



GUIDE TO
SYNTHETIC TURF PITCHES FOR RUGBY LEAGUE

(First Edition)

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There are many ways of constructing a synthetic turf pitch. These guidelines do not constitute any form of approval from the Rugby Football league on a particular form of surfacing or construction but are intended to provide information to potential consumers to allow them to make informed choices when designing and selecting surfaces, contractors, etc.

Prepared for the RFL

by



www.labosport.co.uk

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1 INTRODUCTION

The last 15 years has seen major innovations in the development of synthetic turf surfaces; the development of longer pile surfaces now providing artificial surfaces that replicate the playing qualities of the best quality natural turf pitches whilst allowing significantly higher levels of usage. The success of these surfaces is such that they are now being used in major competitions for Association Football, Rugby Union and now Rugby League.

To assist potential developers of synthetic turf Rugby League pitches the Rugby Football League (RFL) have produced these guidance notes; they describes some of the many factors that need to be considered during the design, specification and construction of a synthetic turf pitch. They also include advice on maintenance, life cycle costs, and post installation monitoring and testing.

2 RFL PERFORMANCE AND CONSTRUCTION STANDARDS FOR SYNTHETIC TURF RUGBY LEAGUE COMPETITION AND TRAINING PITCHES

To ensure only synthetic turf surfaces of acceptable quality are used for Rugby League the RFL has developed its *Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches* (available at <http://rflfacilitiestrust.co.uk/home> . The objectives of the standard are to ensure pitches are constructed with synthetic turf surfaces of the required quality; that the surfaces are installed correctly and that they provide satisfactory playing environments throughout their service lives. This is achieved by a three stage process:

Stage 1 - product type approval - the synthetic turf surface is subjected to a comprehensive series of laboratory tests that assesses its performance, durability and material qualities. Only synthetic turf surfaces that have been tested and shown to comply with the RFL standard should be considered when designing a synthetic turf rugby league pitch; a list of such surfaces may be obtained from the RFL Facilities Trust Manager (email: Carol.Doran@rfl.uk.com).

Stage 2 – initial facility testing and certification - Following installation the pitch is tested to verify the synthetic turf surface has been installed correctly and is providing the anticipated levels of performance – even the best quality surfaces will not perform acceptably if they are poorly or incorrectly installed.

Stage 3 – pitch recertification - The pitch is re-tested throughout its life to demonstrate it is still providing a satisfactory and safe playing environment.

Note: The testing of pitches requires specialist test equipment and expertise and the RFL has accredited laboratories that have been independently assessed and shown to achieve the levels of competence and professionalism required. Only accredited laboratories can undertake RFL testing of

products and pitches. Details of suitable laboratories may be obtained from the RFL Facilities Trust Manager (email: Carol.Doran@rfl.uk.com).

3 USE OF SYNTHETIC TURF PITCHES IN RUGBY LEAGUE COMPETITIONS

The Rugby Football League has amended their rules to allow the use of synthetic turf pitches in all of their competitions subject to the following conditions:

1 Quality of synthetic turf

The installed synthetic turf surface has been laboratory tested and shown to fully comply with the relevant laboratory test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches*.

Surfaces to be used on pitches used for Super League or Championship matches shall have satisfied the 'Stadium' category of performance whilst surfaces used on all other levels of competition shall satisfy the 'Stadium' or 'Community' categories of performance.

2 Field certification

The synthetic turf pitch shall hold a valid Field Test Certificate showing it fully complies with the relevant field test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches*.

Pitches used for Super League and Championship matches shall satisfy the 'Stadium' category of performance, whilst pitches used for all other levels of competition shall satisfy the 'Stadium' or 'Community' categories of performance.

Super League and Championship category pitches

Pitches to be used for Super League and Championship matches shall initially be tested prior to any competitive match taking place. Thereafter pitches shall be retested annually, the date of test being within two months of the start of the playing season. A copy of the field test certificate shall be submitted to the RFL Facilities Trust Manager (email: Carol.Doran@rfl.uk.com) prior to a season commencing.

If a field is found to fail the Stadium category field test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches* it shall not be used until all necessary remedial works (including resurfacing if required) have been undertaken and the pitch has been fully retested and shown to satisfy the 'Stadium' category field test requirements of the *Rugby Football League Performance and*

Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches.

Community and amateur category pitches

Pitches to be used for community category matches shall initially be tested prior to any competitive match taking place. Thereafter pitches shall be retested every two years, the date of test being within two months of the start of the playing season. A copy of the field test certificate shall be submitted to the RFL Facilities Trust Manager (email: Carol.Doran@rfl.uk.com) prior to a season commencing.

