Smart Guide 3

Synthetic Sports Surfaces

Maintenance of Synthetic Turf (Long Pile).

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Acknowledgements

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Without their support, we would not be able to achieve our goal to enhance the knowledge of the industry on synthetic sports turf fields. We would also like to thank our colleagues, clients, and organisations that we have completed work for in the sports industry. It is your appetite for change and progress that makes our job so rewarding.

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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 surfaces. We will continually update the Smart Guide to attempt to keep the industry updated.

About the Smart Guide to Synthetic Sports Surfaces

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

The volumes have been updated for 2024 & the Smart Guide to Synthetic Sports Surfaces include:

- Volume 1: Sports Fields Surface Standards – Performance, Construction, Environmental, Safety & Sustainability
- Volume 2: Football Turf – Synthetic and Hybrid Technology
- Volume 3: Maintenance of Synthetic Turf (Long Pile)

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He clearly understands strategic and the political environment of sport, whilst also providing tactical and innovative solutions. Martin is an international speaker whose expertise is recognised for aligning synthetic surfaces and facility development, with player pathways, supply and demand forecasting and participation growth strategies.

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Welcome and Our Commitment

The popularity of synthetic sports surfaces used by many sports, local governments and within the education sector has significantly grown within the last two decades. Historically there was a perception that synthetic sports turf needed no maintenance and could also be played 24/7.

Photo 1: Football, AFL and Cricket - St Kevin's College, Vic (source: Tuff Turf)

Most local governments, schools and sports appreciate the need for maintenance, but are not sure of what needs to be done, or indeed why a maintenance program would vary depending on infill, yarn combination, age of field, seasonality or intensity or use.

The days of 'One approach fits all' are gone and this Smart Guide is keen to explain the different needs and approaches that should be adopted AND the investment that needs to be resourced to all the Football Turf (the technical name for 3G synthetic fields).

Smart Connection Consultancy is committed to reducing the impact of sports fields on the planets environmental footprint and we support the move from the quality turf manufacturers to be innovative and embrace environmental good practices.

Understanding that good maintenance and an annual renovation program for Football Turf, similar to natural turf will extend its life, allow greater usage intensity and ensure a more consistent and safer playing surface.

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, social and health benefits.

Smart Connection Consultancy has embraced synthetic sports surfaces as a vehicle to promote and provide the community with opportunities to be more active more often.

We want to do this as environmentally responsible as possible. Our design and construction approaches are explored in other Smart Guide volumes. Here we explore good practice in the maintenance and ensure that routine and planned maintenance is linked to the type of system, chosen infill, environment and most importantly usage intensity.

When organisations invest in synthetic sports fields it is crucial that they invest in the Whole of Life (WOL) of the surface to maximise the possible increased patronage life expectancy. This is achieved by having an appropriate maintenance strategy in place for the usage levels of the field and will maximise the Triple Bottom Line Return on Investment for the synthetic field.

Photo 2: Multi-sports facility ILLAM College (source: Grassports Australia)

This Smart Guide aims to provide the reader generically with:

- An understanding of why maintenance is critical;
- The different variables and how that impacts the type of maintenance;
- What maintenance should be considered;
- The latest trends and thinking on maintenance approaches;
- Maintenance for specific surfaces; and
- Examples of a maintenance manual.

It is anticipated this Smart Guide Volume 4 will assist your organisation achieve its goal to encourage more people, to play more often on your fields and the fields due to effective maintenance. This document should be read with the manufacturers Maintenance Manual and should not be used to replace it.

1. The Importance of Maintenance

1.1. Why maintain Football Turf?

With the growth in inner urban towns and cities the demand to participate in community sport continues to grow and place pressure on natural grass sports fields. This pressure, combined with the environmental stress of climate change with significantly more rain events and higher frequency of droughts and hot weather days, many local governments sports and educational establishments are investing in Football Turf to compliment natural turf options.

