS) this is also requirement for affiliated match play.

Smaller pitches should be constructed to this quality standard and tested to BS EN 15330-1:2013 standard.



Principal elements of a 3G FTP surface

THE FA RECOMMENDED PITCH SIZES

Age grouping	Type	Recommended size without runoff (safety area around pitch)		Recommended size including runoff (safety area around pitch)		Total site footprint (including spectator areas)	
		Length x width (metres)		Length x width (metres)		Length x width (metres)	
Mini Soccer U7/U8	5v5	37	27	43	33	48	39
Mini Soccer U9/U10	7v7	55	37	61	43	66	49
Youth U11/ U12	9v9	73	46	79	52	84	58
Youth U13/ U14	11v11	82	50	88	56	92	62
Youth U15/ U16	11v11	91	55	97	61	103	67
Youth U17/ U18	11v11	100	64	106	70	112	76
Over 18 (senior ages)	11v11	100	64	106	70	112	76
Sand-based** pitch refurb - 1	11v11	91	55	101	63	107	96
Sand-based** pitch refurb - 2	11v11	91	55	101	61.4	101	63
Stadia FTP	11v11	100	64	106	70	120*	87*
Football + Rugby Union	11v11	100	64	126	75	126	86

*The size of the spectator areas depend on the League Ground Grading requirements and site specific layouts. Therefore the overall footprint will vary from ground to ground.

** See the Appendices document for The FA guide to 3G football turf pitch design principles and layouts

Goalposts

Incorrectly used goals can be dangerous, so the use of suitable goals must always be of paramount importance to all organisations and individuals responsible for the provision of goals. To minimize the risk of hazardous goals being used, a series of British (European) Standards have been developed.

The standards cover goals used for competition, training and recreational play in indoor and outdoor areas, including sports stadiums, sports grounds, educational establishments, commercial facilities and public recreational spaces. The standards specify the functional and safety requirements for all types of socketed and portable (freestanding) goals.

All goal posts must meet the latest versions of the standards - BSEN748:2013+A1:2018 and BS/EN 16579:2018. It is strongly recommended that all goals purchased comply with the relevant standard.

For more information on goalposts safety also refer to The fa guide to pitch design, management and goalpost safety.

Floodlights

Floodlights allow 3G FTP pitches to be used all year round and provide high usage especially in winter months.

Floodlights need to be designed in such a way to allow each individual section of the pitch to be individually programmed.

When new or improved installations are being planned, the lighting procured must meet BS 12193 Class 2 and have an average lux reading of at least 200 lux.

For full size matches (FIFA Class II): Maintained average illuminance: >200lux min Uniformity (min/ave): >0.6

Floodlight technology can comprise Light Emitting Diode (LED) or Metal Halide luminaires.

Due to the extended hours of use associated with Football Turf Pitches it is recommended that all FTP floodlighting installations utilise the latest Light Emitting Diode lighting technology. LED lighting offers many advantages over conventional Metal Halide systems, including energy saving, long lamp life, instant light, flexible dimming and improved colour. LED technology is more expensive than Metal Halide, however, the reductions in energy and maintenance costs will result in a payback of the additional installation expense.

LEDs offer reduced spillage with integrated louvres and cowls. Variable switches and dimming will allow the club to illuminate parts of the pitch they wish to use, particularly useful for training and managing/rotating pitch use.

For more information please refer to the FA Guide to Floodlighting.

Quality standards and testing

The objectives of the FIFA and IMS standards are to ensure that pitches are constructed with Football Turf surfaces of the required quality, that the surfaces are installed correctly, and that they provide safe and satisfactory playing environments throughout their service lives.
This is achieved by a three stage process:

STAGE 1

PRODUCT TYPE APPROVAL

The Football Turf surface is subjected to a comprehensive series of laboratory tests that assesses the performance, durability and material qualities of the surfacing system. Only Football Turf surfaces that have been tested and shown to comply with the relevant standard should be considered for possible selection when designing a Football Turf pitch.

STAGE 2

INITIAL FACILITY TESTING AND CERTIFICATION

On completion the pitch should be tested to verify the Football Turf surface has been installed correctly and is providing the anticipated levels of performance. It is also recommended that a second test is completed prior to the end of the defects period (1 year) To ensure that the performance of the football turf and maintenance of the pitch is as specified/anticipated. Even the best quality surfaces will not perform acceptably if they are poorly or incorrectly installed and maintained.

STAGE 3

PITCH RECERTIFICATION

3G FTPs do degrade with age and use, it is vital that pitch operators implement a maintenance schedule as specified by the manufacturer and usually based on 1 hours maintenance for every 10 hours of use by 22 players. If the use is significant then this frequency will need to be increased – check the warranty for specific calculations for usage and for other details.

The pitch should also be regularly decompacted with the infill cleaned and re distributed and the pitch tested in line with the level of competition played on it. Failure to regularly maintain and periodically test may invalidate a field operator's public liability insurance, as they may not be able to demonstrate that the pitch is safe and still fit for purpose.

The pitch should be tested either annually for steps 1 to 6 of the National League System (before the season commences) or every three years for step 7 and below. The pitch should meet the required performance criteria and be registered on The FA register for 3G Football Turf Pitches.

For which standard applies for the competitions being played on the pitch and for details of who can carry out the performance test, please contact your County FA.

Choosing your 3G football turf type

Choose a high-quality turf that has been 3rd party verified. A poor-quality turf will quickly deteriorate and pose a potential health and safety risk. Look for labels such as European standard EN 15330-1 2013/ EN 14877:2013, FIFA QUALITY standards or any manufacturers on the 3G framework.

- Choose a turf with a higher density of grass fibres, or one that includes a proportion of texturised pile. This reduces the amount of infill needed, and the spray (the amount of rubber granule knocked up during play). It will be the approved system you are purchasing which has been tested both in the laboratory and performance tested after construction completion. A typical football pitch pile height could be 40 - 60mm.
- Incorporate a shock pad into your design – this can reduce the quantity of infill needed in the first place. Reducing pile length from 60mm to 40mm with additional shock-pad reduces the rubber content needed by 60-70%. Introducing a shockpad will also increase the cost of the construction but could extend the life of the carpet. High quality shockpads should last 2 or more carpet lives so need to be considered as a long term investment

Infill

Third generation or 3G Football Turf Pitches are recognised as durable, safe, year-round playing surfaces, able to withstand intensive use and all kinds of weather. They mean more people can benefit from all the associated social and health benefits of physical activity.

Granulate infill material helps replicate the playing characteristics of natural grass by supporting the fibres.

There are many different types of infill material used in the UK marketplace with varying performance & durability characteristics and costs some of which are still being tested in our climate and are unproven over a length of time.