If a field is found to fail the 'Community' category field test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches* it shall not be used until all necessary remedial works (including resurfacing if required) have been undertaken and the pitch has been fully retested and shown to satisfy the 'Community' category field test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches*.

Training fields

Pitches only used for training activities shall be initially tested following installation. Thereafter pitches shall be retested every two years. A copy of the field test certificate shall be submitted to the RFL Facilities Trust Manager Facilities Trust Manager (email: Carol.Doran@rfl.uk.com) following each field test.

If a field is found to fail the 'Community' category field test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches* it shall not be used until all necessary remedial works (including resurfacing if required) have been undertaken and the pitch has been fully retested and shown to satisfy the 'Community' category field test requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches*.

Note:

As a condition of allowing games and training activities to take place on a synthetic turf pitch the Rugby Football League reserves the right to test a pitch at any time. Any pitch found to be non-compliant might have its field test certificate removed until areas on non-compliant performance are rectified.

3 Field maintenance

The synthetic turf surface shall be regularly maintained in accordance with the surface

manufacturer's instructions. The maintenance programme shall be tailored to ensure the pitch satisfies the relevant performance requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches* at all times, taking into account the levels of usage being placed on the pitch.

The maintenance shall be undertaken/coordinated by maintenance staff that have attended a synthetic turf maintenance training course that is recognised by the Rugby Football League. Details of courses considered suitable may be obtained from the RFL Facilities Trust Manager Facilities Trust Manager (email: Carol.Doran@rfl.uk.com).

Super League and Championship category pitches

The Ground Staff responsible for maintaining the pitch shall complete a maintenance log showing what maintenance has been carried out on the surface and when. In addition immediately prior to a game and following any extensive training or other activities allowed to take place on the pitch the Ground Staff shall check the vertical free-pile height and infill depths of the synthetic turf surface using the procedures detailed in the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches*. Tests shall be made on a 10m grid across the pitch and in-goal areas and the results recorded on an official RFL maintenance record sheet. If the vertical free-pile height is found to be less than 75% of the height specified by the surface manufacturer or the infill depth is found to be less than 90% or greater than 110% of the depth specified by the surface manufacturer the Ground Staff shall undertake additional maintenance to rectify the defects and a further check made.

It is the responsibility of the stadium operator to ensure adequate time is allowed in their scheduling programme for the pitch to ensure such checks and any necessary maintenance are made.

Note: Gauges for measuring free pile height and infill depth may be obtained from Labosport Ltd (www.labosport.co.uk).

4 Logos and other markings

RFL competition rules for Super League and Championship pitches require them to be marked with sponsors logos, etc. Logos can either be painted onto the surface using suitable paints or by the use of synthetic turf inserts. Whichever method is chosen it must allow logos to be inter-changed as required for the various competitions in which sponsors logos need to be marked onto the pitch; practically this may favour the use of painted logos.

If painted logos are to be used they shall not result in any aspect of the performance of the synthetic turf surface falling outside the 'Stadium' category of performance as specified in the

Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches. Prior to painted logos being applied the combination of synthetic turf, infill, shockpad and paint shall be tested by an RFL accredited laboratory and shown to satisfy the skin friction, shock absorption, vertical deformation and rotational resistance requirements (under dry and wet conditions) of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches.*

If the logos are to be permanently marked by using synthetic turf insets they shall be manufactured from the same quality of synthetic turf carpet and infilled as the main playing area of the pitch and all yarn colours used shall satisfy the Resistance to Artificial Weathering requirements of the *Rugby Football League Performance and Construction Standards for Synthetic Turf Rugby League Competition and Training Pitches.* If a 'temporary' method of fixing inserts is used (Velcro strips or similar) they shall provide a joint that does not fail during normal playing conditions or adversely affect the performance of the playing surface.

4 IS A SYNTHETIC TURF PITCH RIGHT FOR YOUR FACILITY?

When considering the installation of a synthetic turf pitch the first step is to undertake a feasibility study to identify what you really want to achieve from your pitch; this decision process is a fundamental element in the success of the future pitch. You should challenge yourself to think about the future of your organisation and ensure that you, and your colleagues, share a common vision.

