



FOOTBALL
VICTORIA

THE SMART GUIDE TO

SYNTHETIC FOOTBALL FIELDS

INCLUDING **HYBRID TECHNOLOGY**

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Disclaimer

Smart Connection Consultancy do not accept any liability for the accuracy of the information provided. All material and information that is provided from the third parties is done so in good faith to assist organisations understand the key issues around synthetic sports fields. We will continually update the Smart Guide to attempt to keep the industry updated.

About the Smart Guide Series

Smart Connection Consultancy is committed to sharing knowledge and learnings with the industry and has produced a number of Smart Guides which can be downloaded free of charge from our website www.smartconnection.net.au

These guides include:

- The Smart Guide to Synthetic Surfaces (2014)
- The Smart Guide to Maintenance of Synthetic Sports Fields (Long Pile) (2016)

- The Smart Guide to Synthetic Sports Surfaces – Challenges, Perceptions and Reality (2018)
- The Smart Guide to Synthetic Football Fields (2018)

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Welcome and Purpose

The popularity of synthetic sports surfaces used by many sports, local governments and within the education sector in Australia has significantly grown in the last two decades to complement the natural turf fields. This enables the local community to participate in sport when the demand on natural fields cannot be accommodated.

The key football codes in Australia have all embraced synthetic sports field technology for their community clubs and some for their elite players. Their aim is simply to provide more opportunities for communities to play sport and appreciate that the synthetic sports fields is one way of creating significant additional playing hours in many areas where fields are in short demand.

The aim of this *Smart Guide to Synthetic Football Fields* is to provide guidance to organisations who are interested in understanding the options available to them for adopting synthetic sports turf technology. It also provides an overview of the key football codes, the required global standards and their approaches in Australia. It is anticipated that this should guide community groups in appreciating the benefits and use of such investments.

Smart Connection Consultancy is passionate about working with organisations that are keen to encourage their community to be more active. Sport is one of the vehicles to achieve this and provides many physical, community and health benefits.

Smart Connection Consultancy has embraced the use of sports field technology, whether that be natural, hybrid, synthetic or alternative sports surfaces to complement natural fields, as a vehicle to promote and provide the community with opportunities to be more active more often.



Photo 1: Football (Soccer) Gosnells LGA - WA (ABS installation)



Photo 2: Rugby Union - Latham Park - NSW (Polytan installation)



Photo 3: AFL & Football - ELS Hall Park - NSW (installed by Turf One)



Photo 4: Football, AFL and Cricket - St Kevin's College Vic (installed by Tuff Turf)

1 Introduction

The growth of the Australian population over the past 21 years has seen an increase of over six million¹ (33%) from approx. 18 million to 24 million people. The expected population in the next 15+ years will rise to be over 31 million² (approx. 40% increase) and this will seriously impact on sports field provision and accessibility in many cities around Australia.

This demand will continue to place significant pressure on sports field infrastructure around key cities in Australia where demands for additional playing fields and additional hours per field continue to exceed the hours available for natural surfaces.



Photo 5: Typical sports field in NSW half way through football season with natural grass

The ability to cater for the growing demand of natural playing fields is causing concern to many inner city local governments. These natural turf fields are under greater capacity pressure and this results in increased stress levels to the natural turf. Many local governments are embracing the synthetic sports turf technology to complement natural turf and satisfy community need.

Many are embracing the synthetic technology to reduce the stress on natural sports fields by decreasing the intensity of training to allow them to recover during the week as the training is then on synthetic surfaces.

The benefits of synthetic sports turf caters for increased playing capacity, often more than 60

hours a week, and offering a consistency that is not detrimentally impacted by drought or excessive rain. Football codes in Australia benefit from this technology and the growth in synthetic fields for Soccer, Rugby (Union and League), AFL and multi-sports fields, continues to increase.

These synthetic sports fields have evolved over the past 50 years and are now known as the Third Generation fields, or 3G pitches. Many councils and sport are seeking alternative technology solutions from natural and synthetic fields. Many wish to support a more natural solution and have sought information regarding hybrid solutions, integrating natural turf and synthetic technology. This resulted in the development of what is commonly referred to as hybrid technology



Photo 6: NSW Field after synthetic field installed (installed by Turf One)

This Smart Guide to Synthetic Football Fields aims to provide advice to organisations who are keen to explore how synthetic sports field technology can complement their natural turf fields and satisfy the growing demand by all codes. This Smart Guide to Synthetic Football Fields addresses:

- The evolution and benefits of synthetic sports surface technology;
- An explanation of what a synthetic football turf system consists of;
- The global and local standards needed for each sport;
- Whole of life costs; and
- Key contacts in Australia.

¹ ABS, [Australian Demographic Statistics](http://www.abs.gov.au/ausstats/abs%40.nsf/94713ad445ff1425ca25682000192af2/1647509ef7e25faaca2568a900154b63?OpenDocument) (cat. no. 3101.0), Data extracted on 21st December 2016

² ABS, <http://www.abs.gov.au/AUSSTATS/abs@nsf/mf/3222.0>

2 Synthetic Sports Turf Evolution and Benefits

2.1 Evolution of Synthetic Turf for Football

The technology of synthetic sports turf has evolved significantly since 1964 when Monsanto developed the First-Generation turf, which was a knitted nylon carpet with foam backing and was introduced for indoor Grid Iron in America at the Houston Astrodome in Texas and became known as AstroTurf grass in 1966.



1st Generation Artificial Grass

© Loughborough University; www.sportsturf.lboro.ac.uk

- 10 – 12 mm fibre length, integral shock pad developed 1960s, nylon, unfilled, hard, abrasive
- Used for hockey at the 1976 Montreal Olympics

The Second-Generation carpet promised to be more aligned to 'natural turf' with an infill that was to act similar to the growing medium of natural fields and to keep the yarn upright. Sand was used, and the yarn was 20-35mm in height. The tightly packed polypropylene blades of grass being used looked very similar to natural grass but did not 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 far 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 has 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).



Photo 7: 2nd Generation Synthetic Turf (source: Cranfield University www.cranfield.ac.uk)

At the end of the 1990'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 standards that were needed for synthetic football turf had 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 community playing capacity and climate challenges. This has resulted in the emphasis on 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 performance and playing surface, especially with regard to contact sports.

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

The Third-Generation (3G) turf was developed from these learnings and this is what is used in Australia and globally today. Each manufacturer continues to explore enhancements within the 3G fields to fine tune the experience for the players and the performance outcomes.



Photo 8: Multi-sport field in Sutherland Shire (Kareela Oval)

2.2 Benefits of Synthetic Turf Football Codes

All the football codes appreciate the technological benefits it brings to assist with the growth of their code as the population continues to grow in Australia. The key benefits of installing a synthetic sports field include:

- **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:** Optimising the playing capacity of a natural turf surface can be time consuming, expensive and generally requires a qualified person with many Councils finding that if they do not increase weekly maintenance, at the end of each year the renovation costs increased dramatically. Synthetic surfaces require lower ongoing maintenance and limited renovation compared to 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; and
- **Health:** By allowing play on the surface more often and under safer conditions, it enhances physical health of participants and reduces their injuries; 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.

2.3 History of Synthetic Sports Turf in Australia for Football Codes

Australia has started to embrace the synthetic sports turf technology as a norm now, with the last twenty years the key milestones have included:

- 1998 – AstroTurf (USA) installed Football (soccer) field into AIS (Canberra)
- 2005 – Victorian Soccer Stadium installed three football turf fields (Darebin) with a FieldTurf product installed by Tiger Turf



Photo 1: Victorian State Football Centre, Darebin

- 2008 – AFL published community field guidelines, with Cricket Australia for Australian Rules Football fields
- 2010 – AFL’s first field installed at JJ Holland Park, City of Melbourne by TEAM Sports (now Polytan)
- 2014 – Rugby Union’s first field installed and Certified fields at Blackman Park, Lane Cove by TEAM Sports (now Polytan)



Photo 2: Blackman Park, Lane Cove, NSW

- 2016 – Australia’s first multi-sport certified field at Moore Park, Sydney, allowing

Football, 11-a-side, 5-a-side (FIFA Quality mark), Rugby Union (Regulation 22 standard) and Rugby League (Community Standard) installed by Polytan



Photo 3: Moore Park, NSW

- 2017 - Rugby Union’s first standalone field – commissioned by Randwick City Council (NSW) at Latham Park against World Rugby’s Regulation 22 standard, installed by Polytan



Photo 4: Latham Park, Randwick, NSW

2018 – Expected date for Rugby League’s first League only field in Blacktown, NSW.

3 Synthetic Sports Turf System for Football

3.1 Introduction

A synthetic sports turf system has several components that must be in place for fields to play in accordance with the performance criteria stipulated by the sport.

The quality of performance of the playing surface is influenced by the components that make up the overall synthetic sports turf system.