It is critically important if the Football Turf is to achieve its life expectancy and provide a safe and consistent playing surface it needs to be maintained in a manner that will achieve this. This means much more than just regular sweeping, if maintained properly the Football Turf should last 10-12 years of play or 30,000 hours of play. That equates to approx. 60 hours per week, 50 weeks per annum.

The benefits of a good maintenance program include:

- Compliance with manufacturing warranty,
- Consistent playability and performance,
- Increased probability of achieving life expectancy,
- Reduces risk of injuries and impact on players,
- Aesthetically optimised performance.

With fifteen years experience in Australia with over 200 3G Football Turf fields installed, the sophistication of the design of the fields and the Football Turf systems have evolved but the maintenance has not evolved in the same manor with some approaches still vary antiquated. This Smart Guide explores ways that maintenance needs to change to address the variables we now have in a maturing Football Turf market, including:

- Yarn system type: Monofilament, tape or dual yarn combination
- Yarn length: 40m – 70m
- Infill type: Rubber, sand or organic
- Age: New, mature or ageing
- Location: Global, regional location and impact by weather and the environment
- Design considerations: Use of shockpad, adoption of microplastics mitigation and drainage strategies
- Intensity of usage: The number of hours, the number of players and the type of usage (drills, games, adults/children etc)
- Equipment availability: The type of equipment used to maintain the Football Turf
- Technology and monitoring: Embracement of technology to monitor usage and link to maintenance strategies.
- The pavement and drainage strategy for rain intensity days.

With most International Federations requirements, performance surface 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 manufacturer's manual is normally linked with their warrantee, with most manuals being generic and only address one of the variables, monofilament. These need to be updated and aligned with the Football Turf system for each site.

1.2. Key considerations for maintenance

The key considerations of maintenance should be focused into four key aspects

1.2.1. Design to reduce intensity of maintenance

By understanding how the Football Turf system works, the design can significantly reduce the level of maintenance needed and the frequency. The approach may include:

- Shockpad installation: By having a quality shockpad, (warranty over 20 years and made to EN 15330-4:2022 the amount of infill needed has been reduced significantly. Typically, an infill level without a shockpad would be 25kg/m² sand and 20kg/m² rubber/organic. With a shockpad it would be expected that the performance infill only needs to be 5-8kg/m².
- Yarn combination: By moving away from a monofilament yarn system to a tape or tape/monofilament dual yarn carpet the infill splash is reduced significantly (estimated to be greater than 75%). This should reduce the frequency of need to brush infill 'back into' the

high wear areas and the migrations of microplastics.

- Yarn and carpet structure: High quality thicker pile yarns are significantly more resistant to pile splitting and flattening. Carpets with higher stitch rates are more resistant to pile flattening, yarn splitting and infill dispersion;
- Synthetic turf systems that incorporate shockpads or elastic layers generally suffer less from infill compaction than systems without.
- Removal of spoon drains: Removed all surface drainage and design this to be subsurface under the carpet to ensure no infill migration into waterways.
- Microplastic migration mitigation: Adoption of Standards Australia / European Standards "SA TR CEN 17519:2021. Surfaces for sports areas. Synthetic turf sports facilities, Guidance on how to minimise infill dispersion into the environment". This provides design advice on how to contain microplastics (including infill) within the field of play.
- Player and vehicle entry points: To reduce migration of the infill and reduce dirt being brought onto the fields by boots, shoes and vehicle tyres, have brush trays.
- Facility Equipment: Rubbish bins positioned next to entrance gates, and upstands at base of fence line (200mm min) to alleviate wind blowing rubbish, leaves etc onto the field through the fence.
- Drainage strategy: To reduce infill floatage with a severe rain event consider the drainage strategy to be sufficient to cope with an intensity level in excess of the norm (suggest 1 – 50 year ARI with an intensity for 20 mins). This will reduce the probability of water pooling. By asking for double the normal holes in the latex backing or use of a mesh backing this will increase the porosity of the carpet. This should be considered for organic infill significantly as it floats easier than some rubber options.
- Pavement / Drainage strategy: Consider a vertical draining strategy sub-carpet, with a flat surface and the drainage mechanics is in the shape of the sub-base and pavement. The lack of on field gradient will ensure that there is no lateral surface movement of the water as all the gradient is in the pavement and sub-base.

