

SYNTHETIC FIELDS

A guide to synthetic surfaces for Football



**NORTHERN
NSW**
FOOTBALL



**FOOTBALL
NSW**

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Football NSW Limited has produced this Synthetic Fields Guide to provide general guidance to clubs, associations and zones in NSW to assist them with the selection, construction and maintenance of synthetic fields. The contents of this Guide should not be used for any other purpose or reproduced or communicated without our consent. The information contained in this Guide has been sourced from a third party (Synthetic Field specialist Martin Sheppard), Football NSW and Northern NSWFL makes no representation or warranty about the accuracy or completeness of the information contained in this Guide. You should not rely solely on the information in this Guide and should make independent inquiries, including seeking professional advice. To the extent permitted by law, Football NSW and Northern NSWFL disclaims any responsibility and liability for any cost, expense, loss or damage incurred by any entity or person relying on the information contained in this Guide.

Foreword

In 2017, Football was identified as Australia's most popular team sport participated by the Australian Sports Commission's AusPlay survey (October 2015 – September 2016 results). With this popularity come challenges for facilities and specifically playing fields and their ability to satisfy the club and recreational demand for playing fields.

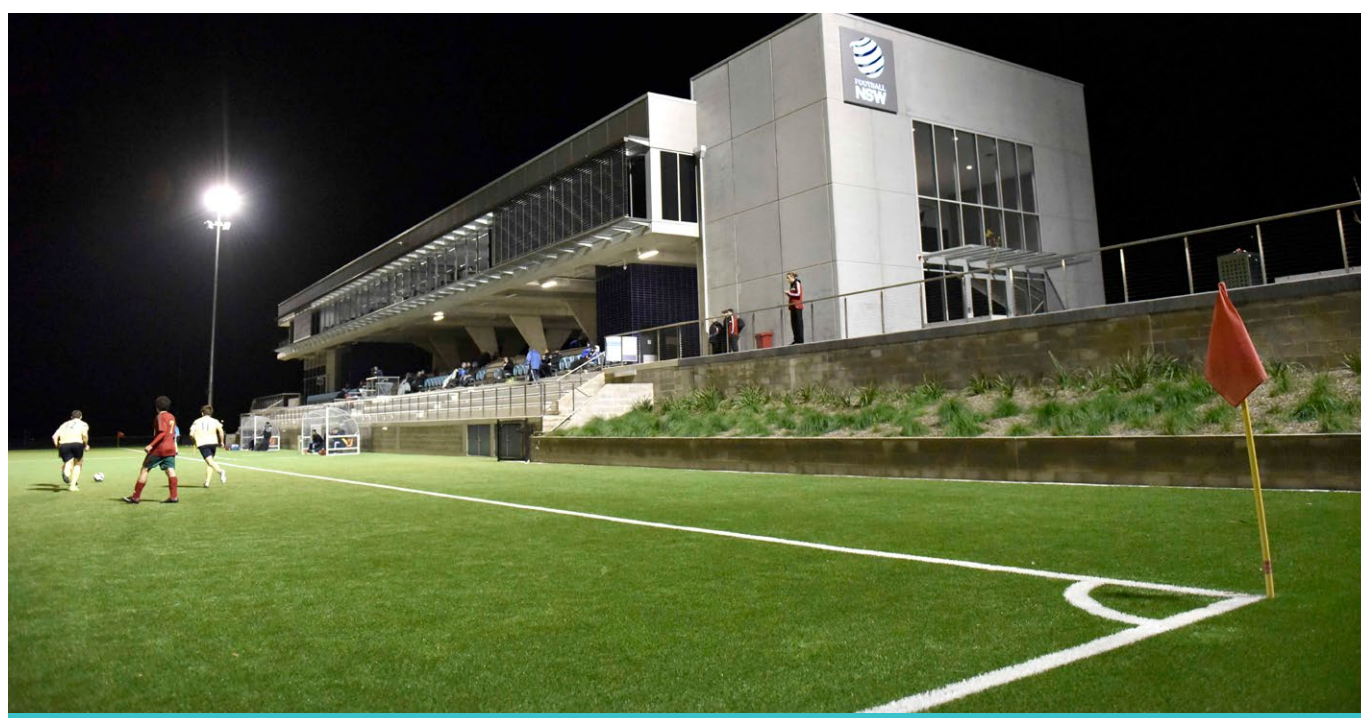
The growth in demand combined with the weather challenges of too much or too little rain, is placing greater pressure on local government and football associations to meet the needs for training and competition, while also trying to balance the sustainability of natural turf fields.

Over the past five years an estimated 35+ synthetic fields have been installed in NSW, which are allowing clubs, associations, zones and local governments continued usage, far in excess of any natural playing field playing capacity. Increasing playing capacity from 20-25 hours per week on natural grass to over 60 hours is having a significant impact on NSW being able to cope with the growing demand for the game.