Concerns have, however, been raised about the safety associated with some types of infill and their constituent parts, most commonly the presence of rubber crumb. We take these concerns very seriously. We have monitored numerous independent scientific studies on this issue, which have reported a very low/negligible level of concern for human health as a result of 3G pitches and rubber crumb. Indeed, the European Chemicals Agency has recently published its own findings, following an extensive EU-wide study, and has found no reason to advise people against playing sport on 3G pitches with rubber crumb providing the infill comes from a known source and is of the quality that is defined as being acceptable.

The Sports and Play Construction Association, the UK trade body for the sports pitch industry, has developed a voluntary industry standard that will provide minimum requirements that go above and beyond what is currently required for rubber crumb under European regulation. The FA and leading sport governing bodies all support this approach and will continue to work with the industry to provide reassurance that pitches in this country are safe.

It is important that the chosen infill meets the latest REACH restrictions for PAH (Polycylic Aromatic Hydrocarbons) content or Sport and Play Construction Association (SAPCA) industry standards and that any purchases provide certification showing that the infill meets these. The SAPCA protocol ensures this.

Please follow the links below for further information.

www.sapca.org

www.groundsmanship.co.uk/3gpitches

DESIGN PRINCIPLES

Planning

New build and certain refurbishment projects will require planning consent prior to the construction works starting.

They must follow the latest National Planning Policy Framework (2019) from the Ministry of Housing, Communities and Local Government.

The application, scaled drawings and a Design and Access Statement which covers the scale, amount, layout, landscaping and appearance.

Consideration should be given for access, sporting requirements, DDA requirements, lighting, noise, ecology, visual impact and archaeology amongst other local/national factors.

The planning process can take a minimum of 8-13 weeks.

What is required: the design component

Scale

Scale is the height, width and length of a pitch and associated features in relation to its surroundings.

Amount

The amount of development is how much development is proposed. For residential development, this means the number of proposed units for residential use and for all other development, this means the proposed floor space for each proposed use.

Layout

The layout is the way in which buildings, routes and open spaces (both private and public) are provided, placed and orientated in relation to each other and buildings and spaces surrounding the development.

Landscaping

Landscaping is the treatment of private and public spaces to enhance or protect the amenities of the site and the area in which it is situated through hard and soft landscaping measures. Statements should also explain the function of the landscaping, for instance for sustainable drainage purposes, providing shading or other climate change adaptation purposes, and explain how it will be maintained.

Appearance

Appearance is the aspect of a place or building that determines the visual impression it makes, including the external built form of the development, its architecture, materials, decoration, lighting, colour and texture.

Organisations wishing to develop a project should seek the advice from SAPCA approved Pitch Consultants or Planning Consultants with specialism in Sports Pitches.

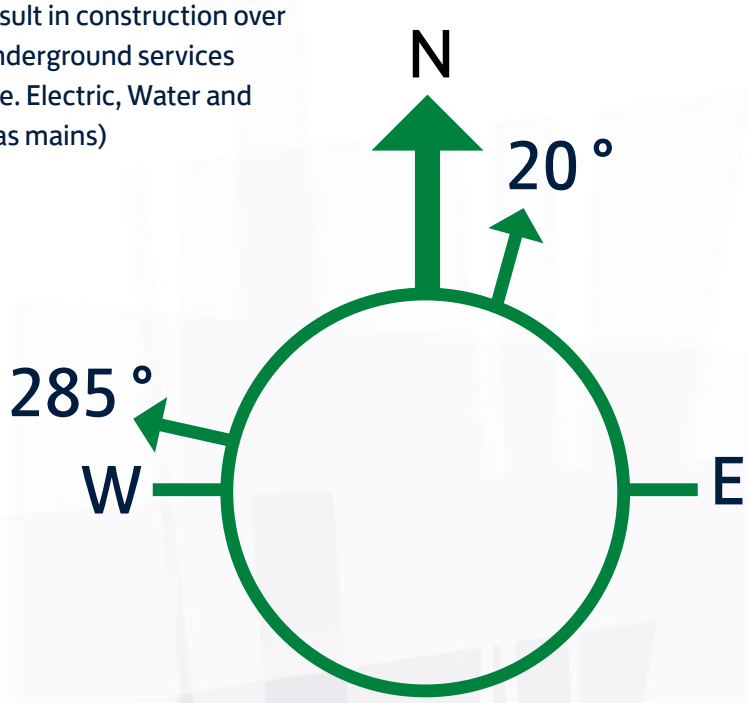
Pitch location and orientation

The design and cost of a new 3G FTP will be greatly influenced by the site on which it is to be built and it should be recognised that some sites are not cost effective to develop.

Ideally a pitch should be located:

- Close to changing accommodation and other support facilities.
- On relatively flat ground in order to reduce construction complexity and costs and to prevent contamination of the playing surface from run-off from adjacent banking, etc.
- In a sheltered location away from exposed terrain.
- Where the installation of services (electricity and drainage) will not be prohibitively expensive.
- Where easy access for maintenance and emergency vehicles is available.
- Away from trees, as roots and leaf litter can cause on-going structural and maintenance issues.
- Where players, spectators and maintenance equipment do not have to cross natural turf areas, as mud, debris and other contaminants will all contribute to the deterioration of the playing surface.
- So that the main playing direction is approximately north (between 285° and 20°) / south, to minimise the effect of a setting sun on the players; the inability to achieve this orientation need not preclude the construction of a pitch.
- On a site which does not result in construction over underground services (i.e. Electric, Water and Gas mains)

Early pre-application discussions with the local planning authority are encouraged in order to avoid any restrictions on usage which may influence the location of the FTP. If the project is not being funded by The Football Foundation (FF) and not going through The FF/FA/RFU Framework (as mentioned earlier), then we strongly recommend you engage a 3G FTP specialist who are a member of SAPCAs Professional Services Group to help you design the pitch in accordance with this guidance document.



REFURBISHMENTS, STADIA FTPs AND SMALL SIDED 3G PITCHES

Refurbishment design principles

Whilst you should follow the same standards as building new where possible, The FA recommends the following basic principles for refurbishment projects:

Procure a condition survey of the existing pitch, fencing and floodlighting.

If you are retaining the floodlight columns, but replacing the light fittings, a structural report for the columns will be required and LED heads are heavier than Metal Halide so a strength test may also be needed.

If an existing shock pad is proposed to be retained it must be tested prior to seeking tenders or quotations by a FIFA-accredited test institute to determine its exact properties and suitability for re-use.

Pitch markings should be agreed in conjunction with FA and County FA facility staff.
see page 21 for details.

An extra 300mm run off should be provided on all sides where folding goals are used.

Early discussions with your local planning authority are recommended to gain pre- application advice.

Legal Obligations - The lifting and disposal of existing synthetic turf carpets, infill and shockpads shall be undertaken in accordance with the Waste (England and Wales) Regulations 2011.

For examples of the recommended layouts please refer to page 5 of the Appendices document for The FA guide to 3G football turf pitch design principles and layouts.