Ask yourself:

- What are the priorities from your Rugby League development plan? Will training be the main use or will you be looking to stage matches on the pitch too?
- What are the demands for the synthetic turf pitch in your area?
- What will your hiring fee structure be across the various times the facility will be open?
- Can the proposed hiring fees be afforded by the local community and will this provide sufficient funds for your sinking fund?
- How will your development affect the key policies of RFL development strategy's, e.g. have you taken advice from Rugby Football League?
- Dependent on the type of use, you must make your own informed judgement on the quality of the surface. This judgement can often be reached by visiting similar facilities in your area to seek information on best practice and to learn from their mistakes. This

guide also aims to provide you with independent information on the many aspects of an synthetic turf pitch that you will need to consider.

- Are you able to commit to the maintenance requirements of the surface? The maintenance of the surface is of vital importance if the pitch is to retain acceptable performance and be long lasting. It is therefore essential that this vital aspect of the pitch's management is not over looked.

When a synthetic turf pitch is to be used in RFL or other competitions a club should make their own risk assessment of whether long term compliance with the RFL competition rules is realistic given their individual circumstances. In particular the need to retain a specified level of performance verses the risk of deterioration through the higher levels of use and or inadequate maintenance often associated with community use need to be seriously considered.

5 Multi-sports use

Many synthetic turf pitches are used for more than one sport and this inevitably results in compromises in performance. In making such compromises it is important that the playing characteristics of the sports or the protection provided to players is not reduced to a point at which the surface fails to provide a satisfactory playing environment.

Football and Rugby Union can both be successfully be played on certain forms of synthetic turf that can also be used for Rugby League without a major impact on the playing characteristics of any of the three sports.

FIFA has published its *FIFA Quality Concept for Football Turf* which defines the playing qualities they consider necessary for high quality and community football. The Concept has two categories; the FIFA Two Star category is the higher grade and is intended for professional clubs wishing to compete or train on synthetic turf pitches whilst the FIFA One Star category is primarily aimed at organisations wishing to provide facilities for training and community use football. Guidance on the use of synthetic turf pitches in FA competitions can be obtained from the FA.

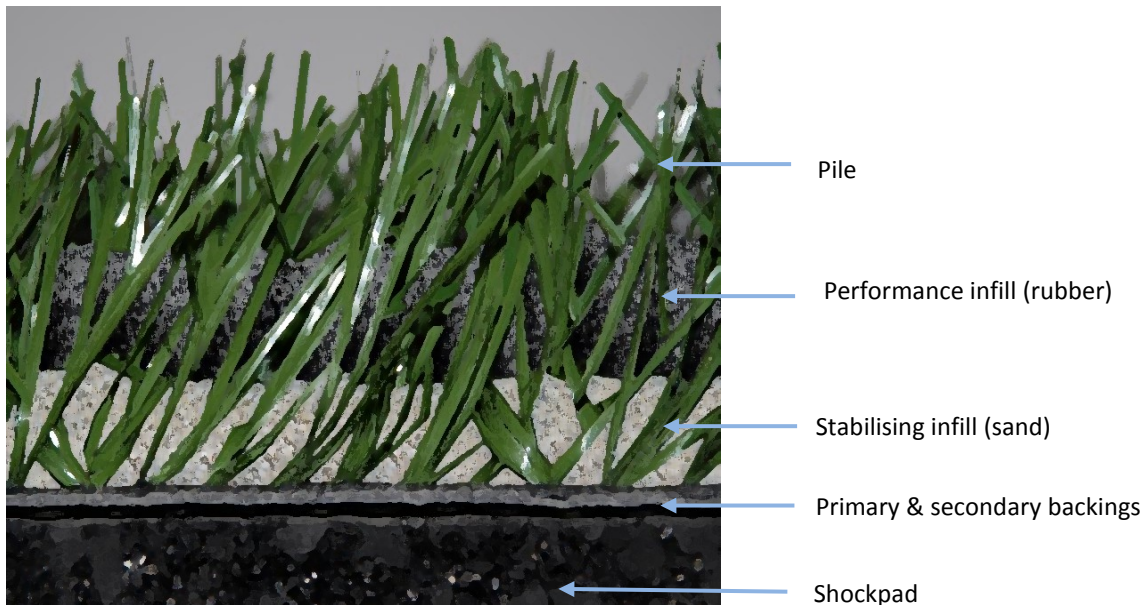
The International Rugby Board has also developed a standard for artificial grass Rugby Union surfaces used for competitive play (*IRB Regulation 22 – Artificial Playing Surfaces*). As the regulation is a law of the game any form of competitive Rugby Union can only be played on IRB Regulation 22 compliant fields.