The science and technology used in Synthetic Football Turf systems is evolving and improving continually and the performance and durability outcomes are providing additional benefits to the sport. With this new technology FIFA has introduced new Quality Performance Standards and these systems are now just being installed in Australia. This updated Guide reflects these new standards and also addresses issues, which have arisen as synthetic surfaces become more prominent.

The process of planning and construction of synthetic fields can be complicated and while this is not a "how to" Guide it is designed to streamline the procedure and help clubs engage with councils to choose the most appropriate synthetic surface for their particular needs and appoint the most suitable contractor for construction and ongoing maintenance.

This Guide was compiled by Football NSW and Northern NSW Football in association with Synthetic Field expert Martin Sheppard, Managing Director of Smart Connection Consultancy.



Introduction

The popularity of Synthetic Football Turf, as it is commonly known, has grown over the past 30 years or so, with FIFA now holding various junior and senior World Cup Final competitions and matches on synthetic fields, including the 2015 FIFA Women's World Cup in Canada.

Football NSW (FNSW) and Northern NSW Football (NNSWF) as the State's peak body for the game has embraced the technology and promotes it as a solution for some environments, where usage is greater than natural grass fields can cope with.

With investment by local and state government, the education and sports sector, there will be approximately 150 synthetic football fields in Australia by the end of 2017, with NSW accounting for 60 of those.

This Guide aims to provide the Football Family in NSW with an explanation of the importance of synthetic technology and how it works.

"Most countries around the world will play on artificial turf one day because it can be used 24 hours a day, seven days a week"

Evolution of Synthetic Football Turf

The technology has evolved significantly since 1964 when the First Generation turf, which was knitted nylon carpet with foam backing, was introduced for indoor Gridiron in America, at the Houston Astrodome in Texas.

The Second-Generation carpet promised to be more aligned to 'natural turf' with sand replacing the soil and 20-35mm of tightly packed polypropylene blades of grass being used which looked similar to natural grass but didn't perform like natural grass.

The 1980's version also had some drawbacks including:

- Playability – the sand infill and yarn combination didn't let the ball have the same playing characteristics as on natural turf. It bounced unpredictably and the roll was much faster; and
- Safety – the friction on skin was significant and caused 'skin burns' which then developed into wounds if not treated.

The durability of this second generation Football Turf for community football pitches (5-a-side facilities) was excellent and allowed many more people to play the game. In the UK, 5-a-side football had larger participation rates than 11-a-side, and so this had a positive outcome in the UK.

Four English professional football clubs invested in synthetic turf in the 1980's: Queens Park Rangers (Loftus Road), Luton Town (Kenilworth Road), Oldham Athletic (Boundary Park) and Preston North End (Deepdale).

At the end of the 1980's the European governing body for football, UEFA, ruled that professional level games should not be played on synthetic turf.

In the 1990's the major manufacturers of Synthetic Football Turf understood the benefits the technology

could offer to the community and elite sport, but could not convince the world's sports governing bodies by themselves. In the 1990's FIFA made it clear that the playability and performance needed to reflect the standards of natural turf.

After much research, the end of the 1990's saw a new generation turf, using a softer yarn, polyethylene, with rubber granules as the key infill component and sand now used more as ballast, so that the carpet didn't move.

In the past decade, the sophistication of Synthetic Football Turf has been driven by FIFA's performance standards focused on aligning the playability of natural turf with the durability needed for the community playing capacity and climate challenges. This has resulted in the emphasis on technical development being based on:

- Infill – to ensure ball, boot and player interactions play as a natural field;
- Yarn – to reflect blades of grass, being designed to stay vertically upright and soft on players skin; and
- Shock pad – introduced to provide a safer and more consistent playing surface.

The result is that synthetic football fields are now being embraced by both community teams and elite players, both in Australia and globally.

Football Embraces Synthetic Turf

FNSW and NNSWF is committed to developing the game at all levels and appreciates how the use of Synthetic Football Turf can assist local clubs, associations and local government meet the growing demand.

Benefits and Considerations of Synthetic Football Turf

Football NSW has installed two Synthetic Football Turf fields at its redeveloped home of NSW Football at Valentine Sports Park, Glenwood. Northern NSW Football also facilitated a joint venture at Speers Point with Lake Macquarie Council.



Together with Football NSW's Stadium Technical Requirements and this Guide to Synthetic Fields, Football NSW is committed to providing support and advice to all who are responsible for the planning, management and provision of the game in NSW.