3.2 Performance System

Each manufacturer has its own system, but the

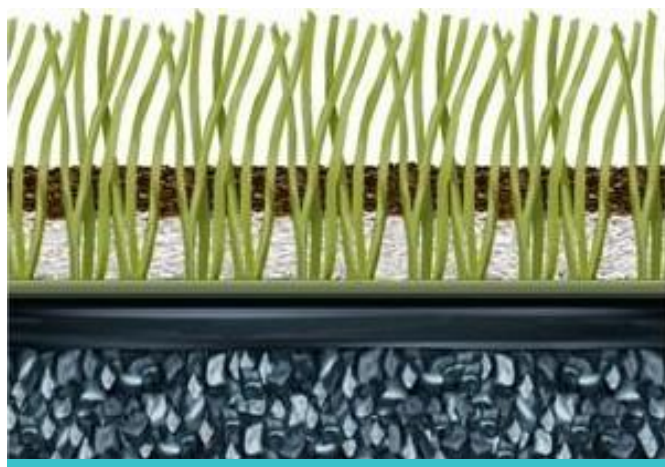


Figure 1: Source FIFA quality concept for Football Turf, showing the turf, rubber and sand infill, shockpad and typical pavement base

latest generation of synthetic fields generally comprise a synthetic grass carpet containing a layer of stabilizing sand, topped with in-fill, which is most usually rubber but can also include organic matter. This is then recommended to be 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 normally comprises of a civil engineered pavement constructed upon a sub-base.

3.2.1 Third Generation Football Turf Yarn

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 microns) and softness is critical to achieving a durable and playable finish. There is 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 of yarn per square meter. It is also renowned for staying upright longer and being durable. The negative of this system is that it normally exhibits greater infill splash and movement of infill across the field.
- **Tape or 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 softer and is moving, so a system that has a range of 50-60mm is recommended. Rugby has a minimum requirement of 60mm.

The use of hybrid synthetic yarn surfaces combines both a monofilament yarn and a fibrillated tape allowing for additional durability and the entrapment of the infill.

This hybrid approach reduces infill splash with the ball and seems to reduce heat in certain systems by encapsulating the black rubber, reducing the surface temperature.

- **Cooler Grass Technology**

Most of the manufacturers have a proprietary approach to the reduction the heat retention in the yarn, some claim by 20-30%. This is worth considering when purchasing. It is always worth considering the question 20-30 percent of what? This reduction normally occurs because the polymers in the yarn can reflect infrared and dissipate heat into the atmosphere, as opposed to absorbing them into the yarn.

- **Pile weight/Density**

Identifying the quality of yarn within a square meter, using the number of stitches and the gauge manufacture. As a rule, the tighter the pile, the higher the price. The linear density is a measure of the weight of the yarn and is referred to as the 'Denier'.

3.2.2 The Backing

The backing material is critical as it holds the tufted or woven yarn in place but also needs to be durable enough to hold the field in place, so there is no shrinkage or expansion. It is also critical for connecting each roll of grass on the field, allowing water to pass through the surface.

The tufted yarn option is predominantly tufted through the backing and the yarn needs to have a coating or glue type bonding agent so that the tufts cannot be easily moved or pulled out.

The most commonly used coating is a polyurethane bonding agent, due to its superior water resistance. Latex, thermo-plastic coatings, natural rubber and other bonding agents can also be used. The porosity of the backing is normally achieved in one of two ways; either using a heat

soldering hole and puncturing across the roll of grass, or having the polyurethane backing only attributed to the yarn tufted areas and the space in between the tufts is therefore more porous.

The majority of carpet backing is double backed with the 'second backing' sprayed on to seal the carpet tufts. Some manufacturers only 'seal' the turf and gauge, leaving the space between not double sealed, allowing for greater water porosity. These pictures below provide an understanding of the two key options.

The water porosity through the carpet backing must be achieved for the key sports. For instance, in football (soccer) the FIFA guidelines are 180ml per hour. In rugby union the World Rugby guideline is 500ml per hour, whilst Australian Rules (AFL) is 200ml. Smart Connection Consultancy recommends all pitches should have a porosity rate of 500ml per hour. It's important to design drainage rates to cope with this.



Photo 9: Examples of Backing Surfaces

3.2.3 Carpet Seams and Joining

The carpet is normally created on rolls of 3.2m – 4.5m in width and these are laid width wise across the field. The 'straight lines' are normally integrated when woven and the circular lines laid at installation.

Any other straight seams are usually secured by sewing or using an adhesive, depending upon the manufacturer's system. The important point is that the carpet should be seamless and have a maximum possible joint strength.

The adhesives used should be proven in Australia and are not considered volatile in adverse weather conditions (e.g. heat, rain, wind, humidity etc.).



Photo 10: Example of seam failure

3.2.4 Infills

The infill for football fields assists the performance of the whole synthetic 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 or plastic (either recycled or virgin) or organic infills.



Photo 11: Silica Sand (Source: www.flexsand.com)

The amount of fill is normally determined by the manufacturer when they consider the length of the grass yarn, the performance outcomes, use of shock pad and purpose of the field. For Soccer we would recommend a minimum of 50mm. Rugby cannot be played on a system less than 60mm according to the World Rugby Regulations (22). There are five key infill options with various combinations as follows:

- i. **Crushed or Recycled Rubber (SBR)** – The most popular and 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. Although the initial recommendations for AFL Fields were sand-based, the standards and industry norms for the fields now show that the rubber fields are a better outcome.

- iii. **Virgin Rubbers & Plastics** – 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. Also, TP and TV's are from the same Thermo Plastic family; and
- **EPDM** – Provided from three monomers; ethylene, propylene and diene and normally in light green or light brown in colour.



Photo 12: EPDM 'Bionic' infill (Source MELOS)

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 any heavy metal traces are lower than the acceptable levels for toys, if components of them are indigested and would cause a problem. These need to be UV tested before installation in Australian conditions as some cheaper versions lose their colour quickly. Some have been known to lose their performance characteristics very quickly and

should be linked to a warrantee that stipulates performance over a defined period.

iv. **Organic** – There still seems some experimentation on this option within the Australian climate with the use of water cannons to keep the infill moist, which precludes it from many open parklands. This would be the optimum surface for heat reduction, as the organic infill is damp.



Photo 13: Organic Infill (Source: Limonta)

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. This option needs greater maintenance and in open space parks needs to be considered very carefully to justify the cost implications. It has been observed that at times the cork can become harsh on peoples skins after dray hot days as it dries out.

v. **Combined Options** – Some suppliers are being innovative 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 organic infill. This offers a great outcome at an affordable investment. The challenge is that the Topping can be encapsulated by the main infill and it has been found in

Australia that these toppings do not work long-term, unless they are regularly topped up.

3.2.5 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:

- **Prefabricated Shock pads**

There are a number of products on the market, including 5m roll out sheets or matting (2m x 1m) with interlocking functions. These are normally 10-30mm thick.



- **In-situ Shock pads**

This surface infill mix comes in a variation of thickness between 10mm-35mm 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) provided the outcomes of a thorough research project that recommends that shock pads should be used when there is any doubt that

the maintenance levels may not be kept up with patronage usage and with usage intensity.

“When a Football Turf (World name for synthetic football field) system is regularly and adequately maintained all systems (with and without shock pad) did retain an acceptable level of performance; and

Within the range of tested samples, we see that the systems containing a high-quality shock pad were likely to show less deterioration than the system without a shock pad in cases where the maintenance was not done correctly.”³”

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 for every football field.

The shockpads normally come with a warranty, which can be between 8 and 25 years. The longer the better as this will reduce the number of replacements, with a good quality replacement being 25 years and this would then accommodate three surface replacements (24-30 years). Smart Connection Consultancy has recommended for the past eight years that all of its clients specify shock pads for all long pile fields.

3.2.6 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.

3.3 Civil Engineered Solution

3.3.1 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 and an environmental analysis.

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

- Support vehicle load during the construction, maintenance and replacement phases to ensure no negative deformation of the surface;
- Integrate with the synthetic surface to ensure that the sports' performance criteria are achieved; and
- Part of the field drainage strategy to take the water away from the pavement by protecting the surface from other sub-grade movement or water.

3.3.2 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. There are three common approaches to the drainage challenges on fields that ensure that they meet the International Federation standards for porosity.

3.3.3 Option 1: Free Flowing Aggregate Base

The aggregate base allows for the water to progress through the carpet and shock pad before using gravity to progress through the voids to a drainage line around the base of the pavement

³ Press Release – European Synthetic Turf Organisations Recommend Shock Pads for Synthetic Sports Fields, 2014

around the sports field. Using different sizes of rock will force the water through and to the outside of the fields.

With void space of approximately 40% between the rocks this allows the water to slowly seep through the pavement and drain to the storm water exit pipe. The depth of the pavement can be linked to the amount of water that needs to be retained and released slowly.

3.3.4 Option 2: Ag Drains

With a free draining pavement of crushed rock there are Ag drains placed at regular intervals and designs (e.g. herringbone etc.) across the field, which are normally cut into the surface once the pavement is completed. This does have a tendency of impacting on the integrity of the pavement base.



Photo 5 Ag drains to have a tendency to move after installation which impacts on the surface

Recent replacement of synthetic carpets identified that these Ag pipes have collapsed and so many designers are moving away from this solution.

3.3.5 Option 3: Drainage Cell

Utilising a 'dry pavement' with a Geotech lining and drainage cell on top and beneath the shock pad allows the water to pass through the turf system.



Photo 14: Example of horizontal drainage cell under shockpad (Source: Wayne Stuart - City of Swan, WA)

With the assistance of gravity and an incline of around 0.8%, allowing the water to drain to the edge of the field and to a collector drain, which then takes the water to the storm water pipe.

The cell is predominantly around 30mm in thickness and should be linked to the rain event that is needed. There have been some 10mm cells used that cannot cope with the level of water used, so there needs to be a logic to the size used for each project.

The drainage cell allows for the quick removal of water as long as the storm water pipe can cope with the discharge speed. This may not be the right solution for all fields.