Stadia FTP design principles

When constructing a stadia 3G FTP, providers should follow the following technical standards:

The playing surface should be 100m x 64m with a 3m run off on all sides free from obstacles; where an existing natural turf stadia pitch is being converted and space is limited the run off should be agreed with the league or The FA.

Where floodlights are located within the spectator hard standing area they should be padded to offer protection and risk assessed.

4.5m high ball stop fencing should be provided behind the two 11-a-side goals; this could be permanent or temporary depending on individual ground layouts and locations.

Providers should consider introducing additional 3m high ball stop fencing on sides of the ground where the boundary is in close proximity to the pitch.

Where new lights are being provided, The FA recommends a minimum of 200 lux to comply with the standards set for all FTPs; where existing floodlights in a stadia are being utilised they should comply with the minimum ground grading requirements (a structural report for the columns will be required).

Storage areas should be provided for maintenance machinery, goalposts and equipment not in use.

Only 11-a-side pitch markings should be tufted in during the manufacturing process.

All surfaces within the ground should be a bound surface (not grass) to prevent debris being walked onto the pitch.

Socketed goals are recommended for 11v11 goals on stadia FTPs.

Socketed corner flags should be used.

For an example of the recommended layout for a new build stadia FTP please refer to page 18 of the Appendices document for The FA guide to 3G football turf pitch design principles and layouts.

Multi use games areas and small sided 3G pitch design principles

The FA advises organisations to adhere to the design principles within this document in order to maximise the football development outcomes and enjoyment from all football facilities and pitch dimensions.

When not being built on playing fields and where this is not possible, the following amendments to the basic principles should be adopted:

The pitch should be rectangular and the length of the touchline must be greater than the length of the goal line. The FA recommends that the length to width ratio is 2:1.

If rebound boards are used they should be at least 1.2m high and comply with the requirements of BS EN 15312:2007: App F for Football Impact Resistance. The use of mesh fencing behind and above the rebound boards should be 4.5m high. The cost of replacing the rebound boards should be factored into sinking fund projections.

A maintained average luminance of 120 lux should be provided from floodlighting to comply with The FA's training requirements.

LINE MARKING

The largest pitch markings on the 3G FTP should always be white and training lines should be different colours. The white lines should be tufted in during the manufacturing process. The rest of the lines should be marked on by following these principles:

In accordance with Law 1, all lines must be of the same width, which must be not more than 12cm (5in). The additional pitch marking should be discussed in advance with FA or CFA staff. Upon agreement, providers may wish to consider having the corner right angles stitched into the carpet to act as a permanent guide for over marking. For an example, please refer to page 8 of the Appendices document for The FA guide to 3G football turf pitch design principles and layouts.

When over marking additional pitches The FA recommends using the following colours for each format of the game:

White: Main pitch markings

Red: Training lines and Mini Soccer U7 and U8 (5v5) - 37 x 27m

Yellow: Mini Soccer U9 and U10 (7v7) - 55 x 37m

Blue: U11 and U12 (9v9) - 73 x 46m

It is acceptable to mark pitches for Mini Soccer and 9v9 by using flat cones.

If technical areas are to be marked they should be on the opposite side of the pitch to the viewing area and marked in accordance with the laws of the game.

Types of paint application

Applying a polyurethane compound (paint) is one option available to providers. A specialist should be considered to carry out these works as mistakes can prove to be costly. Application utilises airless spraying and surrounds or coats the fibre giving a hard wearing painted surface that can last 12-18 months.

Paint "build-up" can become a problem if the correct maintenance practices are not put in place. First application will be more costly as survey and set-out will need to be carried out, but with good maintenance practice the lines have improved longevity.

Water-based aerosols are a short-term solution carried out in-house. These types of paint may only last a matter of weeks but can be a cost effective option for some providers, especially those that have full time ground staff. If your facility requires multiple pitch markings, water based aerosols may be fit for purpose as the lines can fade when no longer needed. Always seek advice from a specialist company if you are unsure. Forward planning is essential and please bear in mind that your facility will require some down time.

FENCING, ACCESS AND STORAGE

Fencing

The FA recommended fence height on all sides of the 3G FTP is 4.5m.

Perimeter fencing is erected around a pitch to contain balls, to protect the playing surface from contamination and to help prevent unauthorised use and vandalism.

The fencing is normally constructed from twin bar super-rebound panels or rolls that are supported by box section posts. Twin bar super-rebound panels are used, as it is better suited to the repeated impacts of footballs hitting the fence. Steelwork should be galvanised to minimise premature corrosion and may be plastic coated to improve its appearance.

Viewing areas should be included on all 3G FTPs and have perimeter fencing 1.2m high, rising to 2m behind the goals and 3m away from the touchline. See appendix 1 for specific designs.

Access

At least one pair of double gates should be provided to allow maintenance and emergency vehicle access.

Single gate access and decontamination grills should be provided to every section of pitch available for cross play use. The furthest section away from the spectator entrance should have an additional single gate to aid ball retrieval.

Access gates should open outwards away from the playing area to ensure the safety of players.

The access pathway to the 3G FTP should be fenced to ensure players and spectators don't walk debris onto the pitch. The path must be a minimum of 1.8m in width, unless there are unavoidable pinch points where the width can be reduced to 1.2m for no greater than 6m in length.

Ensure a minimum clear height of 2.1m is maintained under trees, canopies etc.

Access routes should be level or have the shallowest gradients possible. Where the route is steeper than 1:60, but not as steep as 1:20, it must have a level landing for each 0.5m rise along the route.

For more details, please refer to Sport England Design Guidance Note - Accessible Sports Facilities. Available from www.sportengland.org