Benefits

The key reasons given for installing a synthetic surface for sport and recreational use are:

- **Climatic:** Under drought and water restrictions or excessive rain conditions, it can be difficult to maintain a safe and suitable natural grass surface. Synthetic sports surfaces in general are not affected by reduced or increased rainfall;
- **Usage:** There is a limit to the hours natural turf can be used before there is a significant impact on surface condition. A high quality natural turf surface may only withstand use for up to 20 hours per week before it starts to deteriorate. Synthetic surfaces can sustain significantly higher use than natural grass with 60 hours plus per week as an acceptable expectation;
- **Maintenance:** Maintaining a natural turf surface can be time consuming, expensive and generally requires a qualified person to do it. Synthetic surfaces require lower ongoing maintenance than natural turf surfaces;
- **Consistency and quality of play:** Synthetic surfaces provide a consistent and safe surface all year round for all sports to play on, improving the quality of performance for each sport compared with natural playing surfaces;



Melwood Oval, Forestville

- **Health:** By allowing play on the surface more often and under safer conditions, it enhances physical health of participants; and
- **Club sustainability:** with the sustainability of many club's dependent upon their ability to coach and train juniors most evenings on the field and to provide a kiosk service off the field on match day to generate income, the ability for synthetic fields to have next to no cancellations of fixtures should be a benefit to all clubs.

Community Perceptions

As synthetic surfaces are embraced by the sporting community for their benefits, others in the community are concerned about the technology, due to misinformed media coverage. The key concerns that are raised are around:

• Player safety and injuries

The perception of greater injuries on synthetic turf is often linked to historic issues dating back decades to earlier generations. This perception is not accurate when comparing it to natural turf and this has been demonstrated through numerous studies by FIFA's own Medical Centre, UEFA and various US Department of Health studies.

The FIFA's Women's World Cup (2015) in Canada had less injury rates than previous World Cups on natural grass. The trend has emerged from the F-MARC data that shows a slight decrease in the number of injuries per match over the past three FIFA Women's World Cups.

These results are based on information submitted by team doctors immediately after each match. Further information is available on the FIFA Women's World Cup™ [technical report](#).

The health and safety of all sports facilities is a concern to both FNSW and NNSWF, asset owners and sports program providers. This is why Football NSW and NNSWF has developed its [Stadium Technical Requirements](#) to ensure that the facilities used to play football at all levels can meet the needs of the players, officials and other stakeholders. As a result, there tends to be a sophisticated decision-making process to minimise the potential risk to players.

At times, there is a perception that if the surface is not natural grass, it is not safe. In Australia, local community groups have expressed concern at the prospect of natural grass being replaced by synthetic surfaces.

• Surface playability

FIFA has for nearly 20 years been at the forefront of developing performance standards linked to natural turf standards from the best quality fields at stadiums and grounds, to ensure that the benchmarks they are looking for are achievable. What may not be understood by the broader community is that if many community level natural grass surfaces were tested to the same rigour as synthetic sports turf surfaces, they would not pass the performance criteria that are set for synthetic sports turf. Therefore, synthetic sports turf is far safer than most heavily used community playing fields.

FIFA commissioned a number of Pro-Zone Studies to study the surface playability comparisons between natural and synthetic turf. These were conducted at a number of UEFA Cup, Champions League and Dutch League games, as well as at the 2007 FIFA U-20 World Cup. The findings revealed that "synthetic turf does not dramatically affect the pattern of the football match, and the collective data reveals clear similarities to that of tournament games played on natural grass."

Providing sport has performance criteria that addresses playability and safety standards, this will ensure that as long as the pitch is adequately maintained, there should be no issue with confidence in safety levels.

Football NSW and NNSWF (NSW Facilities and Advocacy Unit) are therefore very keen to encourage all local governments, schools, clubs and associations to ensure that the fields being installed meet the performance standards that FIFA has developed to ensure that the surfaces are both safe and achieve the playability standards needed.

• Health risk from infills

To date, independent studies have shown there is limited health risk, if any, of playing on surfaces with recycled rubber (SBR). The community may have a perception that as some tyres are made from chemicals that have been shown to cause cancer, that they or their children would be more susceptible to contracting cancer themselves. What is critical is exposure (skin contact, inhalation and ingestion etc.) and the potential dose someone may be exposed from.

The latest research from Washington State Department of Health (April 2017) stated in their research into the number of soccer players with cancer in Washington, USA: “The available research suggests exposures from crumb rubber are very low and will not cause cancer among soccer players. The Washington State Department of Health recommends that people who enjoy soccer continue to play regardless of the type of field surface.”

A full evaluation of all the recent research studies (36) has been completed in the development of the [Smart Guide to Synthetic Sports Fields Rubber Infill](#) (5th July 2017: Smart Connection Consultancy), which is available

“There is a common perception that there are more sports injuries on synthetic than on natural turf athletic fields. Many factors influence the rate of sports injuries, including the type of playing surface. The many kinds of synthetic turf surfaces and changes in the turf products over the years complicate the assessment of how the playing surface affects injury rates”.

New York State Department of Health

to all free of charge. Martin Sheppard answers the 13 most often requested issues that the community asks, directly with evidence.