The drainage strategy adopted needs to be linked to the annual rain event that the owner wants to embrace. Most are using a 1 in 10-year annual rain event for either 10 or 20 mins duration. High parameters can be set, including 1 in 25 years and this will increase the cost of the engineer's solution.

4 Hybrid Technology for Football Fields

4.1 What is Hybrid Grass Sports Turf?

Hybrid Grass Systems are simply the combining of the positive properties of natural grass with the strength and durability of synthetic turf fibres into a single sports turf system. This will create a higher quality and more durable all year-round natural playing surface, combining the playability of natural grass with the durability of synthetic turf.

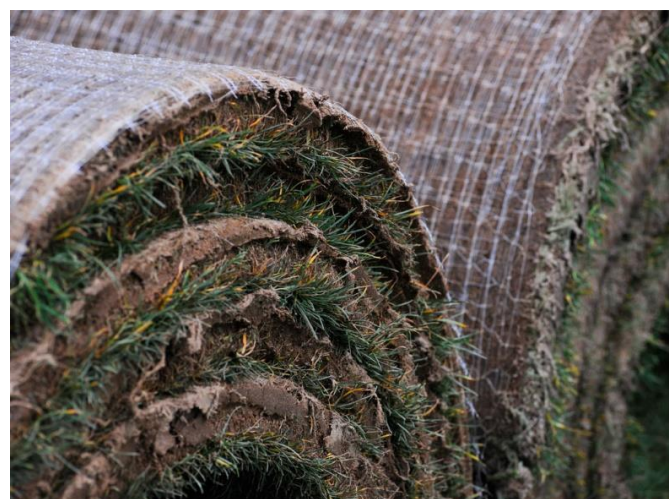
Forms of ‘hybrid grass systems’ have been around for over 20 years, particularly in Europe. Hybrid grass systems enhance the performance of a natural turf profile by increasing; :

- laying capacity up to 30-35 hours per week
- stability of surface and root zone
- Load bearing capacity
- Durability of the natural grass
- Playing performance characteristics
- Agronomic performance
- Bio-mechanical performance

The additional benefit of a hybrid system is that it aesthetically provides a partially green surface, if the natural grass becomes worn through increased usage.

Some considerations in choosing a hybrid solution are:

- Modified maintenance regime compared to natural turf field to manage thatch levels and keep the fibres interacting with the surface
- On excessively used fields, or where not maintained well, the synthetic yarn fibres can lose interaction at the surface.
- Annual renovation required to maintain the benefits of the hybrid system



Eclipse Stabilised Hybrid “Ready to Play Turf”
(Picture courtesy of HG Sports Turf)

There are predominantly two types of hybrid systems used to enhance natural fields of play, including:

- **Mat System** – where a mat, carpet, or grid backing (knitted, woven or tufted), similar to synthetic turf backing; supports the fibres which are infilled with various growing mediums in which the natural turf is grown. Knitted and woven hybrid grass systems have very strong fibre anchorage to the backing whilst turfed systems are less so.
- **Permanent Systems** – where synthetic fibres are injected or stitched into the surface, not attached to any backing, with some of the synthetic fibre (20mm) standing proud of the pitch, with the natural grass growing between the fibres.

The hybrid system manufacturer should be consulted to determine the most appropriate system for use in each application and the natural grass species to complement the selected system.

4.2 Profile Reinforcement

In addition to the above hybrid systems, there is also a range of profile reinforcement systems. A profile reinforcement system incorporates synthetic elements within the growing medium to improve the structural performance of the profile,

(i.e. reduce divoting). Example of these system include:

- **Fibre System** – where various types of synthetic fibre and elastic material are mixed into the soil or growing medium homogenously and into which the natural grass is grown, providing root stability within the growing medium (e.g. sand or soil).
- **Mesh-based System** – where either a mesh or shredded mesh is mixed into or placed in-situ into the root zone area, where the grass will grow.

4.3 Types of Systems

4.3.1 Mat, Carpet, Grid / Ready to Play Systems

The mat, carpet or grid system can be ‘built’ into the field of play in-situ or pre-grown at a turf farm/nursery and then brought to the field as a Hybrid Grass “ready to play” Turf System .

These systems can be incorporated into existing grounds or placed on sand carpeted/constructed fields; however, some of the drainage performance may be restricted and would have to be evaluated on a case by case basis.

The mat system is filled with a growing medium, which could include sand, soil, organic components, to best allow the natural grass to grow in the local environment.

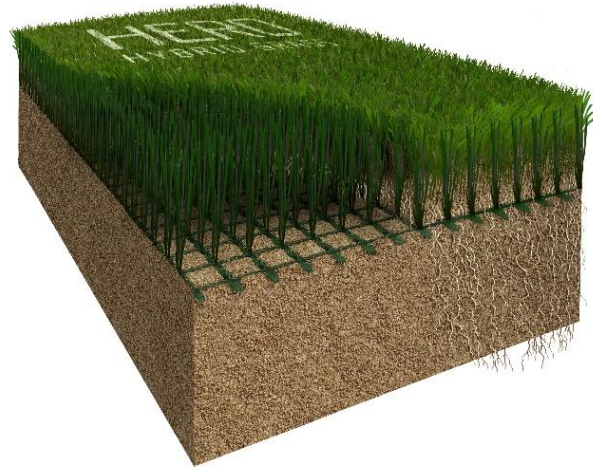


Photo 7:HERO Hybrid Grass

Some hybrid mat, carpet or grid system backings are designed to partially biodegrade over time allowing the roots an open zone to grow down into the lower profile layer thus creating a very stable system that performs as one.

The finished surface presents itself as a mixture of synthetic grass fibres and natural turf.

Advantages

- Quick to install (if grown offsite as a ready-to-play system)
- Good for community and higher use sports fields than natural turf due to its durable and robust construction

Disadvantages

- Cannot be installed after turf is grown
- Potential to impede on the performance of the playing surface profile growing medium due to mat backing

Many global stadiums have installed these type of hybrid surfaces and in Australia that includes MCG, AAMI Park, ANZ Stadium, Optus Stadium to name a few and several stadia in New Zealand including Eden Park, Westpac Stadium, McLean Park Stadium and also in Asia including Singapore National Stadium and Nissan Stadium, Yokohama.



Photo 6: Xtragrass Hybrid Grass

At a local community level mat, carpet or grid backing Hybrid Grass installations completed in Australia are in high wear areas, goal squares, centre bounces, soccer boxes, linesman runs and cricket run-ups.



Photo 15: Hybrid carpet – Mixto by Limonta – www.mixtoststem.com

4.3.2 Permanent Systems

The permanent systems involve the injection of fibres into the surface which are approximately 20mm proud of the growing medium (sand, soil etc.) with the synthetic yarn installed to a depth of 180mm below the surface.

A number of councils have installed these systems, including:

- Casey Council – Casey Fields
- Monash Council – Brandon Park
- Hume City Council – John Ilhan Reserve
- Bayside Council – Dendy Park
- City of Port Phillip – Wattie Watson Reserve
- Whitehorse Council – Mont Albert Reserve
- City of Wyndham – Galvin Park
- Alexandra Football Club
- Carlton FC – Ikon Park

Example of the mat, carpet or grid systems are:

- XtraGrass Hybrid
- HERO Hybrid Grass
- Mixto
- Desso Play Master
- Extreme Grass

The stitching process is typically undertaken when there is a sufficient turf coverage.

Many stadiums globally have this type of system. Now this patent has run-out other companies are offering similar technology. The only current field in Australia is Melbourne City Football Club's training venue at Latrobe University, Victoria.



Advantages

- Increased stability of surface and root zone
- Increase playing capacity up to 30-35 hours per week
- Can be installed with existing fields
- Does not impeded on the performance playing surface profile growing medium



Photo 16: Desso GrassMaster machine stitching the yarn into the field and Melbourne City FC GrassMaster Pitch (Picture Courtesy of HG Sports Turf)

Disadvantages

- Renovations annually after winter season
- Cost
- Struggles to meet the multifunctional needs of Australian Stadiums

Typical examples in Australia:

- Melbourne City FC Elite Training Pitch – La Trobe University

Examples of the permanent system are:

- Desso Grassmaster
- SIS GRASS

4.3.3 Use of Hybrid Systems for Community Fields

Australia and New Zealand have started considering the adoption of hybrid technology for high use natural turf sports fields for either the whole field or the high use areas.

The high use areas may include goal boxes, half way line, the 'kicking area' straight up and down between the goals or the line referees areas on the touch line. High use areas and training fields are also being considered to alleviate wear on primary fields.

. Maintenance Commitment

Depending on the hybrid system, the maintenance regime is similar to that for a natural turf playing surface with some restrictions (i.e. slit aeration

methods due to the integrity of the backing for mat systems)

Annually it would be recommended that the following maintenance is considered:

- Fraise mowing – cleaning thatch and organic debris
- Vert cutting 15mm deep – opening surface and release buried fibres
- Top dressing
- Deep aeration with vertidrain
- Fertilization
- Over seeding/Grass re-establishment
- Irrigation and maintenance

4.4 Cost of Hybrid Grass

The lifecycle of a hybrid system is dependent on:

- Level of use
- Level of maintenance

The following table provides an overview of the expected life cycle for hybrid system.

Year	Activity
0	Hybrid system installed
Annual	Turf renovation – remove organic matter, restore infiltration rate, relieve compaction, 'stand up' synthetic fibres, and develop turf cover in worn/ bare areas
7-10	Removal of organic layer and hybrid system

Costs

The following table provides an estimate for the typical costs for hybrid systems.