1.2.2. Maintenance strategy specific for field of play

Too often asset owners are provided with a generic maintenance specification that has probably been used globally and is not specific for a site. In many manuals even the standard design pictures show only a monofilament grass, yet the majority of educated asset owners do not purchase these systems for open parkland fields anymore, yet the maintenance manuals still show them. There is an acknowledgment that this standardised approach needs to change.

The expected site specifics should include:

- Carpet type, dual yarn system
- Layout of site, especially goal area and type of goals used
- Infill type
- High wear areas, especially penalties, corner areas, gate access points, coaches boxes etc
- Age of the carpet / system – as the needs will change
- Intensity of usage and where each type of maintenance should be carried out
- Roles and responsibilities, who will do what maintenance
- Renovation strategy (e.g. infill top-ups etc)

1.2.3. Resource availability

The alignment of resources, skills and experiences are crucial to successful management of maintenance function: Section 4 explores the options in more detail. The key principles need to be:

- The type of maintenance needed and the machinery/equipment needed, whether that is a plastic rake, to add infill around penalty area, to machines needed for brushing and deep cleaning
- The inhouse skills and experience or should it be contracted out to a third party contractor
- Time, needs to be considered and programmed into the fields schedule
- Funding is critical for success within the annual budget and should include the routine maintenance (e.g. brushing), the programmed maintenance (e.g. deep cleans) and the end of season renovation (e.g. infill top-ups).

1.2.4. Monitoring and reviews of performance

Within the maintenance there needs to be regular monitoring and an annual review to ensure that the surface and surrounding areas are being well managed. Section 4 explains the detail and should include:

- Pre and post-match monitoring, including specifically after drills in a specific area that may need a top up
- Regular maintenance (e.g. brushing) and a record kept of what's been done
- Annual or post season review, before the renovation to prepare the field for the next 12 months and including any changes needed to ensure it reaches its age expectations.

2. General Maintenance Considerations

2.1. Introduction

Section 1 identifies the key aspects that will influence the amount, type and frequency that should be considered for a specific field, where this section explains the performance characteristics of the surface and impact that maintenance can have, the usage impacts and management considerations for a field.

2.2. System Impacts on Performance

The Football Turf system components will impact significantly on the maintenance and the following suggestions should be considered to reduce the level of maintenance.

1. **Carpet type**

We recommend that by purchasing a dual yarn system as opposed to a monofilament system for an open parkland the level of ball splash and migration of infill will be reduced if the yarn is a tape or tape/monofilament dual yarn system. This should reduce the need for the brushing to be reduced from fortnightly to monthly. The ideal yarn length would be between 50mm and 60mm, anything less (e.g. 40mm) will need great maintenance, due to infill migration or anything more (e.g. 70mm) has the tendency to have significant infill with needs more maintenance.

2. Yarn structure

In Australia the most common, open park field, system is the dual yarn (monofilament / tape) product, supplied by the majority of quality manufacturers. This encapsulates the infill and reduces the migration of the infill significantly (suggest by more than 70 %), one the fibrillated tape opens up after 3-6 months of usage.

The premise of the thicker the monofilament yarn (≥300µ) the more resistance the yarn has is accurate. Combined with the yarn weight this is important. Both will reduce movement, flattening of the yarn and therefore the level of maintenance.

3. Shockpad

In late 2014 The European Synthetic Turf Organisation (ESTC) produced a Research Paper, which stated:[1]

- *"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."*

The members of the ESTC shockpad working group stated they strongly advise that:

"when there is the smallest doubt the maintenance will not be done at the necessary level, a serious consideration has to be made to use a system with a shock pad and thus to keep the performance at an acceptable level during the lifetime and to eliminate as much as possible safety risks (injuries)".