Storage

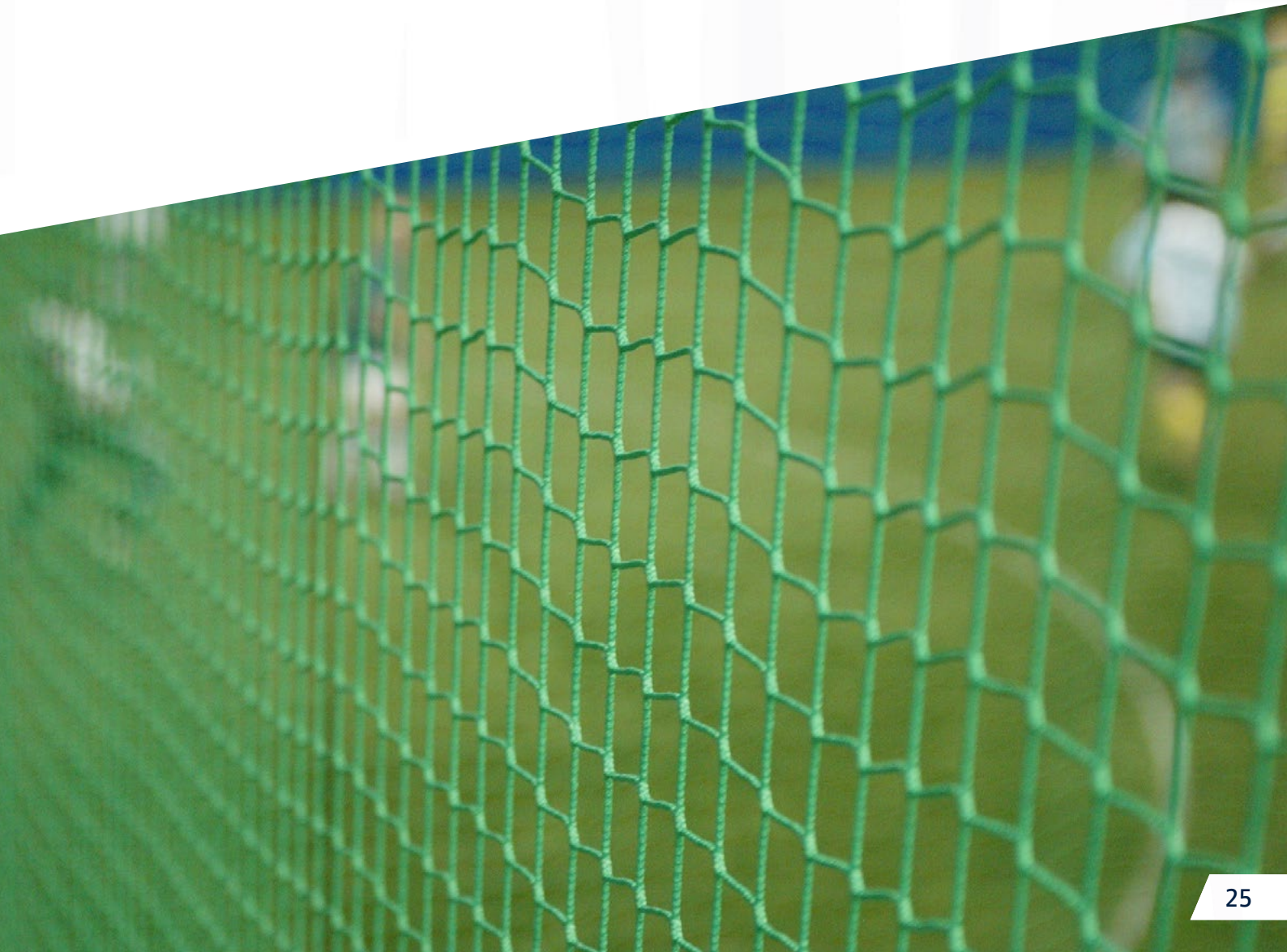
It is important to provide storage facilities in close proximity to the pitch. Weekly maintenance machinery and essential equipment should be safe, secure and stored in a location to allow easy access to the pitch from a tarmac area.

Goalposts not in use should be properly stored in the recess areas.

Pitch divider systems

Divider netting is optional and consideration should be given to the programme of use when determining the need. However, The FA recommends the use of divider netting on pitches where goals back onto each other – for examples see page 16 of the Appendices document for The FA guide to 3G football turf pitch design principles and layouts.

Dividing net systems with heavy duty net split into two or three sections, anti-vermin skirt, intermediate support posts, split cable with carabiner and winch system for upper and lower restraining wires are preferred. Consideration given for increased foundations for the dividing net posts and weighted net on exposed locations where wind is a known issue.



FLOODLIGHTING

A floodlight system will be required in order to meet the desired weekly usage levels on a 3G FTP.

The FA would always recommend constructing 3G pitches with floodlights so that the pitch usage and business plan can be optimised.

For further details linked to community play please refer to The FA Guide to Floodlighting available from TheFA.com/my-football

THE FA FLOODLIGHTING REQUIREMENTS

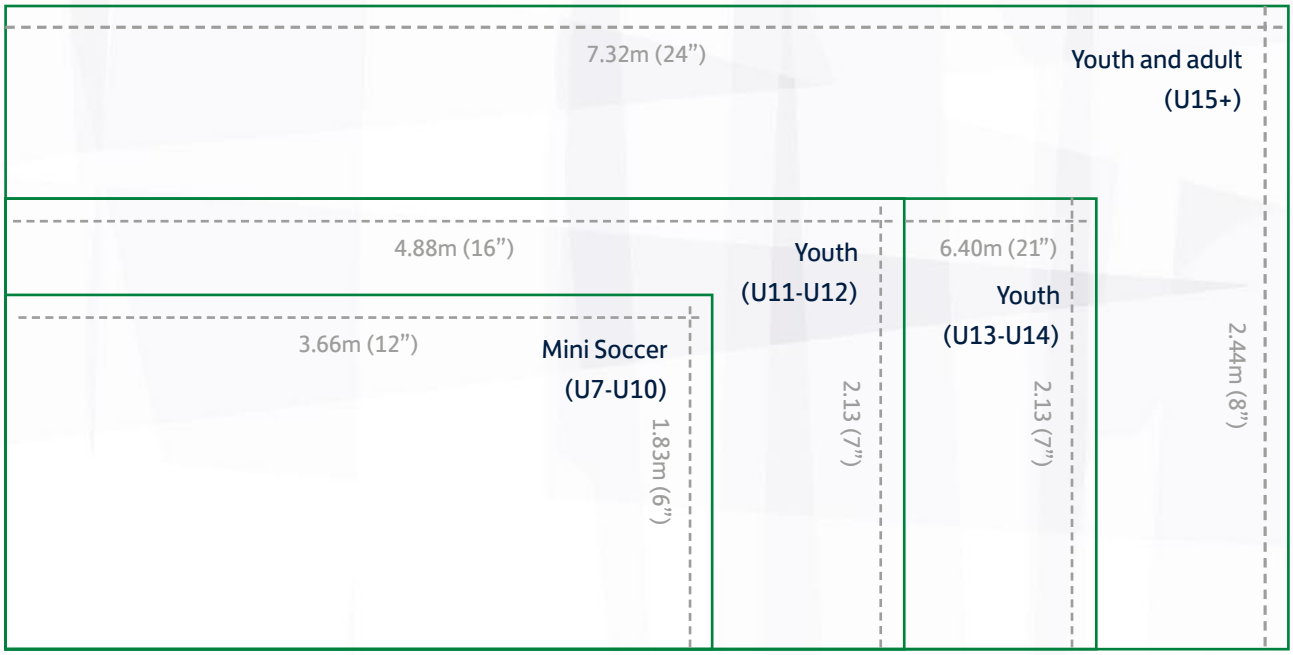
Use	Property	Standard
Full size matches (FIFA's Class II)	Maintained average illuminance	>200 lux
	Uniformity (min/ave)	>0.6
Cross play	Maintained average illuminance	>120 lux
	Uniformity (min/ave)	>0.6
Training	Maintained average illuminance	>120 lux
	Uniformity (min/ave)	>0.6

The recent introduction of Light Emitting Diode(LED) light sources are offering further energy and maintenance savings. The FA recently tested the efficiency and effectiveness of these lights and the increased cost could be justified on 3G pitches with the energy savings over a 6-7 year period. LED systems offer additional benefits over Metal Halide including instant light with no warm up, extended lamp life of over 50,000 hours, flexible dimming and the ability to run on single phase power supplies. As LED systems improve and become more affordable Metal Halide systems will eventually be phased out. This will influence the designs, for example remote switches or web based applications will allow the facility owner/operator to switch the lights on/off from an accessible point within the club house or via a smart phone tablet which is particularly useful on dark winter evenings. Variable switches and dimming will allow the facility owner to illuminate parts of the pitch they wish to use, particularly useful for training and managing/rotating pitch use.