Hybrid System	Rate (/m ²)
---------------	-------------------------

Mat system: In-situ installed	\$50-60
Mat system: Ready-to-play	\$100-120
Permanent system:	\$150*

* Rate dependent on strength of the Australian dollar and shipping of the installation plant

4.5 Conclusion

It is a certainty that Hybrid Grass systems will become adopted more widely across Australia and New Zealand. With every increasing populations leading to higher demands and increased capacity of usage on sports fields it is becoming evident that councils and municipalities require a mix of options to satisfy the community needs.

In some cases, community resistance to giving up “green space” in favour of traditional synthetic sports fields have resulted in Hybrid Grass being chosen as a solution to increase capacity.

The ‘hybrid’ grass systems allow the fields to be played on from the natural grass systems playing capacity of 12-20 hours to 30 – 40 hours, but they still need rejuvenation of a summer and rest.



Photo 17: Lines person running lines being reinforced with hybrid technology (Source: HG Sports Turf)

5 Sports Embraces Synthetic Technology

5.1 Importance of Performance for Football Codes

The development of performance standards for all of the main Australian football codes has been one of the reasons for the rapid acceptance of the technology by the majority of the sports community.

The performance standards for each sport identify the safety, performance, playability, technical and durability standards that a synthetic sports system needs to achieve. This demonstrates and provides confidence to the users that the field will play with similar 'playing qualities' of a quality natural turf field. The emphasis of these standards is focused on the interaction between the surface, players and the ball, reflecting the playing characteristics for each football code.

It is critical for all football codes that when a purchaser is considering procuring a synthetic sports system that the installation is to the appropriate International Federation sports required standards, also detailed below.

5.2 Governing Body Standards

5.2.1 Overview

All the Football governing bodies in Australia have either embraced the global standards from the International Federation (Football and Rugby Union), developed their own directly (AFL) or have enhanced the International Federation standard for local conditions (Rugby League).

Each sports code developed standards from quality natural turf fields with specific performance standards that can be measured in a laboratory and in the field of play. All of the sports have similar processes that need to be followed before a field can be certified against a specific standard. It is worth checking for each sport specifically.

The common approach is:

- Laboratory Test - to ensure that the product/system performs to the Testing Handbook/Guide
- The installation of a system that has passed the Laboratory Tests
- Insitu-testing - an Independent Test Institute will then test the field against the appropriate performance standards
- Certification - the International Governing Body will then issue a certificate for the playing field for the specified standards and duration (1-3 years depending upon the sport)

5.2.2 Licencee's / Preferred Producers

Each sport has its own approach to recognising manufacturers or installers in a manner that they believe assures quality for the sport, with details provided later in this section for each sport.

When procuring synthetic systems from Licensees or Preferred Providers they may have Agents within Australia working on their behalf. When considering engaging these Agents one needs to consider their experience, capability and capacity for the project. Even the world's best synthetic surface would only be as good as the construction and installation employed.

5.2.3 The Importance of Testing

The importance of having the field tested should not be underestimated, for less than \$10,000 it will provide the purchaser with confidence that the system they have purchased meets the safety and performance standards that the International Federation has stipulated. It works as a 'Risk Mitigator' and some sports such as Rugby Union and AFL will not insure players who play on fields that do not hold a current certification.

FIFA, as the governing body for Football (Soccer), encourage their standards to be improved if a particular region of the globe has specific issues. Smart Connection Consultancy has, over the years

enhanced specific FIFA/World Rugby/NRL/AFL standards that will assist with durability, UV, heat issues, management and porosity needs that we have in Australia.

5.3 Sports Standards

This section provides guidance for each sport's specific standards in 'layman's terms', identifies key contact information for each sport and recommends access to further knowledge sharing.

5.3.1 Australian Rules Football / Cricket

Approach to using Synthetic Surfaces

As custodian of the game, the AFL has recognised the need to develop ways to increase the carrying capacity of their surfaces and protect them against weather extremes as more people wish to play their sport. This approach should assist in increased participation rates, reduce injuries and allow more people to play more often.

In 2007 the AFL, together with Cricket Australia, Sport and Recreation Victoria and Australia's largest public-sector insurance company, JLT Trustees, collaborated with researchers⁴ to develop a set of guidelines for community use of synthetic surfaces on which to play Australian Rules Football and Cricket. As the majority of Australian Rules Football grounds are also cricket grounds, it was important for any standards to ensure it was suitable for play by both sports.

The study explored the playing characteristics of quality natural turf and developed the performance criteria that the surface needs to play against, including the mechanical properties of the surface, ball and player interactions with the surface, using internationally recognised testing equipment and procedures.

The results of the study enabled a development of standards for Artificial Turf for AFL and Cricket⁵ since this time a small number of AFL pitches have

been tested, a number of others have been installed where cricket is played on football (soccer pitches), and the same standards are used. In 2013 the standards were updated with a user-friendly handbook⁶ for any sport. The handbook 'fine-tuned' the standards, in light of what has been learnt on synthetic turf since 2008, which has been reissued in March 2018

Standards for the Sport

The AFL and Cricket Australia standards that have been adopted are targeted to the community level and not for elite or professional levels. The performance standards can be sourced at http://www.aflcommunityclub.com.au/index.php?id=891&no_cache=1&sword_list%5B%5D=fields

Regarding cricket, many councils have used synthetic wickets for years and this has historically been covered by soil during the winter months. This often causes safety concerns and reduces the consistency of play where the soil is located. According to Cricket Victoria guidance⁷, the wicket should be 25m – 28m long and 2.4m to 2.8m wide, and the turf should be between 9 and 11mm in length.

Licensee and Product Endorsement Program

Since the development of standards, the AFL and Cricket Australia established a licensee program that ensures the quality of synthetic surfaces installed will meet the player and ball performance criteria with the surface and has the durability required.

AFL/Cricket Australia has a number of licensed manufacturers and these can be found at www.aflcommunity.com.au

⁴ Ballarat University (now Federation University)

⁵ Development Standards for the use of Artificial Turf for Australian Football and Cricket (2008 DIW May; L. Otago; N. Saunders; E. Schwarz; University of Ballarat School of Human Movement and Sport Science

⁶ Australian Football League and Cricket Australia Handbook of Testing for Synthetic Turf (Sep 2013 www.aflcommunity.com.au)

⁷ Reference: Letter to LGA's in Victoria -dated 2010

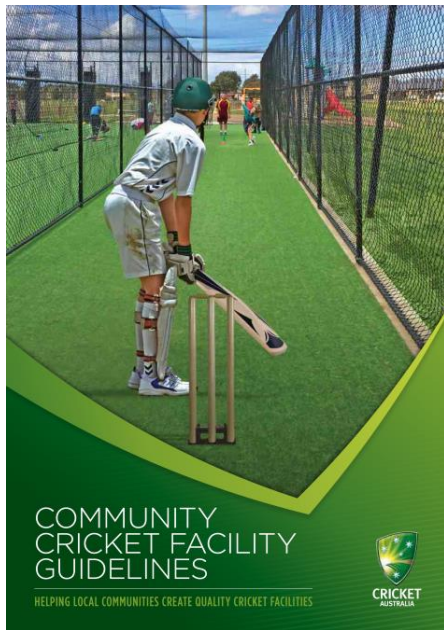


Photo 18: Football Turf has now been laid in more than 100 fields in Australia

Contact details:

AFL and Cricket Australia
 Shayne Ward, Executive Officer,
 AFL/Cricket Australia Synthetic Turf
 Program
 AFL Victoria
 Visy Park, Gate 3 Royal Parade
 Carlton North VIC 3054
 GPO Box 4337, Melbourne VIC 3001
 t: +41 3 8341 6085
 w: www.aflcommunityclub.com.au
 e: syntheticurf@afl.com.au

5.3.2 Football (Soccer)

1. Approach to using Synthetic Surfaces

Football has been played on synthetic grass for a number of decades with the Federation International de Football Association (FIFA) embracing the benefits of synthetic turf allowing more people to play ‘The World Game’. The use of synthetic grass surfaces (designated ‘Football Turf’ by FIFA) over the past 15 years has resulted in the development of performance standards based on quality natural turf performance standards.

To ensure that the quality of football turf was consistent across the globe, FIFA developed the FIFA Quality Programme in 2001 and is being continually improved with the latest guidelines⁸. These guidelines were updated and re-issued late 2015.

The FIFA Quality Programme for Artificial Turf is a rigorous test program for football turf that assesses the ball surface interaction, player surface interaction and durability of the product.

FIFA has two categories of performance standards, namely:



FIFA Quality mark – aimed at high surface use for municipal or sports club level field (recommended for more than 20 hours use per week).



FIFA Quality PRO mark – for professional and stadium usage (recommended for less than 20 hours use per week).

Within each recommended category there is a durability test (The LisportXL Test), which simulates wear and tear from usage. This

⁸ FIFA Quality Concept for Football Turf – Handbook of Requirements – January 2012

durability test is key to the decision making of which type of field to purchase. The FIFA Quality pitch needs 6,200 cycles simulated wear, while FIFA Quality Pro pitch is only 3,200 cycles.

Therefore, the durability of a FIFA Quality systems is generally two times that of a FIFA Quality Pro pitch. FIFA recommend that the FIFA Quality PRO field be used for 20 hours a week and for Professional Football while the FIFA Quality field would be more than 40 hours.