• Environmental risks

There has been significant research globally on the impact of recycled SBR on local ecosystems. These research projects including those representing the California Environmental Protection Agency, the Norwegian Institute of Public Health, the French National Institute of Environment and Risk, and Auckland Council, all have similar conclusions.

The conclusions are best summarised by the Swiss Study by the Ministry of Environment, Traffic, Energy and Communications. The study was on the Environmental Compatibility of Synthetic Sports Surfaces which explored



Seymour Shaw, Miranda

the secretion of synthetic surfaces from disintegration by UV radiation, mechanical destruction by abrasion, and diffusion of ingredients and washing off by rain water.

The testing was in a controlled environment with rain washing through the synthetic and natural turf systems over a two-year period then collected and measured for the secreted substances. The report summarises there is no risk for the environment from Poly Aromatic Hydrocarbons (PAH's) or heavy metals including Mercury, Lead, Cadmium, Chromium, Zinc, and Tin, which were all lower than the required European safety levels.

• Heat Concerns

The temperature of synthetic surfaces does rise significantly more than natural turf, especially on days where the temperature is above 30°C and there are no clouds in the sky to shelter the sun's rays.

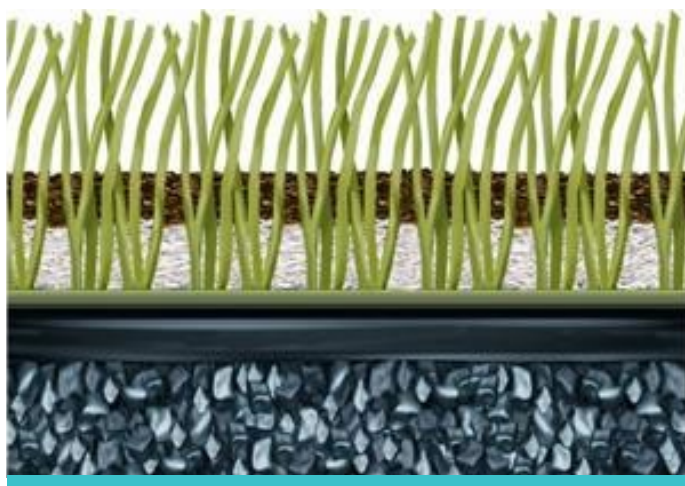
FIFA has recognized this and developed a heat classification system within the new 2015 Quality standards with five categories, scoring 1 to 3 with half scores in between, one being the coolest and three the hottest. The coolest would typically reflect a moist surface, such as a sand based hybrid surface and the hottest a black rubber infill. The suppliers are using cool grass technology, mixing organic components and liquid applications to reduce the heat at the surface. This will continually improve over the next few years as the technology develops.

Reference should always be made to the [Football NSW Hot Weather Policy](#) to guide the clubs, associations and local government on the heat circumstances on any specific day, irrespective of the type of surface, natural or synthetic.

The Synthetic Football Turf System

Introduction

A synthetic sports turf system has several components that have to be in place for fields to play in accordance with the performance stipulated by the sport. Each manufacturer has its own system, but the latest generation of synthetic fields generally comprise a synthetic grass carpet containing a layer of stabilizing sand, topped with in-fill, which is usually rubber but can also include organic matter. This is then laid on a shock pad – if the system uses one – and then onto a suitable base, which is crucial for the overall quality and lifespan of the system. This can comprise a pavement constructed upon a sub-base.



Source: FIFA quality concept for Football Turf

Performance System

Third Generation Football Turf

The third generation Football Turf yarn is normally made from either a polyethylene or polypropylene fibre, which is extruded from polymers in a manner that allows them to be strong enough to stand upright, which is assisted with infill, similar to natural blades of grass. The balance between thickness (normally over 300 micros) and softness is critical to achieving a durable and playable finish. There are a range of yarns that are on offer in systems, including:

- **Monofilament fibre** – a single length or blade which tries to replicate that of a single blade of natural grass. A grass with this yarn would normally have a greater amount per square meter. It is also renowned for staying upright longer and being more durable.
- **Tape and Fibrillated Yarn** – The yarn is produced in a sheet (slit-film sheet) then cut to the width desired, so the texture has more uniformity than the single blade of the mono-filament yarn with the superior turf bind and very durable. There is also an option for the tape to be fibrillated which can work with a monofilament system.
- **Hybrid system** – Some manufacturers are offering a combined yarn system that offers the aesthetics and durability of a monofilament yarn with the superior tuft bind and economies of a fibrillated yarn.

The yarn is made in various lengths depending upon its use and type of sport. Indeed, over the past five years the trend has been for facilities to have a yarn length between 50 and 60mm, with fields with infill under 50mm being more prone to need additional maintenance as the infill disperses quickly from key areas and this impacts performance. If the field has 70mm of infill it can sometimes feel as though the surface is moving, so a system that has a range of 50-60mm is recommended.