*For further details linked to Stadia 3G FTPs, please refer to The FA Guide to Floodlighting and the appropriate FA Ground Grading Document.

GOALPOSTS

It is recommended that sockted posts are used on stadia 3G pitches (see diagram below). There will be a significant range of goalposts sizes utilised on a full size 3G pitch. The goalpost sizes are as follows:



If a pitch is provided for U13 / U14, 6.4m x 2.13m goals are recommended; however, subject to league rules, 7.32m x 2.44m would be acceptable, as not all sites are able to provide for this age group.

The size of goalposts purchased for your FTP should be based on your predicted usage plan and pitch markings.

All goal posts must meet the latest versions of BSEN748:2013 + A1 2018, BS EN 16579:2018.

For reference, you should note that The FA and BSI, in conjunction with the industry, have developed standards for goalposts – BSEN 748 (2013+A1 2018) and BS EN 16579:2018 as appropriate. It is strongly recommended that you ensure that all goals purchased comply with the relevant standard. A Code of Practice BS 8461 has also been completed and copies of all of these standards are available from the BSI via their website at bsigroup.com

Funding for goalposts are available via the Football Foundation and eligibility criteria and further details can be obtained from their website at www.footballfoundation.org.uk

The FA together with representatives from the industry, sports governing bodies and Government have prepared guidance notes for pitch users and pitch providers, which summarise the key priorities of the BSI's Code of Practice and provide further details on the information included above. These details are featured within the facilities section of The FA's website at TheFA.com/my-football

Mobile/free-standing goalposts

Free-standing goals need to be appropriately stabilised in accordance with the manufacturer's instructions.

Stabilisation of goalposts can be significantly affected by poor installation techniques, as well as by poor ground conditions. Consequently, the most reliable methods of stabilising free-standing goals is by attaching the back bar to permanent fixing points via eyebolts and stainless-steel loops set in concrete blocks, suitable attachment points on a permanent fence or wall, or using weights attached to the goal's back bar either in the correct positions as specified by the manufacturer, or integral to the goal. In all circumstances any equipment used to stabilise goals should be kept away from the immediate playing area to protect players and officials.

Please refer to the goalpost manufacturer guidelines for the most appropriate form of stabilisation method.

Selecting the right type of goal

"Football club admits failures after goalpost crushes boy"

BBC Wales July 2014

When selecting portable goals, those responsible for the management of a sports facility should consider the precise types of activity that may take place. A risk assessment is recommended to be undertaken in order to determine whether the chances of an injury occurring are likely to be higher due to a goal falling on to a person when it is being moved or due to the goal tipping or collapsing when it is being misused.

Goals, especially larger sized versions, can be either free standing and therefore easily moved (although it is important to make proper provision for their storage when not in use) or socketed when semi-permanent installation is required.

Socketed goals are recommended for the 11v11 full size pitch or where trained ground staff with suitable equipment are responsible for the erection, dismantling and movement of the goal, meaning the risk of injury from moving it is low.

Portable goals are designed to allow frequent movement. They are often used on synthetic turf pitches and natural grass training pitches and in indoor sports halls. As the goals are not socketed, they require some other form of restraining mechanism to prevent them from tipping. It is essential that portable goals are always anchored in accordance with the manufacturer's instructions. Traditionally, larger goals have been designed to be robust constructions that can withstand the types of misuse that might occur on unsupervised sites (such as people swinging on the crossbar, etc.). To withstand such misuse the goals are normally quite heavy (a full-sized football goal typically weighs over 70 kg).

"Schoolboy found with bones sticking out of mouth and neck after goalpost crush"

Scottish Metro Feb 2015

Concerns have been expressed that there is actually a greater risk of injury occurring when a portable goal is being moved or when it has not been correctly anchored and it tips and falls on to someone. Recognizing that on secure and well managed sites the chances of misuse are low, lighter-weight goals are also now available. These comply with the relevant laws of the game for the sport being played, but they are not normally as robust as heavier versions of the same-sized goal, meaning they may have a shorter life expectancy.

Consideration also needs to be given to the potential for a lighter-weight goal to be damaged sooner due to its less robust construction, meaning that it will require more frequent maintenance inspections and possible replacement.

If a potential purchaser is unsure which type of goal is most appropriate for their facility, they are advised to seek guidance from the FA.

"A tragic fatality on a sports pitch has implications for health and safety enforces"

Environmental News

Remember to use goal posts safely at all times.

Goalpost safety guidelines

The Football Association, along with the Department for Culture, Media and Sport, the Health and Safety Executive and the British Standards Institution, would like to draw your attention to the following guidelines for the safe use of goalposts. Several serious injuries and sadly even fatalities have occurred in recent years as a result of unsafe or incorrect use of goalposts. Safety is always of paramount importance and everyone in football must play their part to prevent similar incidents occurring in the future:

1. For safety reasons goalposts of any size (including those which are portable and not installed permanently at a pitch or practice field) must always be anchored securely to the ground or have a weighted back bar.

   Under no circumstances should children or adults be allowed to climb on, swing or play with the structure of the goalposts.

2. The use of metal cup hooks on any part of a goal frame was banned from the commencement of season 2007-08 and match officials have been instructed not to commence matches where such net fixings are evident for safety reasons. Nets may be secured by plastic fixings, arrow head shaped plastic hooks or tape and not by metal cup hooks. Any metal cup hooks should be removed and replaced. New goalposts should not be purchased if they include metal cup hooks.

3. Goalposts which are "homemade" or which have been altered from their original size or construction should not be used under any circumstances as they potentially pose a serious safety risk.

4. There is no BS/CEN standard for wooden goals and it is unlikely that wooden goals will pass a load or stability test. All wooden goals previously tested by independent consultants have failed strength and stability tests. The FA recommends that wooden goals should be replaced with compliant metal, aluminium or UPVC goalposts (this was updated in March 2012).

MAINTENANCE

The FA encourages facility owners and managers to take the maintenance of their 3G FTPs extremely seriously to ensure longevity and the health and safety of users.