2. Standards for the Sport

The performance criteria measured are the same for both quality marks, although the acceptable criteria range differs slightly. This allows the FIFA Quality field categories, which only has to be tested every three (3) years, to have greater latitude (less than 5 percent difference in most categories) to meet the needs of the intensity that a 40-60 hour usage pattern would expect. The standards for the two surfaces identified can be sourced in the Quality Manual at <https://football-technology.fifa.com/en/media-tiles/about-football-turf/>.

The re-testing of fields is FIFA Quality Mark pitch every three years and FIFA Quality Pro pitch every 12 months.

3. Licensee / Preferred Producer Program

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 entry level system is known as a FIFA licensee, which indicates that the company is both committed to the FIFA Quality Programme, has quality systems in place and has fields ready to test. The pre-requisites⁹ for application include:

- ISO 9001 or equivalent,
- Evidence that the company is a tufting company,

- 3 fields that have been tested to the International Artificial Turf Standards (IATS),
- Maintenance guidelines for at least one of its synthetic systems,
- Reference of a qualified civil engineer who conducts work for the organisation,
- Product declaration of the product that is to be tested in the initial test,
- Method statement for the installation of the artificial turf system to be tested initially, and
- Business plan covering the company's intentions as a FIFA Quality Programme Licensee.

At the time of the Smart Guide going to press, FIFA has 19 licensees of which some are offering products in Australia/ New Zealand. A full list can be found on the FIFA website at www.FIFA.com/Quality.

FIFA Preferred Producer (FPP)

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

The eligibility criteria are more onerous than the licensee's accreditation. Applicants must:

- Have been a FIFA licensee for a minimum of two (2) years,
- Have a minimum of ten (10) 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 any of their

⁹ FIFA Quality Programme for Football Turf: Application as Licensee

distributors, partners, affiliates or anyone representing them, installs a quality product, otherwise 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 the construction planning to maintenance.

With Australia/New Zealand the following FPP's offer their products directly or through licensees:

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

Full details of contacts for both FIFA licensee's and FIFA preferred producers are listed at www.FIFA.com/Quality.

4. Field Installation

Recent installations over the past 6-7 years for football fields total over 140, Victoria has over 60 and NSW has approximately 50, with the rest of Australia housing in excess of 30 fields. It is expected that another 30 plus pitches to be installed in 2018. Recent commitment and installations for Tasmania, ACT, WA, SA and Qld demonstrate how this technology is encouraging people to play the game.

Contact details:

FIFA
FIFA – Strasse 20
PO Box 8044 Zurich, Switzerland
t: +41 (0) 43 222 777
w: www.fifa.com
<http://www.fifa.com/contact/form.html>

5.3.3 Gridiron / American Football

In 1969, Franklin Field, University of Pennsylvania switched from grass to artificial turf. Over the past 40 years some of the National Football League (NFL) teams have changed back to natural grass,

with some also deciding to reinvest in the latest generation synthetic technology. The University of Pennsylvania is one example that switched from synthetic (2nd generation) to natural grass before reverting to a 3rd generation pitch.

In Canada all eight stadiums in the Canadian Football League (CFL) use synthetic sports turf.

There are no standards for gridiron / American football except the Clegg Hammer Test which measures hardness. If a NFL organisation was to consider this in Australia / New Zealand, it is recommended they should consider the World Rugby standards or AFL/Cricket Australia standards, especially due to the critical head fall criteria.

Contact details:

Gridiron Australia
P.O. Box 170
Woden, ACT 2606
w: www.gridironaustralia.org.au
e: info@gridironaustralia.org.au

5.3.4 Rugby League

Approach to using synthetics Surfaces

Rugby League in Australia and New Zealand is controlled under their national governing body, namely the National Rugby League (NRL) in Australia and the NZRL in New Zealand.

The International Federation for the sport, the Rugby League International Federation (RLIF) currently seems to have limited scope in relation to synthetic surface governance.

The UK's governing body for Rugby League, the Rugby Football League (RFL) have embraced the technology and set standards which have been used at both community and stadium/professional level. In Australia the National Rugby league (NRL) has worked with the English RFL and has adopted their standards and enhanced them for Australia.

Standards for the Sport

The original Rugby Football League (RFL) standard based on the European Standard EN

15330-1: Surfaces for Sport Areas has been modified for the specific requirements of Rugby League in 2011. The standard takes into account the results of a comprehensive study into the performance of natural grass pitches.

Recognising that many artificial turf Rugby League pitches will also be used for Football or Rugby Union the NRL standard has been aligned with the requirements for FIFA and World Rugby Regulation 22 wherever possible.

Similar to the FIFA Quality Concept, the NRL performance standard recognises requirements for community and stadium use. Products suitable for Rugby League play have to pass initial laboratory approval before being able to be installed and tested in the actual field application.

The NRL standard specifies two categories of performance: The category called 'stadium' is intended to replicate the characteristics of high-level natural grass as found in well maintained stadium settings. Surfaces meeting the 'stadium' category are intended for use in professional matches and training. The second category called 'community' which has a wider acceptance range than the stadium category is supposed to replicate the characteristics of good quality community natural grass fields.

Whilst community pitches shall be retested every two years, stadium pitches require a field retest on an annual basis.

In general, community grounds have to sustain a much higher level of use compared to stadium pitches that are predominantly used for competition matches and professional training. In this respect, the NRL categories 'stadium' and 'community' are comparable to the FIFA Quality PRO and Quality marks.

However, in terms of expected durability the NRL standard recognises only a high level of resistance to simulated use by specifying 20,200 conditioning cycles on the older Lisport Test whereas FIFA allows 5,200 cycles for its FIFA

recommended Two Star category. The NRL approach seems to reflect the expectation that in a stadium setting artificial turf has to sustain a much higher level of use compared with natural grass. Accordingly, the different categories and their respective acceptance ranges apply to both the laboratory test requirements as well as the field test requirements. These standards will be updated for Australia's NRL in 2018.

The NRL Rugby League Standard - The detail

Similar to other performance standards, the specifications for laboratory and field test requirements in the NRL standard can be divided into three areas:

1. Product identification and durability
2. Ball-surface interaction
3. Player-surface interaction.

Product identification tests apply to all components of the surface system. The artificial grass component is analysed in terms of its carpet configuration, such as machine gauge (e.g. distance between the rows of tufts), pile height, pile weight as well as tufts and total mass per unit area. Pile yarn materials are characterised in terms of the polymer used and the tensile strength of the pile yarn. The quality of the carpet construction is determined by the tuft withdrawal force, tensile strength of the carpet and joint strength.

The prescribed shock pad or elastic layer is identified by its thickness, tensile strength and force reduction. Performance and stabilising infill are characterised by particle grading and shape in addition to bulk density. Both yarn and performance infill typically of polymeric nature, are subjected to artificial weathering testing for color change and changes in material composition (e.g. degradation).

Due to the shape of the rugby league ball, the ball-surface interaction tests generally refer to a football rather than a rugby ball. The expectation is that hard and compacted surfaces produce a

ball rebound that is too high, whereas very soft surfaces cause the ball to rebound too low.

Player-surface interaction tests have also been harmonised with FIFA Quality Concept and World Rugby's One Turf standard. Measurement of shock absorption, vertical deformation and energy restitution are being determined using the new Advanced Artificial Athlete (AAA) device. The NRL standard acknowledges that values prescribed for energy restitution are meant as target values and do not prevent passing of a product if values are found to be outside the prescribed range.



Photo 19: Stadium Perimeter Advertisement (Source: Signgrass)

Similar to other performance standards, rotational resistance, skin friction and abrasion are used to set parameters for safe interaction between the player and the surface. Similar to the rugby union standard in World Rugby's Regulation 22, the RFL standard uses the head injury criterion in accordance with EN 1177 and specifies a critical fall height of equal or greater than 1.3m. Generally, the majority of laboratory tests are conducted on dry and wet sample specimen.

For field testing, the surface, ambient temperature and the ambient relative humidity are recorded as part of the field test report. Field testing also assesses surface regularity using a straightedge and graduated wedge and the gradient of the pitch. Finally, infill depth and vertical free pile height have to fall within prescribed ranges of the manufacturers declared value.

Additionally, the porosity of pitches may be perceived as an issue in certain parts of the

country, which receives short bursts of rain that is intense and often curtails games and training on natural turf. The NRL standard for porosity is the toughest of all sports; the shock pad needs to be permeable enough to allow more than 300mm of water to pass through its surface.

Product Licensing

There is no product licensing presently in Australia, or by the world governing body.

Contact details:

National Rugby League
Rugby League Central
Driver Avenue, Moore Park NSW 2021
t: +61 (2) 9359 8500
w: www.nrl.com

5.3.5 Rugby Union

Introduction

Rugby Union has historically been played on grass, despite several proposals over the years for alternative solutions, including clay, shale, sand and the Second-Generation artificial grass. All presented similar problems due to the nature of the game and the interaction players have with the surface.

In the past 20 years the technology around synthetic turf has provided proven solutions for the game of rugby and the rugby world has embraced this because of the benefits for increasing participation, quality of play and consistency for the game.

To ensure the quality and consistency of the surface World Rugby developed the Artificial Rugby Turf Performance Specification 10. This standard was integrated into the Game within Law 1 and Regulation 22 and provides guidance on how it must be used for the game.



Photo 20: Rugby Union playing on synthetic field (Source: Team Sports)

World Rugby has only one standard for synthetic turf, that applies to both community and stadium use.

Performance Standards

Similar to the FIFA performance standards, World Rugby has identified three basic categories that are broadly defined as:

- **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.