The use of hybrid surfaces combining both a monofilament and fibrillated tape allows for additional durability and the entrapment of the infill which reduces infill splash with the ball and seems to reduce heat in certain systems by encapsulating the black rubber thus reducing the back area to keep the heat.



Football NSW new Home of Football includes two synthetic fields

• Infills

The infill for football fields assist the performance of the whole grass system, with the aim of replicating natural turf growing mediums in a natural pitch where the grass/synthetic yarn is held upright. The infill can be compiled from sand, rubber (either recycled or virgin) or organic infills.

The amount of fill is normally determined by the manufacturer when they consider the length of the grass yarn, the performance outcomes, and use of shock pad and purpose of the field. There are five options with various combinations as follows:

- i. **Crushed Rubber (SBR)** – The most popular and most cost-effective choice in the Asia Pacific region, derived from recycled motor vehicle tyres. The crumbed rubber is normally 0.5mm-2mm in size. The colour is black, which means that there is tendency to retain heat compared to lighter infills.
- ii. **Sands** – Most surfaces will use silicon sand, which is rounded, non-toxic and chemically stable, and many companies use this as ballast and have the rubber on top. By itself it can be hard on the players over time.
- iii. **Virgin Rubbers** – There are a few options in this space including:
 - **TPE** – Thermo Plastic Elastomer compressed into shape, including long life and can come in many colours;
 - **TP** – A similar compound to TPE with similar characteristics; and
 - **EPDM** – Made from three monomers; ethylene, propylene and diene and normally in light green or light brown in colour.

The virgin rubbers and plastics are odourless and should be tested against the German standard ZEK 01.4 – 08, and also EN 71.3 Table 2 Category III which ensures that there are no heavy metals in them that if digested would cause a problem. This need to be UV tested before installation in Australian conditions as some cheaper versions lose their colour quickly.

- iv. **Organic** – There still seems some experimentation on this within the Australian climate with the use of water cannons to keep the infill moist, which precludes it from many open parklands. Certainly, this would be the optimum surface for heat reduction, as the organic infill is damp. The downside is that some organic mixes (e.g. coconut husk/cork) are light and with heavy rain, cause floating effects. The breakdown of organic fibres, increased likelihood of weeds, and need for substantial watering means a big question mark remains over this option for Australian local governments.
- v. **Combined Options** – Some suppliers are being imaginative and balancing the desires of some clients to be environmentally conscious and are applying a sand/SBR mix and a 'top dressing' of either virgin rubber or cork. This offers a great outcome at an affordable investment.

• Shock pad

The shock pad is an elasticated layer (E-layer) between the pavement base and the synthetic grass carpet. It is used by many suppliers to provide a degree of comfort, meet sports' requirements for critical fall height and extend the life of the pitch.

The types and thickness of shock pads need to be considered as part of the overall synthetic surface system. This is to ensure that the important requirements of international sports standards regarding shock absorption, energy restitution and vertical deformation are met. There are two kinds of shock pads:



1. Pre-fabricated Shock pads

There are a number of products on the market, including 5m roll out sheets or matting (2m x 1m) with interlocking functions.

2. In-situ Shock pads

This surface infill mix comes in a variation of thickness between 35mm and 10mm and consists of a polyurethane binder mixer combined with rubber crumb (SBR) or shredded rubber (e.g. soles of training shoes). The mix needs to be perfected with the infill for the system to be optimised.

The European Synthetic Turf Organisation (ESTO) issued the outcomes of a thorough research project that recommends that shock pads should be used when there is any doubt that the maintenance will not be kept up with usage. Due to many fields in Australia being in the open domain of parklands which encourages even greater use, it is recommended to have a shock pad.

• Durability Considerations

The durability of the field should be considered for high wear areas, such as the penalty area, entrance through gates, linesmen areas etc. The suppliers should be asked how they can ensure that the durability of these areas can sustain the usage and even ask for additional guarantees for those areas. Also request what additional maintenance can be embraced to maximize their life expectancy. It is worth stating the numbers of hours of use the field will expect to receive, the intensity and type of footwear, as all of these components can impact on the Synthetic Football Turf System that will be offered.



Civil Engineered Solution

• Pavement

It is critical to ensure that the sub-base and pavement is designed by a civil engineering specialist so that it can support the Synthetic Surface System. The design should be based against data from the location/field inspections including an expert geotechnical report, topographical survey, drainage study etc.

The focus of the sub-base and pavement base design must be able to achieve the following:

- Support the vehicle load during the construction, maintenance and replacement phases;
- Integrate with the synthetic surface to ensure that the sports' performance criteria is achieved;
- Support the load on the pitch once in use, including players and maintenance machinery to ensure no negative deformation of the surface; and
- Protect the surface from other sub-grade movement or water.