3G FTPs should be brushed regularly and have a maintenance schedule in line with that recommended by the manufacturer. The general rule is for one hour of maintenance is required for every ten hours of use. This should be increased if flat sole shoes are used or the pitch has been used more than originally specified. 3G FTPs should not have any rubber visible on the surface and the carpet pile should stand upright. If rubber lies on the surface or the carpet pile is flat, then it is a sign that the pitch isn't being maintained sufficiently.

There are three broad types of surface maintenance:

Routine / Regular

Drag brushing to redistribute the infill, brushing to lift the pile, localised topping up of infill (e.g.. penalty spot, corner arcs), and the regular removal of litter, leaves and other debris. Bins and boot cleaning facilities should be provided in order to keep the pitch tidy, such as foot cleaning mats, boot scrapers and decontamination grills. Bins and boot cleaning facilities should be regularly emptied and cleaned.

Specialist maintenance

Surface cleaning, power sweeping and decompaction of the infill with specialised equipment to ensure consistent performance, seam inspection and removal of any moss or weeds. Due to the expense of the equipment this is usually undertaken as part of a maintenance contract. The frequency of visits should be dependent on the amount of use the facility receives.

Rejuvenation

If a surface is neglected and becomes heavily contaminated it will over compact and the drainage will be affected, reducing the performance characteristics and life of the pitch. In some circumstances the infill may need replacing through a rejuvenation process.

Replacement fund (Sinking fund)

It is considered that an artificial grass pitch has a life span of approximately seven to ten years depending on factors such as pitch type and quality, usage and maintenance. The FA strongly recommends that a sinking fund is established for the future replacement of the surface. It is estimated that the cost of resurfacing a full sized 3G FTP (including removal and disposal of the existing surface and infill and professional fees) will be between £180,000 and £200,000 at present day prices (as of January 2019).

A cost benefit exercise should be undertaken if a full rejuvenation of the carpet is being considered against the option of an early carpet replacement. It is suggested that an allowance of £25,000 per annum (full size pitch estimate) is placed into a 'ring-fenced' sinking fund account to cover these future costs.

Warranty

Manufacturers and sales people will often refer to a warranty. It is important to clarify if this is a product or performance warranty as the product is often hard wearing and will last some considerable time meeting the product warranty.

However, the product may not meet the performance requirements for match purposes that the pitch is being developed to meet should the usage exceed the manufacturers guidelines. If in doubt you should always seek guidance from the individual manufacturer.

Floodlight maintenance

Maintenance will need to extend to the floodlighting system, and it is suggested that following the completion of the defects liability period, a specialist floodlighting contractor is retained to maintain the system.

RECOMMENDED FOOTWEAR FOR ARTIFICIAL SURFACES

Footwear types					
	Trainer (general)	Trainer (astro turf)	Football boot (moulded stud)	Football boot (screw-in stud)	Football boot (blade)
3G football turf / long pile carpet	✗/✓ suitability depends on pitch operator	✗/✓	✓	✓	✗/✓

Recommended footwear

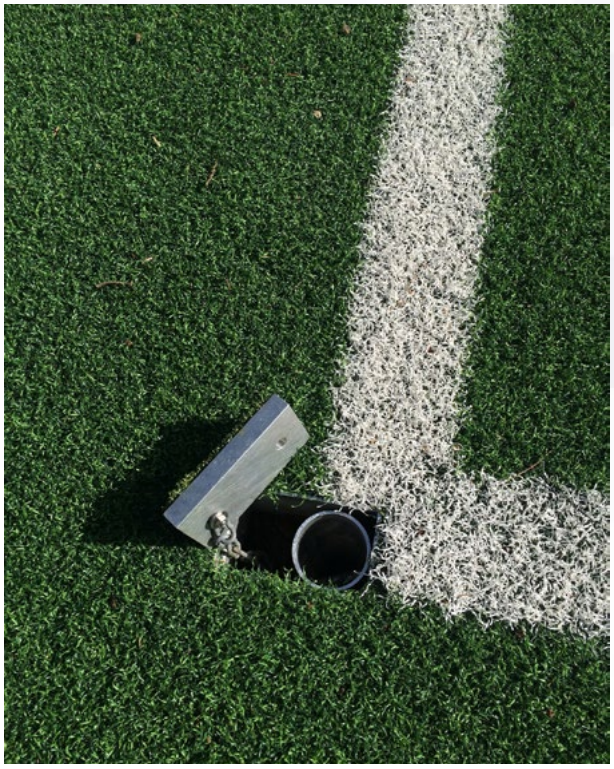
The above table is a reflection of the views of the carpet manufacturers on The FA's framework and not necessarily the views of all manufacturers and site operators.

The FA recommends users of 3G FTP's check with their own site operator or carpet manufacturer for specific details of which footwear is acceptable.

Site operators should erect a Do's and Don'ts board to advise users of acceptable footwear for their specific surface after discussions with their carpet manufacturer. The FA believes that footwear shouldn't limit childrens introductory programmes and the site operator, in conjunction with their pitch supplier, should agree what additional maintenance is required to offset the impact of this trainer/flat sole use.

Corner flags

Socketed corner flags are recommended for use on stadia FTPs rather than the free standing options shown below:



Rubber corner role base

INFILL

Infill material typically comprises two groups; stabilising infill and performance infill.

Stabilising infill is typically formed from silica sand and provides stability and weight to the carpet, ensuring it does not move or wrinkle, and supports the base of the fibres.

Performance infill supports the fibres helping them stay upright, provides a degree of shock absorption for player comfort and allows studded boots to be worn to gain traction and allowing the foot to slide.

There are many types of performance infill available in the UK marketplace including SBR Rubber granules which are formed from End of Life tyres that are processed and recycled into granules. This type of infill is the most common type found within 3G football turf pitches and are available in Black or as a coated product. They offer the best cost effectiveness to install and maintain and offer good performance characteristics.

Encapsulated SBR Rubber granules are standard ELT granules which are usually coated with PU or acrylic resin to offer alternative colours.

EPDM and TPE are alternative elastomers which are typically made from virgin material and are available in various colours There are several types of organic infill available which vary but are not limited to cork, bark, coconut husk and vegetable matter and are either 100% organic or a mix typically incorporating a quantity of EPDM or TPE granules.

The various infill materials have varying levels of sports performance, durability, maintenance requirements, user perception and costs and a thorough investigation should be undertaken to determine the correct material for the particular facility.

Safety

ECHA (European Chemicals Agency) undertook a review of available research and published their report on 28th February 2017 and concluded that "ECHA has found no reason to advise people against playing sports on synthetic turf containing recycled rubber granules as infill material".

The FA are working with trade associations such as SAPCA to develop higher standards where the manufacturing plants and material delivered to site are independently tested and certified to ensure the material more than meets the REACH requirements, regardless of infill type (see page 12).