The World Rugby requirements include a HIC performance level which, currently, a shock pad is needed to achieve.

The performance criteria can be sourced at [www.http://playerwelfare.worldrugby.org/](http://playerwelfare.worldrugby.org/)

World Rugby Preferred Turf Producer

Producers, are recognised by World Rugby as being having the experience to design, manufacture and install good quality artificial turf rugby fields. A list of PTPs can be found on the World Rugby website at

www.playerwelfare.worldrugby.org

Field Installation

Over the past few years global embracing of synthetic turf for Rugby Union has progressed significantly with over 600 rugby fields installed globally. Within Australia there are 9 Fields that currently comply with Regulation 22. These include Lane Cove in NSW, Randwick (x 2), Moore Park and Woollahra .

Contact details:

Rugby Australia
Rugby Australia Building, Cnr Moore Park Rd and Driver Ave
Moore Park NSW 2021
t: +41 (2) 8005 8565
e: customer.service@rugby.com.au
w: www.rugby.com.au

World Rugby

World Rugby House
8-10 Pembroke Street Lower
Dublin 2, Ireland
p: 00 353 1 240 9200
e: info@worldrugby.org
w: www.worldrugby.org

5.3.6 Multi-Sport Areas

Approach to Synthetic Surfaces

There are many positive examples where a purchaser of a new synthetic sports turf is interested to use the surface for more than one sport. In these cases, a request has been made to ensure the performance standards meet the needs of the sports involved. Some of these collaborations have included:

- Football code collaboration (soccer; Australian Rules Football; Rugby Union and Rugby League)



Photo 21: Collaboration of multi-sport field (Football, AFL & Cricket) between Whittlesea City Council and Mill Park Secondary College

- Football (FIFA 1 Star) with Hockey (National and Multi-sport)



Photo 8: University of Queensland which has two fields that have been tested for Football and Hockey

Moore Park is probably the most comprehensive certified field, designed for the Football codes of Soccer, Union and League.



Photo 9: Moore Park multi-sport field, catering for 11 and 5 side football, rugby Union and Rugby League

5.4 The Importance of Testing

The importance of having the field once installed tested to ensure it can be certified against the various sports playing standards is critical to ensure that it achieves the performance standards and to reduce risk for the owner, the players and can create a positive environment for the development of skills.

In addition there are other benefits including:

- Peace of mind that you have been provided with the systems performance outcomes that you requested and paid for
- Ensure that the durability of the system lasts the planned life expectancy
- That the ongoing maintenance is achieving the outcomes needed to successfully have it retested

There are two approved independent Test Institutes in Australia, and both are listed at the back of this Guide. The Test Institutes are in turn accredited by the International Federations to ensure that they are capable of carrying out the testing to the standards needed. As independent Test Institutes they do not act as consultants on other parts of the surface design or procurement as this then compromises their independence. In the same manner other consultants cannot offer to undertake this part of the process.

6 Perceptions and Concerns within the Community

6.1 Introduction

Synthetic sports turf for football fields is similar to other new technologies being introduced in society, there are early adopters, people who follow afterwards when a success and people who are reluctant to embrace change.

Many of this latter group have strong beliefs and need to be presented with facts and information in a manner that allows them to broaden their knowledge.

Some people just prefer the idea of playing, or watching others play on natural grass fields. In the ideal world there would be adequate space for this to happen. Unfortunately, natural turf fields can only cope with 20-25 hours usage per week.

This means that for the local governments who are land-locked, or where their population is growing, the number of hours fields need to cope with weekly demand are exceeding their capacity. This is when synthetic turf technology could be a solution.

These synthetic sports fields have evolved over the past 50 years and are now known as the Third Generation fields, or 3G pitches.

These 3G pitches use sand and a performance infill, which is normally a rubber infill. Historically, this rubber was made from recycled car and truck tyres, which is a very durable material and saves millions of used tyres from being dumped in landfill sites globally.

The health and safety of all sports facilities is a concern to the asset owner and the sports program providers. As a result, there tends to be a sophisticated decision-making process to minimise the potential risk to players, etc.



Photo 10: Field after being converted (Hornsby Council NSW)

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 the natural grass being replaced by synthetic surfaces.

What is not understood by these community groups, is that if many community level natural grass surfaces were tested to the same rigour as synthetic sports surfaces, they would not pass the performance criteria that synthetic turf would. Therefore, the synthetic sports turf is safer than most badly-worn community playing fields.

The key concerns for health and safety are predominantly:

- Player safety and injuries,
- Surface playability,
- Environmental impacts
- Health risks to community,
- Heat management.

The Smart Guide to Synthetic Sports Turf - Challenges, Perceptions and Reality explores all these areas in detail can be downloaded free of charge at www.smartconnection.net.au

7 Financial Investment Needed

7.1 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:

7.2 Capital Investment and Installation Costs

Consider the following indicative design and construction costs for a field of 7,810m² 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 of field	7,810.00	7,810
3. Field establishment direct costs	per m2 / lin. Metre	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

7.3 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 = 4 hours maintenance
- Between 40 and 60 hours usage = 4-6 hours maintenance
- Over 60 hours usage = 6+ hours maintenance

MAINTENANCE COSTS			
Component	AUD \$ cost		
Pitch Costs	Under 40 hours	40 - 60 hours	Over 60 hours
Routine maintenance grooming	\$12,000	\$16,000	\$20,000
Professional service grooming	\$3,000	\$4,000	\$5,000
Algaecide/ Weedicide materials	\$500	\$500	\$500
TOTAL COST FOR FIELD	\$15,500	\$20,500	\$25,500

7.4 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

7.5 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.



Smart Sky Sports Field Complex
concept design . 19-06-2018 .



8 The Importance of Maintenance

8.1 Introduction

The Smart Guide to Maintaining Synthetic Sports Turf (Long Pile) has been developed for the growing number of sports, education establishments, commercial operators and local governments who are installing synthetic sports fields for various sports and recreational facilities. It is expected these organisations may benefit from an enhanced understanding of why maintenance is important and what commitments should be made. This can be downloaded from the Smart Connection Consultancy's web page free of charge (www.smartconnection.net.au)

Although it is generally recognised that synthetic turf has a major advantage over natural turf in respect to the reduced level of maintenance and need for annual field rejuvenation, there is still a need for programmed routine and special maintenance activities.



Photo 22: Turf not maintained adequately is showing the yarn is being bent over due to lack of adequate infill and weeds are being allowed to grow

When maintenance is not conducted by the field owners the life expectancy can be significantly reduced. Although no rigorous research can be found the authors, through their experience and with evidence from testing laboratories¹⁰ and International Federations¹¹ have provided input to

the impacts of limited or no maintenance, including:

1. Unable to achieve recertification against sports performance standards;
2. Reduced life expectancy;
3. Increased safety concerns;
4. Dilapidation of product; and
5. Voiding of warrantee.

With most International Federations, performance standards maintenance manuals must be provided by the installer/manufacturer for the field to guide the owners on their roles and responsibilities for maintenance and upkeep. The manufacturers manual will be linked with the manufacturer warrantee, so if different verbal advice to reduce maintenance is received, it should only be accepted in writing otherwise the warrantee may be invalid.

8.2 Key Principles of Maintenance

To optimise the balance between maintenance need and usage the following key principles are recommended:

8.2.1 Maintenance investment needs to be linked to usage of the fields

The more usage a field receives, the more maintenance is required. The intensity of the usage may be around specific areas (e.g. goal mouths for Football, Scrum line for Rugby etc.) which may need more maintenance than the rest of the field.



Photo 23: The more usage the more maintenance is needed (Source: FFV)

¹⁰ Labosport International – National Synthetic Surface Conference – Alastair Cox, 2014

¹¹ FIFA – National Synthetic Surface Conference – Dr Eric Harrison, 2014

8.2.2 Maintenance should focus on ensuring playability and performance

Lack of maintenance significantly impacts on the performance characteristics such as; ball speed, uneven roll of the ball, ball bounce and for the player; poorer grip on the surface and harder running due to compaction of the infill.



Photo 24: Organic infill displaced after rain, needs to be brushed to redistribute infill by using specialist machinery that can collect it and redistribute it accordingly. (Source: Smart Connection Consultancy)

8.2.2.1 Pre-Installation design

'Hot spots' are evident on any field and influence players or machinery in a way that increases the need for additional maintenance. This can be mitigated at the design stage and include:

- Player entry point(s) – with only a single entry point the field area will become very congested and infill compacted.
 - Suggest using a number of gates to dissipate the intensity of wear and tear
 - Consider hard-wearing mats/mesh on the outside of the gate to reduce 'soil' being brought in and 'infill' being taken out. Make this area at least 2m x 2m



Photo 25: Player entry point at Victorian Council site (Source: Smart Connection Consultancy)

- Integration between synthetic and natural turf – try and have a concrete/asphalt pathway so that grass does not easily integrate into synthetic turf
- Machine entry points – consider reinforced base solution to ensure adequate access, possibly two gates to alternate entrance/egress of machinery
- Fences to assist security and reduce opportunist crime such as cars entering the field
- Cross-field pitches – for training/recreational games so that the high wear areas (e.g. goal mouths) are rested
- Rubbish bins outside fence – to alleviate excess rubbish entering the field of play
- Installation of boot cleaners close to entrance gates
- Warm-up Areas – off the field, so that there is no need to warm up on the field

8.2.2.2 Installation of field acceptance

As part of the installation there should be critical hold points (e.g. completion of pavement base) that is tested and achieves the required performance standards. On completion the field needs to be tested and pass the sports certification process. Failure to consider either of these stages may provide problems to the operator and no matter how much maintenance is invested; the field will never achieve the required performance standards.