This provides clarity around the debate on whether shockpads are critical or not. Therefore, we recommend shock pads for projects that have the following characteristics:

- The governing body of the sport encourages the use of shockpads;
- Where the participants could fall from heights such as Rugby Union and Australian Rules Football;
- Where there is any chance the level of maintenance may not be relative to the amount of usage on the field; and
- Where the field is in a public open space and likely to receive excessive and intense usage.

4. Seams

The Authors preference will be for all seams to be sown together as too many seams are seen to be coming apart after 6-8 years of usage. The following design aspects should be considered to reduce failing and therefore reduce reactive maintenance.

- Seams sewn together, if possible
- 300mm tape used on all seam joints to increase probability of joint integrity
- As many lines as possible to be tuffted in at the factory
- All 'non major lines' should be painted on with manufacturer approved paint

5. Infill type

With a move away from rubber and plastic infills due to the embracement of environmental good practice there are now a range of organic infills including cork, cork and coconut husk, walnut husk, wood chip, olive pips, corn husk and more will continue to be encouraged. Not all are available yet within Australia. As the nature of organic

[1] ESTO Shockpads Working Group: Information Update (11th Sept 2014)

material means that they will be easier to breakdown it is important that the right infills, and drainage strategy is chosen. Key to this is the need for the infill not to float, therefore the design of the drainage is critical to the ability to NOT have to reactively add more maintenance when there is heavy rain.
The key considerations will be,

- Porosity of the carpet to allow enough water through into the pavement/drainage cell. This should be maximised to ensure that adequate holes are punctured in the carpet backing and or a maximum porosity band is used.
- Drainage strategy, a flat base, with the vertical drainage angled under the carpet with collector drains is most probably the best option.
- Not that all contractors have the experience to build these. This flatness on top means that the organic infill will not 'float on grade' as the drainage cell strategy needs to do.

6. Key performance issues

If the field needs to be maintained to certain performance criteria such as FIFA or World Rugby certification it is important to appreciate what impacts on that criteria and how the maintenance can enhance and keep the field playing to the performance standards. Table 1 provides a summary of the influences of the surfaces playing characteristics:

Table 1: Influences on Performance Criteria

	Property	Carpet pile	Performance infill	Stabilising infill	Shockpad
Player safety	Shock absorption		✓	✓	✓
	Deformation		✓	✓	✓
	Rotational friction	✓	✓		
	Linear friction	✓	✓		
	Skin friction	✓	✓		
	Hic Test		✓	✓	✓
Playing qualities	Ball rebound	✓	✓	✓	✓
	Ball roll	✓	✓		
Construction	Water permeability	✓	✓	✓	✓
	Surface regularity		✓	✓	✓

The key performance issues that maintenance needs to address include:

- Pile flattening
- Infill migration
- Infill compaction
- Infill contamination
- Joint failures
- Algae and bacteria growth

7. Yarn flattening

The most common challenge facing field owners is that of pile flattening in high wear areas where there is insufficient infill levels to hold the yarn upright. The effects of this could include:

- Increased risk of skin burns, player dissatisfaction, infected wounds and compensation claims
- Low boot grip due to lack of stud penetration, player dissatisfaction and increased risk of injury
- Increased fibre wear and tuft loss, resulting in premature aging
- Excessive ball roll, surface becomes too fast and the biggest cause of FIFA Quality Certified field failures
- Inability to de-compact infill leading to loss of shock absorption, excessive ball bounce and reduced water permeability
- Glare – issue for TV and spectators in Stadia etc.

Photo 5: Line movement when there is not adequate infill and the cleaning machine goes over the lines it can stretch the surface

The causes of pile flattening include:

- Concentrated play in high wear areas for a field

- Use of flat soled sports shoes
- Low quality pile yarns
- Inadequate maintenance

There should be a contingency budget annually to address infill top up, as part of the renovation program.

8. Infill levels

The correct amount of infill is vital to the safety of players and performance of the field; too low and turf pile will be damaged and wear more quickly. Too high and players will find the surface unstable with inadequate grip which can result in serious injuries (e.g. ankle and ACL injuries) due to low rotational resistance and poor foot grip. Also, if too low there will be reduced shock absorption which could lead to higher risk of injury.