As all three sports are based on natural turf pitches many of the characteristics each requires from a synthetic turf pitch are similar. The following table shows how the requirements of the various sports fit together.

← Firmer pitches	Natural turf performance		Softer pitches →
Rugby League	Rugby League Football	Rugby League Football Rugby Union	Rugby League Rugby Union

6 SURFACING OPTIONS

A synthetic turf surface is a complex piece of engineering that has to provide the correct playing and safety characteristics for the game whilst ensuring adequate durability. Drawing 1 shows a typical cross section of the synthetic turf surface.



Drawing 1 – principal elements of a synthetic turf surface

Synthetic turf carpets

The range and design of synthetic turf surfaces is expanding rapidly and the selection of the best product for any particular scheme can be difficult without specialist knowledge. Described below are the principal aspects of a synthetic turf carpet and some of the parameters often detailed by manufacturers in their trade literature.

Pile yarn is one of the most important aspects of the surfacing system as it influences the playing characteristics, durability and visual appearance of the pitch. Nowadays most synthetic turf carpets are manufactured with a pile made of polyethylene. This type of yarn provides a resilient and durable surface, whilst not being too abrasive to players when they fall or slide on it. Some

surfaces also include secondary yarns to help provide and retain the desired playing characteristics; these are often polypropylene or nylon.

The surface pile is either manufactured from fibrillated or monofilament yarns. Fibrillated yarns were originally developed for the earlier forms of sand filled synthetic grass and are manufactured from thin sheets of plastic that are slit and twisted to form thicker filaments that form the pile. Experience has shown that the abrasive effects of play can cause the yarns to split into increasing fine fibrils increasing the risk of poor foot grip, infill compaction and skin burns.

Monofilament yarns have become the standard for synthetic turf because of their enhanced durability and resilience. The yarns are manufactured as individual strands that are plied together to form the individual tufts. The number of plies can vary and is normally specified as the number of ends per tuft; the higher the number the denser each tuft. As monofilament pile yarns are produced in their finished state manufacturers are able to engineer an increasingly complex range of profiles in an attempt to increase the resilience of the fibre so that the tendency for the pile to flatten is reduced.

Pile length is the length of the pile; normally expressed as the height of the pile above the backing of the carpet, it is also sometimes expressed as the total length of the yarn forming the tuft (the two sides of the tuft); the height of carpet piles for Rugby League typically range from 55mm to 65mm.

Pile weight or face weight is the weight of yarn forming the pile; typically ranging from 900g/m² to 2,000 g/m². When comparing carpets of similar pile heights those with higher pile weights will normally be of a high quality, providing greater infill stability (less dispersion) and have longer services lives.

The synthetic turf carpet is produced in rolls that are normally between 3.5m and 4.5m wide. These are normally laid across the pitch for its full width although a roll may be laid along the either side of the pitch when in-laid touchlines are required. The rolls of carpet are joined together by either stitching or using adhesive joints where the two adjacent rolls of carpet are stuck to a backing film. Both methods are acceptable providing the joints are well made.

Play lines can either be painted onto the playing surface or be tufted and inlaid. Tufted lines are incorporated into the carpet during production; inlaid lines are cut into the carpet during installation; they provide permanent markings that reduce on-going maintenance costs, whereas painted lines give greater flexibility to the use of the area. When specifying the type of line markings required remember that any pitch that is to be used in Super League or Championship competitions should have all markings other than those specified for Rugby League applied in paint to allow their removal prior to competition matches.

Infill materials

The majority of synthetic turf surfaces are filled with particulate materials. These are normally either granulated rubber polymers or mixes of rubber and sand. The infill materials are used to support the pile of the carpet, to help it remain vertical, to contribute to the playing and cushioning qualities of the surface and to provide weight to ensure the carpet is held in place. The grading, composition and depth of the infill materials are therefore carefully selected by the manufacturer to ensure the combination of the carpet pile and infill materials gives the type and level of performance required from the surface.

An increasing number of rubber polymers are being used. The most common is styrene-butadiene rubber (SBR as it is more commonly referred to); the granules are black in colour and produced from recycled tyres. If an alternative colour is required a polyurethane coatings may be applied to encapsulate the SBR granules.