8.2.2.3 Maintenance can only be achieved successfully with appropriate machinery and trained staff

The technology of the synthetic turf systems need appropriate machinery and trained staff, which is why many fields have the majority of the 'machine maintenance' aspects sub-contracted.



Photo 26: Maintenance of the Fields Need to Be Considered in the Whole of Life Costings

8.2.2.4 Maintenance plans should be specific to each field

A generic approach will not work and may need to be changed according to the season (summer – lighter use; winter – heavy use); the age group of use (e.g. primary, junior and senior); the sport; and the intensity. This will ensure that the scheduling of maintenance is specific to the fields’ needs and not just to suit the operator.

1) Clarity of responsibilities of maintenance

Roles and responsibilities between the owner, operator, home club and maintenance company need to be clearly defined so there is no ambiguity between any of the stakeholders.

8.2.2.5 Management actions on how the field is used will impact on maintenance needs

Management actions can increase the need for maintenance such as allowing all coaching to be conducted in the same spot all of the time, as opposed to rotating it to low-use areas.



Photo 27: Maintenance between two different surfaces means that two different schedules or plans to ensure success are required

Other suggestions may include:

- Establish signage and training for local regular users on ‘local rules’ on how the field should be used;
- Do not use footwear that is not allowed;
- Do not use non-approved equipment on the fields e.g. stages, fireworks, tables and chairs etc.;
- Ensure each hiring ‘cleans up’ after usage; and
- No smoking on the field.



Photo 28: Regular walking over the field will identify key maintenance and risk management issues

8.2.2.6 Annual Review of Field

Each year, preferably at the end of the heaviest season (e.g. winter) conduct a thorough review of the field. If possible use an independent expert to assist the first time so that you know what you should be looking for – typically by walking up and

down the field every 5m, you should identify most problems.

If problems are found early they should be rectified quickly as part of any annual rejuvenation of the field. This may include finding issues around:

- Compaction in high-wear areas;
- Seams coming apart;
- High-wear along lines (sometimes due to high UV on white lines);
- Trip hazards;
- Excessive loss of yarn from areas;
- Reduction/displacement of infill;
- Movement of base pavement; and
- Ponding of water not draining adequately.

Smart Synthetic Sports Field Inspection and Maintenance Report

Field & Client Details:			
Name of field			
Address of field			
Client organisation			
Client contact		Contact Tel	
Date of visit		Time of visit	
Notes re field			
Contractor Details			
Contractor org. name			
Operators name		Operators Tel	
Inspection Details			
Outstanding issues			
Condition of field on arrival			
Details of maintenance carried out			
Key Findings (Write findings against each category)			
Surface		Contaminants / rubbish	
Infill		Penalty spot/ high wear areas	
Seams		Hazards	
Gates/fencing		Sports equipment	
Rectifications recommended			
1			
2			
3			
4			
5			
6			
Impacts if rectifications are not followed?			
Contractor signed		Client signed/dated	

8.2.2.7 Financial Investment appropriate to Life of Surface

The importance of continued financial investment into maintenance should not be compromised as this will only impact on the expected life of the fields.

8.2.2.8 Plan Ahead when Selecting the Synthetic Turf Product

The following should be considered when investing in synthetic long pile surfaces:

- High quality thicker pile yarns are significantly more resistance to pile splitting and flattening;
- Carpets with higher stitch rates are more resistant to pile flattening and infill dispersion; and
- Synthetic turf systems that incorporate shockpads or elastic layers generally suffer less from infill compaction than systems without.

A compliance guide to the maintenance of synthetic sports fields can be downloaded free of charge at <http://www.smartconnection.net.au/downloads/>.

9 Design Considerations for Football Fields

9.1 The Importance of Masterplanning

Each site is different and should be masterplanned to ensure that any development incorporating a new synthetic field of play also includes all of the necessary equipment, integration with the pavilion and surrounding infrastructure.

There is significant information and resources available that is worth considering when planning for new facilities. These are available from State/Territory departments of sport and recreation and National sport and state sport organisations.

9.2 Multi-sport Designs

An understanding of how the field will be managed and used is critical for the design and long-term success. The following should be considered:

- Seasonal Sport – Will the field be used for different sports over summer compared to winter? Many of the fields for football (soccer) have 5-a-side games lines laid in for summer use. Rugby may include half fields for Touch or Oz Tag etc.
- Single and multi-sport combining sports on one field is becoming more and more popular, using green lines over the white lines so that the field does not look over marked. Some good examples of multi-sport fields in Australia include:
 - Blackman Park, Lane Cove, NSW: Football (Soccer), Rugby Union, AFL and Cricket



Photo 29: Blackman park, Lane Cove NSW - Installed by Team Sports (Source - Lane Cove Council)

- Moore Park, Centennial Parklands, NSW: Football (11 and 5-a-side) Rugby Union and Rugby League



Photo 30: Moore Park, NSW (Installed by Polytan - Source Centennial & Moore Park Trust)

9.3 Field Layout and Lines

The size of the fields are normally determined by two key considerations – the Rules of the Game and the size of the field the client has to play with. The preferred layout and sizes of the fields can be accessed for all Football codes in Australia from the Western Australian Department of Sport and Recreation [here](#).

Football NSW has a significant number of guides to use for the design and procurement including:

- Building Development
- Drainage and Irrigation
- Field Markings and Equipment

- Grass Field Maintenance
- Football Lighting
- Project Management
- Provider Procurement and Management
- Synthetic Fields

These Guides are available [here](#).

Rugby Union field of play can be sourced from the Regulation 22 and the Rules of the Game at World Rugby [here](#).

Rugby League field designs and equipment is sourced can be sourced [here](#).

AFL support can be found [here](#).

9.4 Site Assessment Considerations

9.4.1 Overview

Site investigation is a crucial stage of any sports field development. The design solution and project budget will be dictated by the limitations and constraints of the site. It is important to undertake a detailed site investigation during the planning process of any project to understand possible limitations for development on the site.

The following minimum investigation is recommended to be undertaken during the planning stage:

- Identify existing in-ground services
- Flood Overlay
- Detailed feature survey
- Geotechnical Investigation
- Contamination Assessment
- Dial Before You Dig

9.4.2 Existing In-Ground Services

Confirm that there are no existing in-ground services that will impact on the proposed development (e.g. local water authority assets, etc).

This also includes overhead services (i.e. High voltage power lines) which often require clearance

offsets which may impact on the proposed development.

Dial Before You Dig (DBYD) is a free national referral service designed to identify authority assets to prevent damage and disruption to in-ground services for site within Australia. Dial Before You Dig is a single point of contact for all of Australia's underground asset owners.

9.4.3 Flood Overlay

Determining if the site is susceptible to flood water inundation is important to determine during the planning phase of a project.

A flood overlay enquiry can be submitted to a state or local government planning authority, or by conducting a detailed catchment and flood analysis.

If a site is susceptible to flooding, certain sports field surface options may not be feasible.

9.4.4 Detailed Feature Survey

A qualified surveyor should be engaged to undertake a detailed feature survey of the site. This information allows designers to plan the location of the sports field and associated infrastructure within a site.

3D elements of the detailed feature survey will enable designers to accurately tie into the surrounds of the site and determine the amount of imported fill/material to be taken off-site.

9.4.5 Geotechnical Investigation

A qualified geotechnical engineer should be engaged to undertake soil testing and provide recommendations for the construction of the proposed sports field. The geotechnical investigation will provide information on the composition of the underlying subgrade material.

If the site consists of poor ground conditions (e.g. reactive clays), the geotechnical report will provide recommendation for the remediation of the subgrade and measures to avoid potential

movement and cracking of the proposed field of play pavement.

Geotechnical investigations are crucial to assist in reducing risk of failing pavements by providing an appropriate design solution (e.g. capping layers, subgrade stabilisation) .

9.4.6 Contamination Assessment

A contamination assessment will provide important information regarding the presence of contaminants on a site that may pose health and development risks for a project. If contaminants are present on the site, an action plan with appropriate methods of disposal/ management will be provided.

There are typically two options that will be provided if contaminated material is found on site:

- Capping over the contaminated material
- Disposal off-site to an approved Environmental Protection Authority (EPA) disposal site

Disposal of contaminated material can add significant cost to a project, possibly resulting in the project becoming unfeasible.

9.4.7 Dial Before You Dig

A Dial Before You Dig enquiry can be submitted online to provide information regarding the underground and above ground assets and easements in and around the site. Local utility providers assets may pose limitations on the development of the site.