The infill also helps keep the pile standing upright which gives the desired ball pace and reduces the risk of carpet burns occurring. Ask the field installer for the recommended infill levels.

Be aware that high use areas are prone to greater infill displacement. Infill may accumulate at the edges of a field. If so, clean the material prior to brushing back into the main field. Higher stitch rates can assist with maintaining infill easier in high wear areas.

The preferred way to measure infill depth and consistency is to use an infill depth gauge. Drag mats and brushes can help redistribute infill evenly.

2.3. Usage impact of field and maintenance

2.3.1. Usage

The type and intensity of usage will have a significant impact on the maintenance needed for each field, as the greater the intensity, across the whole filed or in a specific area (e.g. penalty spot) will create greater wear and tear.

As the field ages, the maintenance will change, both in terms of functionality and ability to impact life expectancy. This is why it is critical to purchase the right Football Turf system for the type and intensity of usage.

Certain activities may have far more impact than others including:

- bicycle traffic, track and field events, golf activities, concerts;
- special events and activities should be reviewed with the field builder before the event occurs to ensure that damage is not prevalent;
- accidents, vandalism, spiked shoes, animals, wire brushes, fires, fireworks, floods;
- chemical reactions, the use of dry cleaning fluids or improper cleaning methods, high pressure sprays exceeding 500 psi, storage of heavy materials on the field, non-approved infill materials.

Footwear

Footwear: Suitable footwear should always be used. Metal spikes should be prohibited and cleats are preferred. Flat-soled rubber shoes greatly intensify the wear and tear on the synthetic turf.

Use patterns: It is very important to spread the field use to various locations on the field to prevent uneven or accelerated wear in certain areas.

Vehicles: Do not park vehicles on the field, especially in the heat of the day, or leave vehicles on a wet or hot field for long periods of time. Engine exhausts should not be faced down toward the playing field, and a hot muffler or exhaust pipe should not touch the surface. Use lighter vehicles with Low Ground Pressure tyres with round edges to prevent rutting. Do not use cleated or traction tyres. Heavy vehicles (over 150kg) should have a maximum tyre pressure of 2.5 bar (35 psi).

Concert stages and other non-sporting uses, etc.: Stage or other set-ups for special events or activities, such as graduations, are normal. Proper field protection of the synthetic turf must be provided to prevent damage. Use plywood, interlocking plastic panels or similar weight distributing materials under all chairs and tables – consult the manufacturer or a field protection company.

Photo 6: Terraplas field protector as used at Wembley Stadium (source: www.terraplas.com)

Use field protection that does not have a dimensional profile, e.g., corrugation, because the profile will transfer onto the turf and require heavy grooming to remove. It is imperative that no anchoring spikes, posts or footing be driven into the turf. Once the field protection is removed,

the area should be groomed and swept with a magnet to remove any misplaced or dropped nails, screws, etc.

2.3.2. Acceptable footwear for users

Some manufacturers and suppliers of long grass synthetic fields provide varied advice on the use of different types of footwear for synthetic fields. The UK's peak body, The Chartered Institute for the Management of Sport and Physical Activity's Guide Note: GNO11[2], produced the following table and recommendations, which will impact positively on the maintenance needs of surfaces.

Table 2: Acceptable Footwear

	Studs (Moulded)	Studs ≤15mm (Screw in)	Studs ≥15mm (Screw in)	Blades	Dimpled (e.g. Hockey Shoes)	Flat Soled (e.g. trainers)
3G / Long Grass	✓	✓	✓	×	×	×
Sand-dressed	×	×	×	×	✓	✓
Key:	✓ = Acceptable		× = Not acceptable			

Error! Reference source not found. should be used to educate the user as part of the booking procedure and on notice boards, detailing acceptable and not acceptable footwear; e.g.:

- Do: wear boots with a moulded stud;
- Do not: wear bladed boots;
- Do not: wear boots with metal studs; and
- Do not: wear flat soled trainers.