As the development of synthetic turf surfaces progresses manufacturers are engineering infills materials and profiles to enhance performance. A range of materials including vulcanised and non-vulcanised thermoplastic polymers (TPE and TPV) and Ethylene Propylene Terpolymer (EPDM) granules are now being used. As they are specifically manufactured from virgin stock material they may be granulated, extruded or moulded to have the required shape, size and colour for enhanced performance. In addition they can have flame retardant additives incorporated in their formulations to reduce their flammability; an important consideration for certain sites and in particular when surfaces are being laid indoors.

Several manufacturers are also now offering organic infills, based on coconut fibre and cork these infills are designed to provide a more natural playing surface. They do, however, require moisture to keep them at in their optimum condition and are likely to require replacement periodically through the synthetic turf carpet's life. In practice such infills are probably more suited for stadium pitches.

Shockpads

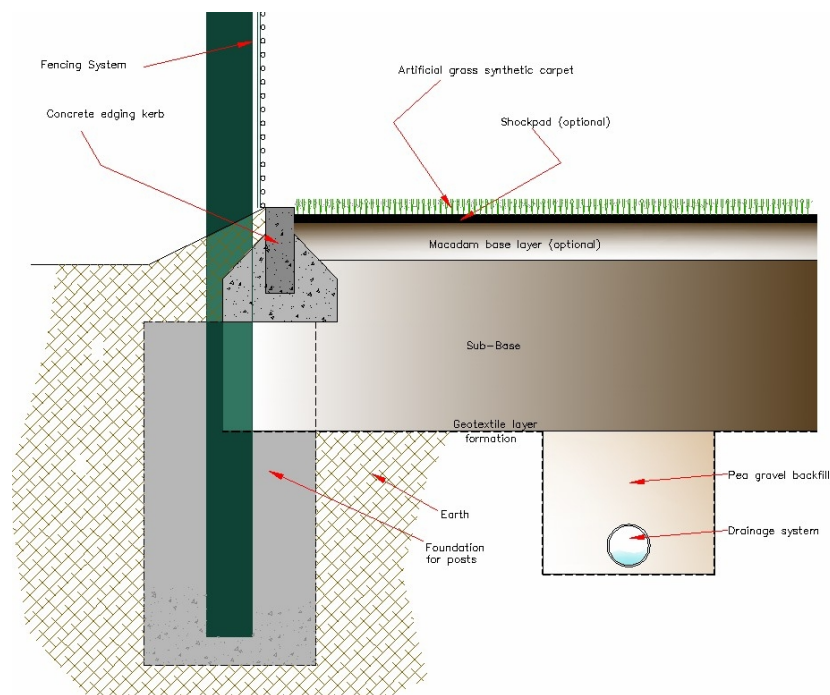
To ensure a synthetic turf pitch is able to provide the levels of protection considered necessary for the sport, it is likely to include a shockpad or elastic layer. Laid beneath the synthetic turf carpet they take many forms including polyurethane bound rubber mixes that are laid with a paving machine (often described as insitu laid shockpads) or factory produced panels or rolls that are manufactured from a range of materials including rubber granules, polyurethane foam, expanded polyethylene beads and recycled polyethylene foam.

Note: As an increasing number of sand filled synthetic turf pitches are being converted to long pile surfaces particular consideration needs to be given when an existing shockpad is to be retained

and incorporated into the new synthetic turf surfacing system. As the performance and durability of the synthetic turf surface is significantly influenced by the shockpad it is important that only systems incorporating shockpads with similar performance characteristics to the one being retained are considered for the resurfacing. To enable this to be achieved the properties of the retained shockpad must be measured on-site prior to quotations being sought (which will require the existing synthetic turf surface to be cut to allow access to the shockpad) so that contractors bidding for the resurfacing work will know what the performance of the shockpad is and design accordingly.

7 BASE CONSTRUCTIONS

The base on which the synthetic turf surface is laid is required to provide a stable and free draining platform on which the synthetic turf surface is laid; it should be capable of supporting and transmitting the loads placed on the surface during normal use and maintenance and provide adequate protection to the sub-grade from penetrating frosts. Drawing 2 shows a typical pitch construction including sub-base, drainage, fencing etc.



Drawing 2 - cross section showing typical construction of a synthetic turf pitch

The pitch should have a drainage system that is designed to remove surface water from the playing surface at a sufficient rate to prevent flooding and to ensure that excess water is not

allowed to build-up within the sub-base causing a reduction in its structural integrity. The drainage system will typically consist of a series of lateral drains laid beneath the pitch at between 8m and 15m centres, depending on site conditions. The lateral drains will connect into collector drains located on the outside of the perimeter edgings that will discharge into a suitable outlet. This will need to be identified (often before planning approval is granted) during the design of the pitch. Outlets can include storm water sewers, soak-aways and nearby watercourses. Whichever form is chosen permission is normally required from the relevant statutory body.