Latest guidance from the FA and the Stakeholder group can be found groundsmanship.co.uk/3Gpitches

Managing infill loss

The synthetic rubber or plastic granules used on 3rd generation football turf pitches are a potential source of infill migration to the environment.

The 'rubber crumb', used to improve quality of play, particularly for football and rugby pitches, can be lost during use, escaping to drains, waterways as well as to soils surrounding the pitch. Loss of pitch infill can lower the quality of play and increase the chances of injury. It is also important to retain infill to meet the warranty requirements and reduce running costs. If well-maintained, pitches are topped up at a rate of 2-3 tonnes per year, which is an expense for those who own and maintain the pitches. These guidelines have been created to take into account infill loss during design, build and renewal of pitches. These guidelines are also relevant to procurement specialists, and those submitting a pitch construction to tender.

Recommendations are made assuming a new pitch is to be built, but many also apply to retrofitting old pitches. The aim is for any changes to be as simple and low cost as possible. The guidelines have been written in partnership with KIMO and Fidra by reviewing existing recommendations, reviewing best practice trials conducted internationally and by speaking directly to pitch owners, maintenance staff and industry representatives. They also take into account the recommendations being developed by the European Standards Committee responsible for sports surfaces (CEN).

It is essential that the procurement process starts with a requirement for the pitch to be designed to meet usage requirements but also in a way that minimises infill loss. This will ensure that all designers competing for the tender are required to incorporate at least some of the following design protocols, or other innovations, to reduce impact of microplastic pollution.

- Include infill management as an element of procurement. Within the procurement strategy, highlight infill migration as an issue and, within the tender process, value strategies which reduce the risks of contamination. Use the following guidelines to provide more specific criteria.

Designing the pitch and associated infrastructure

Any design should pose no additional risk to players. For example, all pitches in England have a requirement to include a run-off boundary at the pitch edge for health and safety reasons.

Pitch layout - Add a solid (e.g. tarmac) surface around the pitch (see diagram below). This means that maintenance staff can collect scattered infill material and put it back on the pitch. Design the boundary surface to avoid:

1. Joints where infill can accumulate

OR

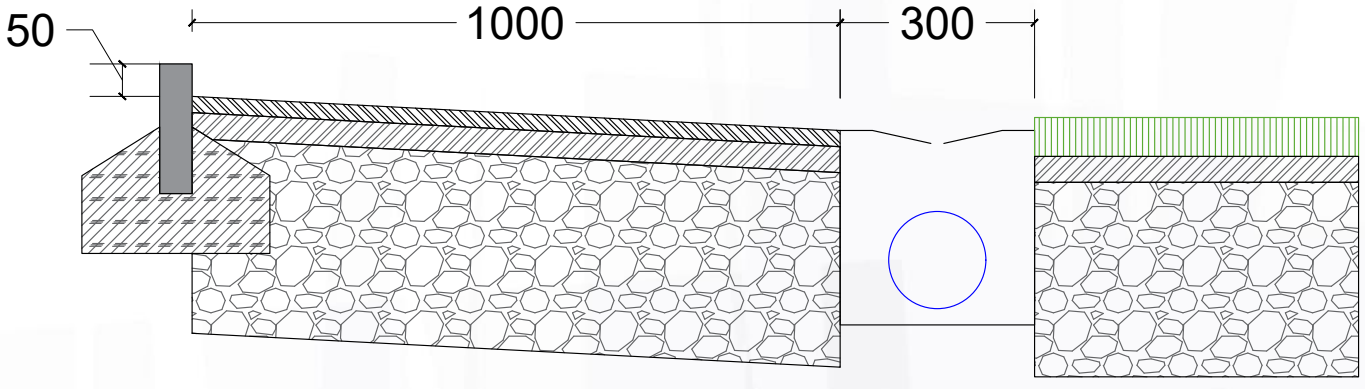
2. Using loose substrate (e.g. sand/gravel) that may contaminate the infill material. The FA recommends a 1m tarmac boundary.

Add an elevated edge. If there is no room for a solid surface around the track, or to add additional prevention, include an elevated edge, such as a curb, (this can be angled towards the pitch (see below) to reduce the loss of infill. This applies especially if the 3G turf course is elevated relative to the surroundings. Consider how the slope of the sports pitch might be adapted to reduce likely loss of infill. For further information and design options please refer to the CEN standards document.

A pitch for certain sports can be sloped by around 1-2˚– for example, creating a central crown to reduce chances of ponding on a poorly drained pitch. However, this also means over time infill might migrate to pitch edges.

Physical barriers

Install a low-level perimeter boarding at the base of the fencing around the pitch area. This is one of the easiest ways to reduce infill loss. This should be designed in a way to not pose a risk hazard to players. A perimeter strapping, solid or fine mesh, (circa 6 inches/150mm in height should be included as part of the perimeter fence - NB perimeter fencing should be of durable standard, an appropriate height for ball retention and most critically safe, i.e. far enough back from the playing lines not to be a trip or head strike risk or hazard. The FA recommends 4m from edge of play (3m run off plus a further 1m of hard stand for spectating purposes.



Pitch drainage and filters

1. Avoid as far as possible letting storm drains and gutters drain near the path around the pitch, so that microplastic does not spread unnecessarily to the aquatic environment.

2. Storm drains and drainage troughs with open shafts should be avoided.

3. Include silt traps in drainage plans to avoid infill being lost down storm drains. Approximately 35% of infill lost to drains can be prevented from entering watercourses through the use of simple silt trap. Advanced silt traps which filter out microparticles are available and if budget allows, these would filter out a higher percentage of infill from stormwater.

4. Add filters to drains. Consider installing removable filters or advanced silt traps in storm drains surrounding the pitch to ensure granules are not lost to drainage water.

5. Consider fitting a brush-off zone at the exit to collect loose granules as users leave the pitch. Options include:

   - Handheld brushes
   - Boot brushing stations
   - Stamp matts / 'cattle grid' style exit - Provide brushes within the pitch perimeter to allow users to remove loose granules before leaving the pitch. Existing brushes outside the pitch should be surrounded by a physical barrier to stop granules escaping to the wider environment. (See image below). For further design options please refer to the CEN standards document.

General maintenance

The information provided below is intended to help maintenance teams adapt their current care programme to minimise any loss of infill. Raising awareness with the team may lead to new ideas for how to prevent granule loss, which could be included in a personalised action plan for your pitch.

Handling infill

Take care when topping up infill -
When new infill is delivered or applied to the pitch, choose the best location to place the infill so that it is not dispersed into the environment by wind, rain or maintenance activities. If there is a danger of infill escaping to the surrounding soil or grass verges, temporarily cover/ shelter the verge, do not overfill the pitch. Ideally the grass pile should protrude 15-20mm above the infill layer so that the grass fibres keep the infill in place and less microplastics escape into the environment.

Store your infill safely -
Improve storage of new and used rubber granules, to make sure these are less likely to be lost by accidental spillage. For example, use a solid box storage system rather than plastic bags. Ensure the vessels used for storage are sealed and weather proof. This also prevents the material from being contaminated by leaves and other organic matter.