2.3.3. Playing in a new field

The dynamic nature of the infill during the first 2-3 months as is infill is 'settling-in' between fibres, it would not be normal to have it tested during this period. The best way of 'Playing In' the field is to use it continually, so that the infill settles down. During this time regular inspections and maintenance is required. There will likely be more displacement of infill than expected, this is normal. Brushing will correct this initial period, to ensure that the pile remains vertical after heavy use.

The Sports and Playing Contractors Association (SAPCA)[3] state for long grass fields "during construction every effort is made to ensure even distribution of infill over the whole pitch". Experience shows however that increasing the frequency of grooming, in the early weeks is beneficial in creating the final playing surface.

If areas are found which are short of infill, it should be possible to brush infill from adjacent areas of surplus material, provided this is conducted within the first four weeks. If the under-filled areas are extensive or do not respond to this treatment the installer should be called immediately, to add more infill.

When the settling-in period is over the pitch has reached its optimum playing condition, the frequency of grooming can be reduced.

2.3.4. Events on Football Turf

Some clients many consider the technology as being able to host major events including concerts and market days, which could have a detrimental impact on the surface unless the right protection is in place.

With a significant number of people wearing daily shoes they could damage the yarn, or with heels cause problems for the wearer as they would sink into the performance infill.

It is suggested that a Turf Protection System (TPS) be used that allows both vehicles to be used on the surface as well as daily shoes. This normally means the TPS rests on the infill and not the yarn, thus not bending the yarn over as this would reduce the life expectancy.

2.4. Education for users

Educating the users of the field in good practice is important for the maintenance regime of the field. Encourage users to wear the correct footwear, not to drop litter, gum and nut shells on the surface, to report areas of low infill, split carpet joints, etc.

[2] Acceptable sporting footwear of users of synthetic sports surfaces (Dec 2013), CIMSPA

[3] Code of Practice for the Maintenance of Synthetic Sports Surfaces – April 2004, SAPCA

Photo 7: Guidance for usage (source: Alastair Cox Associates)

Encourage users to consider the field is theirs and to treat it as if it was their responsibility.

- Do not allow users to wear boots with metal studs
- Do not allow users to wear bladed boots
- Do not allow users with flat soled trainers

3. Maintenance Equipment

The equipment needed to maintain synthetic surfaces is specialised and designed to complement the synthetic surface technology and the maintenance challenges that the technology may face. Some of the equipment can be attached to wide-wheeled tractors or ride-on machines, whilst others are specific machines for specific tasks. This section explores some of the equipment, what it is used for.

3.1. Inspection Tools

- Free Pile Height Gauge

Ensuring the pile of the synthetic turf surface is standing upright is important for sports such as football where the speed of the surface is controlled by the resistance the turf's pile offers to a rolling ball. In addition to other sports where carpet burns can occur if the pile is standing upright. As a result, players slide across the plastic pile and not through the mobile infill.

A simple way of checking if the pile is standing vertically is with a Free Pile Height Gauge.

Photo 8: Free Pile Height Gauge

- **Infill Depth Gauge**

Ensuring the correct depth of infill is present within the synthetic turf surface is essential if the correct levels of impact protection and ball response are to be provided by the surface.

A simple Infill Depth Gauge can be used by the Grounds Staff to check infill depths across a field.

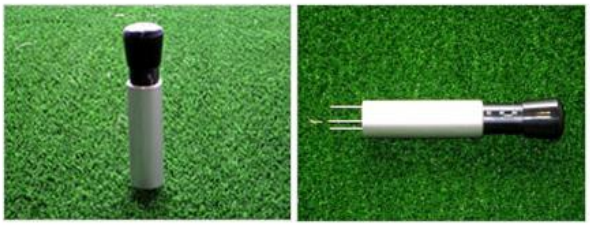


Photo 9: Infill Depth Gauge

3.2. Brushing Equipment

The pile of the synthetic turf will flatten through use, the degree this occurs will depend on the levels of use and types of footwear being worn by players. Lifting the pile is essential to retain optimum playing conditions.