• Drainage

Drainage is critical to the success of a synthetic turf system, and any system that does not have an engineered solution which meets the sport's standards for porosity should not be considered. The two most common bases are vertically draining and shaped, horizontal draining bases.



Football Turf Standards

FIFA Quality Standards

To ensure that the quality of Synthetic Football Turf is consistent across the globe FIFA developed the FIFA Quality Concept in 2001 and it is regularly modified to meet the latest needs with the latest Quality Manual published in 2015. FIFA Quality Concept has two standards, which were renamed in the new 2015 Quality Manual.



FIFA QUALITY

Combining a stringent regime of durability, resistance, safety and performance tests. Pitches that are awarded the FIFA QUALITY mark fulfil the specific requirements for recreational, community and municipal football, with typically **40-60 playing hours per week**.



FIFA QUALITY PRO

Pitches with the FIFA QUALITY PRO mark are specifically tested to mimic the high performance and safety requirements for professional football for a typical usage of up to **20 playing hours per week**. There are stricter requirements for international match pitches (e.g. size of pitch, no logos etc.)

These two 2015 standards replace the older FIFA 1 star (FIFA QUALITY) and FIFA 2 star (FIFA QUALITY PRO) fields. The retesting of a FIFA Quality Pro is every 12 months compared to 36 months for the more durable FIFA Quality mark.



FNSW and NNSWF Facilities & Advocacy Unit stipulates that all synthetic fields used for elite competitions must be FIFA approved and this standard is also recommended for grassroots football.

FIFA Preferred Producers and Licensee Programs

FIFA has developed a two-tier accreditation program for manufacturers and suppliers of football turf to the industry to ensure that the client is purchasing from a reputable supplier.

• FIFA Licensee

The two-tier system entry level is known as a FIFA Quality Program Licensee, which indicates that the company is committed to the FIFA Quality Program, has quality systems in place and has fields ready to test. The pre-requisites for application are focused on the company's quality assurance, experience, product declarations, achievements of the defined standards and qualifications of staff and on the company's intentions as a FIFA Quality Program Licensee.

• FIFA Preferred Producer

To provide greater certainty to purchasers of Synthetic Football Turf, FIFA introduced a second tier accreditation program in 2004 to focus on "Whole of Life" quality assurance of the installation of the field.

The eligibility criteria for a FIFA Preferred Producer (FPP) are more onerous than a FIFA Licensee's accreditation. Applicants must have been a FIFA licensee for a minimum of two years, have a minimum of ten FIFA-certified fields at the moment of application, comply with the Code of Conduct of the WFSGI (World Federation of the Sporting Goods Industry), and have no legal action or dispute in the past two years by or with FIFA or a member association of FIFA.

The key aspect of this FPP status is that the manufacturer has to ensure that their distributors, partners, affiliates or anyone representing them install a quality product or, as the parent company/FPP, they may have to ensure that any corrections or repairs are conducted. For the end consumer, the main advantage in using a FIFA Preferred Producer is that they only have to deal with one company for the whole installation from construction planning to maintenance. Within Australia/New Zealand the following FPP's offer their products directly or through licensees:

- CC Grass (Tuff Turf)
- Limonta (Greenplay Australia)
- FieldTurf (Turf One)
- Polytan
- Greenfields (HG Sports Turf)
- Saletx Oy (HG Sports Turf)

Full details of contacts for both FIFA Licensees and FIFA Preferred Producers are [here](#).

The Importance of Testing

The importance of having the field tested is linked to both achieving performance standards and risk mitigation, with some re-testing needed depending on the quality of the field purchased.

The benefits of testing include:

- Peace of mind that it meets the required standards;
- Ensuring that the durability of the product lasts the planned life expectancy;
- There will be reduced risks associated with the system;
- The maintenance is being carried out adequately; and
- The ongoing performance characteristics are being achieved.

The performance tests measure three key aspects of the turf in the field:

- Ball/surface Interaction: The reaction of a ball to the surface.
- Player/surface Interaction: The reaction of a player to the surface.
- Durability: The resistance of the surface to wear and tear and the environment.

There are two FIFA Accredited Test Institutes in Australia that can offer the certification of Football Turf Fields, [Acousto-scan](#) and [Labosport Australasia](#).



LisportXL durability testing machine (Labosport)

Financial Investment Needed

The Whole of Life Expense Commitment

To appreciate the investment needed, there are three stages of a field's whole of life (WOL) cycle which need to be considered as shown below. These are for a FIFA Quality mark pitch and include ancillary equipment such as goal posts, fencing and floodlights. The three stages are:

- **Capital Investment** – including field and ancillary items, fences, lights etc.
- **Maintenance Costs** – depending upon the level of use.
- **Replacement Costs** – considered over 10 and 20 years.