Equipment

Get the right tools -
Make sure that your maintenance equipment contains the necessary tools for recovering infill and preventing infill loss, for example adding a brush, rake, hoover, and filters leaves.

Take care with leaf-blowers -
Consider using rakes instead of blowers if there is no perimeter barrier in place to keep the infill on the pitch. If using a leaf-blower, blow the leaves from the outside to the centre of the pitch where they can be raked up.

Sweeping/Brushing

Redistribute infill on the pitch regularly. Regular grooming and drag-matting/brushing of the pitch is essential to keep infill evenly distributed and prevent excess loss of infill from the margins of the field. Infill tends to migrate to the margins of the fields from where it more easily escapes into the environment.

Sweep up escaped granules. Make sure loose granules at pitch edges are regularly swept up and, if reusable, returned to pitch surface.

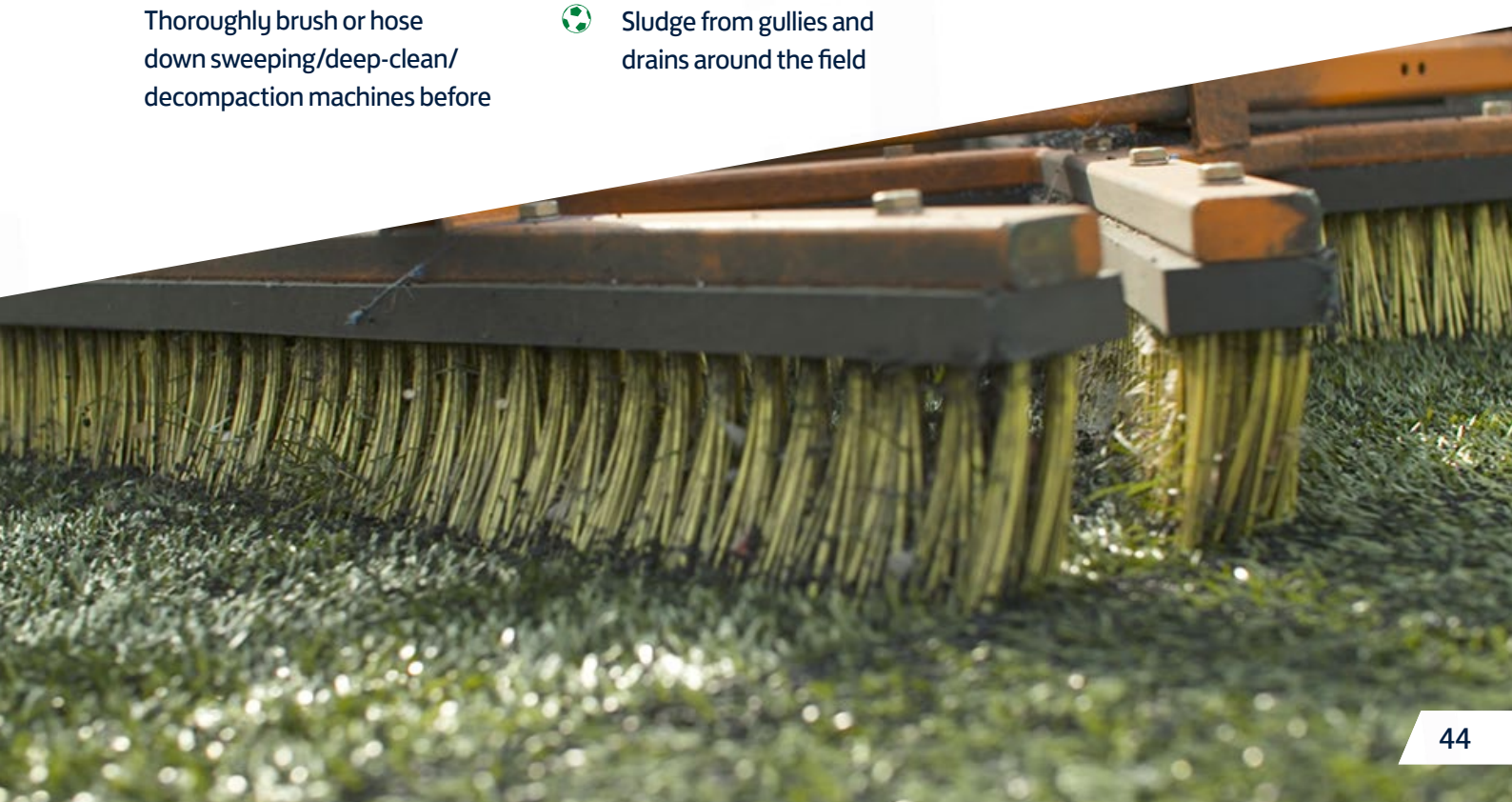
Use Power Sweeping machines that can collect and sort the rubber granulate for re-use. This cuts down on cost by reducing the amount of new granulate added to the fields each year. Machines can be shared across clubs further cutting down on costs.

Clean equipment carefully. Thoroughly brush or hose down sweeping/deep-clean/ decompaction machines before leaving the pitch as infill will cling to the tyres and frame of the machine and be transported away from the pitch.

Cover drains during maintenance work. If infill is dispersed into perimeter gutters and drains during maintenance activities, consider temporarily covering these before starting with sweeping/ brushing
Waste disposal.

Debris from on or near the pitch will contain microplastics.
The following materials will contain microplastics. Where the material can't be cleaned and granules returned to the pitch, it must be disposed of as rubbish (i.e. they should not be composted or returned to the environment):

- Leaf debris - Mixed debris from sweeping
- Sludge from gullies and drains around the field
- Avoid removing snow from the pitch. Snow removal from pitches can remove a huge amount of pitch infill. When it snows, consider leaving the snow on the pitch until it melts. If this is not an option, move the snow to one side of the pitch, so any granules that melt out remain on the pitch.
- Never move snow from the pitch onto grass or soil outside the pitch. If the snow must be removed from the pitch, be sure to place it on a hard surface or tarp (not the grass!) so that the rubber granules can be collected once the snow melts and re-used.



Help pitch users to keep the infill in

- Provide information to users using posters on the edge of the pitch to raise awareness and help players reduce microplastic loss, including. Why it's important to keep granules on the pitch.
- Provide instructions on how to use any brushes/cattle grid systems available.
- Provide instructions to dispose of any granules found in the bin and not outdoors or down the drain.
- Provide brushes to help players remove granules before leaving the pitch. Provide brushes for players to use within the protected pitch perimeter. Where possible install 'boot brushing' stations.
- Put filters in shower drains. Place granular traps in changing room drains - this will prevent microplastic being lost with shower water.
- Collect granules from kit. In the changing room, include a collection bin for loose granules found in shoes and kit.


The FA
FOR ALL