Most commonly bases for long pile synthetic turf pitches are now constructed from unbound graded free draining aggregates (coarser gradings in the lower sections, finer gradings at the top) typically installed to a depth of 300mm – 450mm depending on ground conditions.

If an unbound base is poorly constructed it can suffer from localised movement resulting in undulations that, in extreme cases, can affect the playing qualities of the surface. This has resulted in some contractors promoting the use of bound or engineered bases of porous (open textured) bituminous macadam, as commonly used for hockey pitches.

8 FENCING

Perimeter fencing is normally erected around community pitches to contain balls, to protect the playing surface from contamination and to help prevent unauthorised use and vandalism. Fencing heights vary, 3m is often used but this can increase to 5m where the site requires as many balls as possible to be retained within the pitch. Where site security and ball retention is not a serious issue or where an internal spectator compound is provided 1.2m high fencing with a top rail is often used to enable good spectator viewing.

The fencing is normally constructed from 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 balls hitting the fence than cheaper chain-link mesh. Steelwork should be galvanised to minimise premature corrosion and may be plastic coated to improve its appearance.

Access gates should open outwards to ensure the safety of players. At least one pair of double gates should be provided to allow maintenance and emergency vehicle access.

9 FLOODLIGHTING

In order to maximise the use of the pitch most are floodlit. Lighting of full size pitches is normally achieved by a number of lamps mounted on columns positioned along the sides of the pitch. Typically eight columns, fifteen or sixteen metres high, are used.

As many league and cup competitions specify the minimum level of lighting they require it will be necessary to determine the competitions that the teams using the pitch will compete in and design accordingly. Guidance on lighting levels may be obtained from the RFL website <http://rflfacilitiesrust.co.uk/home>.

When designing a floodlighting system is important that an assessment of the available power supply is made to determine if adequate capacity is on hand, as bringing a new supply to site can increase costs dramatically. The total installed power requirements for a full size pitch is likely to be in the order of 35 to 40 kilowatts.

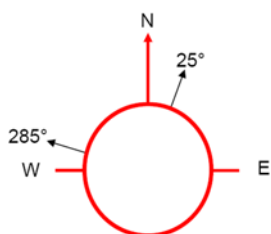
10 WHERE IS THE BEST LOCATION FOR A PITCH?

The design and cost of a new synthetic turf pitch will be greatly influenced by the site on which it is to be built and it should be recognised that some sites are probably not cost effective to develop. Factors that will influence the construction costs include topography, access, drainage, availability of an adequate power supply (for lighting) and most importantly ground conditions.

Before commencing the design of the pitch the design team will require as much information as possible about the site and its surroundings. It is therefore essential that adequate resources are budgeted at an early stage of a project as this greatly reduces the risk of unforeseen problems (and increased costs), during, construction or even later. Of greatest importance is an understanding of the ground conditions, as the largest risk of unforeseen problems and additional cost normally occurs here. A specialist geo-technical survey should be undertaken where boreholes or trial pits are excavated to allow a detailed examination of the substrata across the proposed site.

Ideally a pitch should be located:

- close to changing accommodation and other support facilities;
- on relatively flat ground - to reduce construction complexity and costs and to prevent contamination of the playing surface from run-off from adjacent banking, etc;



so the playing direction is approximately north (between 285° and 20°) / south, to minimise the effect of a setting sun on the players, although the inability to achieve this orientation need not preclude the construction of a pitch;

- 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;
- where players, spectators and maintenance equipment do not have to cross natural turf areas, as mud, debris and other contaminants will contribute to the deterioration of the playing surface;
- away from trees as roots and leaf litter can cause on-going structural and maintenance issues.

11 Pitch dimensions

A pitch comprises the area within the field markings in-goal areas and side run-offs (the side areas beyond the markings which are provided to ensure players do not injure themselves by running into fencing, hoardings and other obstacles). The RFL has established recommended pitch sizes to ensure facilities are suitable for all potential levels of use, categories of competition, etc. These, along with the recommended run-offs, may be found on their web site <http://rflfacilitiestrust.co.uk/home>.