It is important to also remember that not all services will be picked up on a Dial Before You Dig enquiry

Useful Contact Details:

- Smart Connection Consultancy
www.smartconnection.net.au

Global Peak Bodies for Synthetic Turf

- Synthetic Turf Council
www.syntheticurfCouncil.org
- European Synthetic Turf Organisation
www.theesto.com
- Sports and Play Industry Association (Aus)
www.sapia.org.au
- Sports and Play Contractors Association (UK)
<http://www.sapca.org.uk/>

International Sports Federation

- FIFA Quality Program for Football Turf
<http://quality.fifa.com/en/About-the-programme/>
- World Rugby - Rugby Turf Program
<http://playerwelfare.worldrugby.org/rugbyturf>
- IAKS - International Association for Aquatics and Leisure Facilities
<https://www.iaks.org/>

10 Key Australian Contacts

10.1 Independent Advisory Services

Smart Connection Consultancy

Martin Sheppard
Managing Director
AAMI Park, 60 Olympic Boulevard
Melbourne VIC 3001
p: (03) 9421 0133
e: martins@smartconnection.net.au
w: www.smartconnection.net.au
Consultant to all Football Codes in Australia

10.2 Key Sports

Football

Football Federation Australia

Ricardo Piccioni
Government Relations Manager
Level 22, Oxford Street
Darlinghurst NSW 2010
p: 02 8020 4021
e: ricardo.piccioni@ffa.com.au
w: ffa.com.au

National Rugby League Limited (NRL)

Martin Meredith
Participation Manager
Rugby League Central
Driver Ave
Moore Park NSW 2021
p: (02) 9359 8500
e: mmeredith@nrl.com.au
w: www.nrl.com

Rugby Union

Rugby Australia (RA)

Steve Frost
Retention Manager, Rugby Participation
Rugby Australia Building, Cnr Moore Park Rd
Moore Park NSW 2021
p: +41 (2) 8005 8565
e: Steve.Frost@rugby.com.au
w: www.rugbyaustralia.com.au

Australian Football League Victoria (AFL)

Shayne Ward, Executive Officer, AFL/Cricket
Australia Synthetic Turf Program
AFL Victoria
Visy Park, Gate 3
Royal Parade
Carlton North VIC 3054
p: (03) 8341 6045
e: shayne.ward@afl.com.au
w: www.afl.com.au

Gridiron Australia

David Sedgwick
Chairman
PO Box 170
Woden ACT 2606
e: info@gridironaustralia.org.au
w: www.gridironaustralia.org.au

Touch Football Australia

Steve Mitchell
Chief Executive Officer
Suite 1/18 Napier Close
Deakin ACT 2600
p: (02) 6212 2800
e: jess.emmett@touchfootball.com.au
w: www.touchfootball.com.au

Australian Oztag

Bill Harrigan
Tournament Director
PO Box 703
Cronulla NSW 2230
p: (02) 9562 8633
e: info@oztag.com.au
w: www.oztag.com.au

10.3 Suppliers and Agents

ABS Sport Surfaces

3 Cochrane Street
Mitcham VIC 3132
p: (03) 9873 0101
e: daarons@berrysportsurfaces.com.au
w: www.abs-sportsurfaces.com.au

Fieldturf Australia

Unit 8A Port Air Industrial Estate
1A Hale Street, BOTANY NSW 2019
p: +61 2 9316 7244
e: belinda.crane@fieldturfaust.com.au
w: www.fieldturf.com

Grassports Australia

1/38 Green St
Doveton VIC 3177
p: (03) 9792 0622
e: info@grassports.com.au
w: www.grassports.com.au

Grassports Australia & ABS Sports Surfaces are an agent for Polytan, who are:

- FIFA Licensee
- World Rugby Preferred Provider
- AFL Approved Manufacturer
-

Greenplay Australia

3/550 Churchill Rd
Kilburn SA 5084
p: 1300 769 499
e: as@greenplay.com.au
w: www.greenplay.com.au

Greenplay Australia is an agent for the Limonta products. Limonta are:

- FIFA Licensee
- World Rugby Preferred Provider

HG Sports Turf Australia

Suite 2, Level 1
526 Whitehorse Road

Mitcham VIC 3031
p: (03) 9329 8154
e: info@hgsportsturf.com.au
w: hgsportsturf.com.au

HG Sports Turf is an agent for Desso, who are recognised as:

- FIFA Preferred Provider
- World Rugby Preferred Provider

They also provide a range of Hybrid solutions for local government, sport and stadia

Polytan

Factory 3, Dunlopillo Dr
Dandenong South VIC 3175
p: (03) 8792 8000
e: enquiry@polytan.com.au
w: www.polytan.com.au

- FIFA Licensee
- World Rugby Preferred Provider
- AFL Approved Manufacturer

TigerTurf Australia

14 Latitude Boulevard
Thomastown VIC 3074
p: 1800 802 570
e: auinfo@tigerturf.com
w: www.tigerturf.com

TigerTurf is an FIFA Licensee

Tuff Turf

58-60 Sunmore Close
Heatherton VIC 3202
p: 1800 887 326
e: enquiries@tuffturf.com.au
w: www.tuffturf.com.au

Tuff Turf is an agent for the Co-Creation grass (CCG) products. CCG is:

- FIFA Licensee
- World Rugby Preferred Provider

Turf One

330 Towts Rd
Whittlesea VIC 3658

p: (03) 9719-1900

e: info@turfone.com.au

w: www.turfone.com.au

- FIFA Preferred Producer
- World Rugby Preferred Provider
- AFL Approved Manufacturer

Turf One is an agent for the Fieldturf products.

Fieldturf is a:

- FIFA Preferred Producer
- World Rugby Preferred Provider

10.4 Independent Testing Institutes

Acousto-Scan

44/59-69 Halstead Street

South Hurstville NSW 2221

p: (02) 8385 4872

e: admin@acoustoscan.com.au

w: www.acoustoscan.com.au

Labosport Australasia

52 Raby Esplanade

Ormiston QLD 4160

p: (07) 3286 2237

e: keith.mcauliffe@labosport.com

w: www.labosport.com

About Smart Connection Consultancy

Smart Connection Consultancy offers an innovative approach that delivers outcomes to enhance the experience of participation in physical activity, recreation and sport in local communities.

We specialise in the planning, development, management and procurement of synthetic sports surface technology. We see this technology as complementing natural grass and encouraging more people to be active, play and achieve success in sport because of its extended durability.

By embracing the skills sets and knowledge of our collaborative consultants, we can provide an integrated and holistic approach to our client's projects.

Smart Connection Consultancy is the Technical Consultants for FFA, the NRL, and the Australian Rugby Union for Synthetic Surfaces.

Field of Expertise

In collaboration with industry experts, we provide our clients with high level quality service that is offered for a very affordable investment.

Commitment to Knowledge Building

We are committed to providing leading edge advice and knowledge so that the industry and our clients can appreciate how synthetic sports turf can complement their natural turf options.

Our Services Include:

Feasibility and Funding Advice and Solutions

Completing a Business Case to justify the need of a synthetic surface can be streamlined by using our *Smart Whole of Life Costing Model*. We support clients in developing financial strategies, funding applications and where applicable offer funding packages with major financial institutes.

Masterplanning and Design Solutions

We will work with you in exploring the site parameters and constraints together with the opportunities to ascertain the best design and management options for your park or venue.

Procurement and Project Management Support

Over 20 years' experience in procurement and in collaboration with SportEng, we provide the detailed civil engineering hold points to ensure that every step of the installation meets the appropriate civil and performance standards.

Our Clients

We have successfully completed a significant number of sports performance standards reviews, sports strategies, master plans, feasibility studies, business cases and procurement projects. Our client base includes:

- International Federations (FIH, FIFA, World Rugby)
- National and State Sports Organisations (FFA, NRL, ARU, AFL (NSW/ACT), Golf Australia, ASC, Hockey ACT etc.)
- Local Governments – More than 100 local governments with fields worth over

“Over the last four years the relationship the City has built with Smart Connection Consultancy has become integral to the development of our public open space planning, most notably the Ellenbrook District Open Space, which includes four synthetic playing fields.

Smart Connection Consultancy has contributed in many ways including various studies, reports and research tours that we continue to use today. The work has been outstanding: on time, on budget and most importantly of a very high quality.

Martin has been very accommodating in its approach to our requirements and continues to go out of their way to help us where necessary – always going that extra mile.”

Wayne Stuart, Facilities Planning Coordinator,
Asset Management – City of Swan



SYNTHETIC SPORTS FIELD HEALTH CHECK

Review your field, understand risks and extend life expectancy

Australia's leading synthetic sports surface consultancy is now offering the **Smart Sports Field Health Check**, for clients who wish to find out what condition their synthetic fields are in and what is the probable life expectancy.

Smart Connection Consultancy has been involved in over 70% of all the synthetic sports fields developed and installed in Australia in the past five years. We work closely with our clients to maximise their usage and life expectancy of their fields.

The **Smart Sports Field Health Check** consists of:

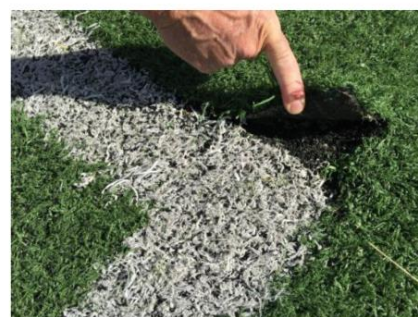
- ✓ Conducting a site analysis and field review to ascertain its current status;
- ✓ Assessing current maintenance practices to explore if this can extend the life of the field;
- ✓ Reporting on findings with improvement strategies;
- ✓ Risk assessment with mitigation strategies; and
- ✓ Predicting life expectancy.



Assessment Report provided within 48 hours of field assessment.

"The Smart Sports Field Health Check allowed us to appreciate the challenges we had, reduce our risks by adopting the risk mitigation strategies identified and we believe that we have extended the expected life by two years by adopting the recommendations for remediation and maintenance." (Mick Roberts, Sports Grounds Manager, ACT Government)

Call 03 9421 0133 and talk to Martin Sheppard or email martins@smartconnection.net.au to find out how the **Smart Sports Field Health Check** can extend the life of your synthetic sports field.



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