Within each of these WOL stages, the tables have considered the following aspects:

Capital Investment and Installation Costs

Consider the following indicative design and construction costs for a field of 7,818m² to a FIFA Quality mark field standard. These are estimates only, and costs can vary greatly depending on the site and any issues encountered. In addition, ancillary items such as fencing, lighting, goals and coach's boxes have been considered and therefore costed in.

1. Type of pitch		Football
2. Size of area field	Per m²/lin.metre	7,810
3. Field establishment direct costs		Total cost of field
Design		\$10,000
Site establishment, documentation & project management		\$100,000
Sub grade works	\$13	\$101,530
Drainage, gutters and concrete works	\$22	\$171,820
Base pavement or asphalt	\$45	\$351,450
Synthetic surface with standard infill	\$38	\$296,780
Shock pad installation	\$23	\$179,630
Pitch Sub-Total	\$141	\$1,211,210
Ancillary Costs		
Fencing	\$11	\$85,910
Lighting	50 100 lux	\$150,000
Equipment	\$0	\$30,000
Other		
Ancillary costs Sub-Total	\$11	\$265,910
Contingency & PM Costs	15%	\$221,568.00
TOTAL INVESTMENT		\$1,698,688

Maintenance Costs

The maintenance costs will be determined by the level of usage and the recommended maintenance schedule from the field supplier. As a guide, the following categories should be considered:

- Less than 40 hours weekly usage = 6 hours of maintenance
- Between 40 and 60 hours usage = 8 hours of maintenance
- Over 60 hours usage = 10 plus hours of maintenance

MAINTENANCE COSTS		
Component	AUD \$ cost	
Pitch Costs	Under 40 hours	40 - 60 hours
Routine maintenance grooming	\$12,000	\$16,000
Professional service grooming	\$3,000	\$4,000
Algaecide / Weedicide materials	\$500	\$500
TOTAL COST FOR FIELD	\$15,500	\$20,500

Replacement Costs

The life expectancy of fields will be determined by the quality of product, although most should last up to eight to ten years provided recommended maintenance schedules are adhered to, and good manufacturers will provide guarantees for a period of eight years plus. The following are indicative replacement costs over a 10 and 20-year period.

REPLACEMENT COSTS (unit rates based on todays prices)		
Component	Cost per m2/linear m	Cost of this project
Pitch Costs		
Removal & disposal of existing synthetic grass surface	2.5	\$19,525
Shock pad rectification	3.3	\$25,773
Synthetic surface installation		\$296,780
Shock pad replacement every 20 years		\$179,630
Pitch Sub-Total		\$521,708
Ancillary Costs		
Fencing (replace chainmesh)		\$15,000
Lighting		\$48,000
Equipment		\$7,000
Ancillary costs Sub-Total		\$70,000
TOTAL COST FOR FIELD		\$591,708

Income Offset Costs

If a club or council pay for the installation from Capital Works then the revenue/cost of use can be calculated per hour of use. If the field is used approximately 40 hours per week annually, the cost per hour of use would be \$31 per hour. With 24 players using the field for an hour that is only \$1.30 each.

The Importance of Maintenance

Maintenance is critical to ensure the life expectancy of the field, reduction of injuries, playability standards, ability to achieve re-testing, and to ensure terms of the warranty are met.

FIFA provide excellent guidance documentation for synthetic field maintenance, as do Smart Connection Consultancy with their Smart Guide to Maintaining Synthetic Sports Turf, including these general principles:

- Promote the benefits of developing a documented and policed maintenance regime linked to the level of use.
- Educate in relation to the different protocols and procedures needed.
- Emphasise the need for regular monitoring and inspection.
- Recognise the need to refer to experts.
- Ensure that maintenance is considered as part of the procurement process.











Each option needs to provide a maintenance manual for the purchaser which guides them on periodic and regular maintenance. The responsibility for maintenance normally falls between routine and specialist maintenance where specific machinery is needed. This is best explained in the table below.

MAINTENANCE ACTIVITY	RESPONSIBILITY	EXAMPLES
Regular	<ul style="list-style-type: none"> • Ground staff • Field owners 	<ul style="list-style-type: none"> • Daily inspections • Weekly grooming
Specialist	<ul style="list-style-type: none"> • Surface installer • Trained technician 	<ul style="list-style-type: none"> • Surface de-compaction • Rotating brush and infill cleaning • Infill rejuvenation • Repairs • Algae treatment

A typical maintenance schedule may look like this:

DAILY ROUTINE MAINTENANCE	WEEKLY ROUTINE MAINTENANCE	MONTHLY ROUTINE MAINTENANCE	SCHEDULED MAINTENANCE
<ul style="list-style-type: none"> • Fixtures and fittings monitoring and inspection • Make sure gates are shut and secure • Top up levels at key places (penalty area etc.) 	<ul style="list-style-type: none"> • Clean natural debris and any rubbish • Clear any weeds, especially around fences • Brush surface of field 	<ul style="list-style-type: none"> • Infill levels • Seams of inlaid lines checked • Drag brush 	<ul style="list-style-type: none"> • Treat pitch for moss and weed • Power brush • Deep clean • Surface de-compaction (6 monthly)