12 PROJECT DESIGN TEAM

Having decided a synthetic turf pitch is right for your organisation you are committing to a large capital investment that should be supported by thorough design and planning if it is to be successfully built and operated. Experience shows the design, specification and project/construction management of the pitch is best undertaken by people with specialist expertise. A typical project team is likely to include:

- Design consultant
- Geo-technical engineer
- Project manager / quantity surveyor
- CDM Coordinator (as required by the Construction Design and Management Regulations)
- Sports surface test laboratory

Project team members should be appropriately qualified in their respective disciplines, be independent of suppliers and manufactures and have adequate professional indemnity insurance

cover. Each specialist should be carefully selected and should provide references from previous relevant engagements.

Quality monitoring during construction

To ensure the objectives of having an synthetic turf pitch that has the right playing characteristics for the game, is safe to use and at the same time is able to withstand rough treatment and remain operational for a realistic period of time are achieved it is essential that proper quality assurance procedures are applied throughout the construction process. Independent site inspections should be undertaken throughout construction with particular attention being paid to the completion of each key stage. A typical schedule of inspections would include:

Stage of construction	Inspected for:
Formation	<ul style="list-style-type: none"> • profile and gradients • adequate compaction
Drainage system	<ul style="list-style-type: none"> • channel spacings and falls • permeability of infill
Edgings	<ul style="list-style-type: none"> • design levels • haunching and line
Base	<ul style="list-style-type: none"> • construction depth • grade • compaction • permeability • surface regularity
Shockpad	<ul style="list-style-type: none"> • construction depth • permeability • surface regularity • tensile strength – laboratory test • shock absorption
Synthetic turf surface	<ul style="list-style-type: none"> • joints • joint strength – laboratory test • infill application • carpet characteristics – laboratory tests • infill characteristics – laboratory tests

The appointment of a project team is likely to incur professional fees, some of which may have to be paid early in a project and possibly before any external funding awards have been secured. Adequate budget allowance for professional services should therefore be made at an early stage of a project. Most external funding agencies, however, consider the fees incurred by the use of professional advisors as a justifiable part of a project's cost and will allow them to be included in funding applications; indeed many see the use of specialists as a way of ensuring a pitch is built to the required standards and within budget.

13 PROCUREMENT

There are various forms of specification that can be used when inviting contractors to bid for the construction of an synthetic grass pitch. Most synthetic turf pitches are, however, designed and procured using the design and build approach where a number of contractors are invited to submit their proposals for the design and construction of the facility. In this type of contract the customer needs to prepare a design brief (or Employer's Requirements document) that adequately describes what is required. The use of a specialist architect or consultant to prepare such a document is strongly recommended.

14 CONTRACTORS

As a result of the expansion in the market for synthetic turf pitches there has been a corresponding increase in the number of contractors offering their services as constructors of such facilities. Not surprisingly, the large number of contractors operating includes companies of a wide range of size, structure and ability, from which a choice must be made for any project. Selecting the correct company is crucial if your pitch is to meet your expectations.



The Sports and Play Construction Association (SAPCA) is the UK trade association for the sports facility construction industry. SAPCA represents most specialist constructors, professionals, manufacturers and suppliers of sports surfaces and related products. Details of SAPCA and its members may be obtained from their website <http://www.sapca.org.uk>.

15 SURFACE MAINTENANCE

The maintenance of the synthetic turf surface is of vital importance if the pitch is to retain acceptable performance and be long lasting. The manufacturer's guarantee will also usually be conditional on the recommended maintenance requirements being carried out with reasonable diligence and failure to make adequate allowance for the required maintenance equipment and training may result in a field not being certified to the relevant RFL standard.

Prior to selecting a surface the manufacturer's advice must be sought on the maintenance equipment to be used and how regularly the maintenance works should be carried out given the proposed programme of use; if you cannot follow the recommendations you should not select the surface.

You should also look to agree how often the manufacturer/installer should return to site to undertake perform more major rejuvenation works to ensure the infill is evenly spread over the

site to protect the fibres. This maintenance agreement will help protect your warranty provided by the surface manufacturer. Many installers offer a periodic (quarterly) inspection service as part of their after-sales. This should be welcomed and encouraged so any shortcomings in maintenance are identified before they have a detrimental effect on the playing surface.

Three types of maintenance are normally required:

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 more fibrillation and matting of the carpet's pile with a deterioration in performance
- The localised topping up of infill 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

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 two hours per session for a full size pitch.

Routine periodic maintenance

- Relieving compaction of the particulate infill to ensure consistent ball and foot response.
- Removal of any moss or weeds that germinate within the surface, particularly around the edges of the pitch where it is harder to get mechanical brushes into.