Key Australian Contacts

<p>Football NSW Daniel Ristic, Manager - Government Relations, Funding & Infrastructure Valentine Sports Park 235-257 Meurants Lane, Glenwood NSW 2153 Mobile: 0402 511 777 Phone: 02 8814 4451 danielr@footballfacilities.com.au www.footballnsw.com.au</p> 	<p>Smart Connection Consultancy Martin Sheppard, Managing Director AAMI Park, Ground Level East 60 Olympic Boulevard, Melbourne VIC 3001 PO Box 5247, South Melbourne VIC 3205 Mobile: 0404 022 355 Phone: 03 9421 0133 martin@smartconnection.com.au www.smartconnection.com.au</p> 
<p>Polytan (incorporating Team Sports) Rob Kirkwood, National Sales Manager Polytan STI Factory 3, Dunlopillo Drive, Dandenong South, VIC 3175 Mobile: 0417 224 870 Phone: 1800 663 812 rob.kirkwood@polytan.com.au www.polytan.com.au</p> 	<p>Tiger Turf Nick Kerr, National Sales Manager 2/12 Latitude Boulevard, Thomastown, Vic 3074 Mobile: 0429 501 787 Phone: 1 800 802 570 n.kerr@tigerturf.com www.tigerturf.com</p> 
<p>HG Sports Turf Nathan Humphreys, General Manager ACT, NSW, QLD HG Sports Turf Pty Ltd 6/403 Flemington Road, North Melbourne Victoria 3051 Mobile: 0448 174 892 Phone: 03 9329 8154 nhumphreys@hgsportsturf.com.au www.hgsportsturf.com.au</p> 	<p>Turf One Lyndon Joselyn, Director Turf One 330 Towts Road, Whittlesea, VIC 3757 Phone: 03 9719 1900 info@turfone.com.au www.turfone.com.au</p> 
<p>Greenplay Anthony Saba, Director Greenplay Australia, 3/550 Churchill Road, Kilburn SA 5084 Mobile: 0406 993 160 Phone: 1300 769 499 as@greenplay.com.au www.greenplay.com.au</p> 	<p>Tuff Turf Fraser Gehrig, Company Director Tuff Turf 453 Shearson Crescent, Mentone, Victoria, Australia 3194 Phone: 03 9583 8283 fraser@tuffturf.com.au www.tuffturf.com.au</p> 
<p>Grassports Australia (NSW) Hayden 2/16 – 18 Resolution Drive, Caringbah, NSW 2229 Mobile: 0401 882 331 Phone: 02 9525 601 info@grassports.com.au www.grassports.com.au</p> 	<p>FieldTurf Australia Rachael Ash Commercial Director ANZ Unit 8, Port Air Industrial Estate 1A Hale Street, Botany NSW 2019 Mobile: 0467 670 042 Phone: 02 9316 7244 www.fieldturf.com.au</p> 

To provide Clubs and Associations with opportunities to obtain further information and advice on the matters addressed in this Guide, Football NSW and NNSWF has identified the above suggested contacts. These are, however, suggested contacts based on that they are either a FIFA Preferred Producer or FIFA Licensee or an Agent of one of these. Inclusion in this Guide should not be taken to suggest that Football NSW or NNSWF endorses or recommends any specific supplier.

Acknowledgements

California Department of Resources, Recycling and Recovery
Crumb-Rubber Infilled Synthetic Turf-Fact Sheet
European Synthetic Turf Organisation FIFA NSSCE Conference
FIFA Quality Concept for Football Turf FIFA Technical Studies
New York State Department of Health
Scandinavian Journal of Medicine and Science in Sport Smart Connection Consultancy
Sports Medicine; Surface related injuries in soccer Sports Turf Institute
Synthetic Turf and Grass: a comparative study. Am J Sports Med

Appendix & further reading

[Stadium Technical Requirements](#)

[New York State Department of Health](#)

[FIFA Technical Study 1](#)

[FIFA Technical Study 2](#)

[FIFA Technical Study 3](#)

[FIFA Technical Study 4](#)

[California Office of Environmental Health Hazard Assessment \(OEHHA\)](#)

[Football NSW Hot Weather Policy](#)

[ESTO Shock Pads Working Group Update](#)

[FIFA Quality Concept for Football Turf](#)

[Handbook of Requirements](#)

[Handbook of Test Methods](#)

[FIFA licensees and preferred producers](#)

[FIFA synthetic field maintenance guide](#)

[Smart guide to maintaining synthetic sports turf](#)





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