The relieving of compaction will require specialist equipment and is likely to be required between one and four times per year, depending on usage. Where a pitch operator has a number of pitches they may wish to purchase the necessary equipment, whereas an operator with only one facility may find it more cost effective to enter a maintenance contract with a specialist company.

Rejuvenation

Even with good levels of maintenance dirt and fibre debris (resulting from the wearing of the carpet pile) will eventually become trapped within the fill material. At some stage during the surface's life it will probably be necessary to remove the contaminated fill and replace with new material before

serious problems of compaction (leading to a harder playing surface) and a reduction in porosity (eventually causing flooding on the surface in wet periods) start to occur.

Maintenance costs

The maintenance of synthetic turf pitches should only be undertaken by fully trained and competent persons; at some sites these are volunteers, at others ground-staff are employed. Based on 2011 Institute of Groundsman recommended salary rates and an estimate of the likely levels of maintenance required for a floodlit community / school pitch it is suggested that a budget of £11,000 to £13,000 per annum be allowed for regular and routine periodic maintenance. For pitches subjected to lower levels of use costs reduce to around £4,000 per annum. As a guide 10 hours match play (30 players over an area of approximately 6,500m²) will typically result in one hour's maintenance activity on the pitch.

Whilst small areas will take less time to maintain, the concentration of play may require maintenance at a greater frequency.

Rejuvenation processes are not cheap (up to £35,000 plus VAT for a full size pitch) and adequate allowance should be made from day one of the pitch's life.

Maintenance logs

The installation contractor or surface manufacturers should provide a maintenance register or log when the pitch is handed over following installation. The register is a working document that should be completed each time any form of maintenance is undertaken. This enables the pitch operator and the contractor/manufacturer to check that the correct levels of maintenance have been carried out if deterioration in the performance of the pitch or signs of premature or excessive wear occurs.

Floodlighting

The maintenance of the floodlighting system is also important if it is to continue to meet the performance specified at the design stage. Maintenance will include routine work on all the associated electrical services, cleaning of fittings and the correct adjustment to maintain the 'aiming angles' of the lamps. Many floodlighting contractors now offer annual maintenance contracts and these are worthy of consideration.

16 REPLACE FUNDS – SYNTHETIC TURF SURFACES

Project co-ordinators should be aware of and plan for the full life costs of the pitch and supporting infrastructure from an early stage. Information should be sought regarding the on-going costs of routine maintenance of the chosen playing surface, together with the life expectancy and cost of

replacement at the end of the surface's useful life. The manufacturer of the surface will be able to provide guidance on the likely life of the surface - provided it is properly maintained – and its replacement cost. Similar information should also be obtained in respect of the floodlighting and fencing.

A sinking fund should be established as soon as the new pitch is brought into use to ensure that sufficient funds are available to replace the surface when it reaches the end of its life. As the cost of replacement is in the future, it will be necessary to save the amount of money required at that future date, not today's cost. This means that it is not possible to take the today's cost and divide it by the number of years until replacement is due. A more complex calculation that takes into account compound interest to the replacement date needs to be used.

Current estimates for the resurfacing of a full size pitch (including removal of the existing surface and disposal of the surface and fill) suggests a budget of between £150,000 and £180,000 plus VAT is realistic. Based on 5% inflation a sum of £180,000 will equate to £293,202 in 10 years' time. To achieve this figure, and assuming a compound interest rate of 5%, a monthly contribution of £1,924 (£23,311 per annum) is required every month from the first month of the pitch's life.

17 OTHER SOURCES OF USEFUL INFORMATION

Synthetic turf surfacing options

Selecting the Right Artificial Surface for Hockey, Football, Rugby League, Rugby Union

www.sportengland.org.uk

FIFA Quality Concept for Football Turf

www.fifa.com

IRB Regulation 22 – standard relating to the use of Artificial Rugby (Union) Turf

<http://www.irbplayerwelfare.com>

Synthetic pitch construction

Guide to the Construction and Maintenance of Synthetic Turf Sports Pitches

www.sapca.org.uk

Pitch fencing

Guide to the Construction and Maintenance of Fencing Systems for Sports Facilities

www.sapca.org.uk

Floodlighting

www.sportengland.org.uk

www.sapca.org.uk

Maintenance of artificial grass surfaces

www.sapca.or.uk

Trade associations

European Synthetic Turf Organisation (ESTO) (www.theesto.com)

Institute of Groundsmanship www.iog.org

Sport and Play Construction Association www.sapca.or.uk