Whilst there are many different types of brushes on the market, research has shown that oscillating brushes and rotating brushes are the most effective.

The main focus of brushing equipment is to ensure uniformity of the surface and in doing so brushes displace infill to the acceptable level.

Photo 10: Tines being used to decompact infill and redistribute infill

A number of designs are used with different degrees of effectiveness, including drag brushes, triangular in design; 'S' shaped and straight edged. Some designs are integrated with a complete cleaning machine; others can be attached behind small tractors or garden machines.

The brushes have a number of purposes:

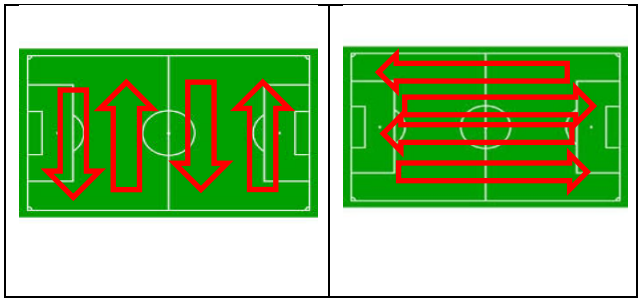
- Uniformity of surface level of infill;
- Prevention of yarn lean or yarn flattening;
- Collection of larger pieces of debris/rubbish;
- Reduction of surface area of the yarn exposed to UV radiation;
- Utilisation of oscillating brushes which are becoming more common. They are hydraulically controlled and

rotate forward and in reverse. These brushes are especially effective for raising the yarns. Emphasis of use would be in high wear and use areas of the field around the penalty spot, goal area, corner flags, centre circle, Ref side lines etc. A field should be walked first to ensure that the right kind of brushing is done for the right area;

- Provision of a drag mat. A traditional way of redistributing infill that has been displaced is using either a drag mat, with many maintenance companies now finding the benefits of a power brush instead of the Drag Mat; and
- Friction Sweeper - An alternative to a drag mat is the use of a Friction Sweeper, which is far softer than a drag mat and which can quickly be dragged behind a small machine over a field to pick up all organic matter, litter, and obstructions as opposed to just walking the field daily. A good option.

Photo 11: Friction Sweeper – Soft grass covered under-surface (source: Friction Sweepers International)

Brushing should be conducted in dry and not in wet weather. It is recommended that the field is groomed (brushed) in four directions each time as shown below to maximize the effectiveness of brushing. The Manufacturers Manual should guide the approach specific for each installation.



In addition, the oscillation brush should be used initially in high-wear areas in both a forward/reverse direction to get the fibres standing.

In some football codes such as Rugby League and Rugby Union where skin friction is more important than say Football (Soccer) the yarn needs to be vertically standing so that the skin does not rub against the whole yarn, if folded over. Some manufacturers are developing the yarn so that it is soft, but thicker and can stand upright longer.

If you were having a game of Rugby Union of League than before the games at a weekend it may be worth considering using the Oscillating Brushes to ensure that the yarn is upright.

3.3. Power Brushing

Specialised machinery has now been designed and integrated machines are now available for users.

The majority of quality/suppliers offer this surface to their clients. The power-brushing have several purposes:

- Removes any contamination in the first 2-5mm of infill;
- Improves fibre and infill uniformity, with drag brush attachments;
- Provides oscillating brushing;
- Decompacts the infill by using a tine attachment; and
- Vacuums up impurities.

Photo 12: Oscillation brush machine

3.4. Vehicle Use on Field

Depending upon the base design, it would be expected that the field should be able to withstand the weight of a medium sized vehicle (e.g. Ambulance, Cherry Picker etc.). That said the way that the vehicles are driven on the field is important to the maintenance to the field, to reduce the risk of causing damage to the synthetic sports turf. The following recommendations are made:

- Ensure that the pavement base is designed to accommodate the weight of an ambulance, normally the load bearing pressure of 480kpa;
- Vehicles to be fitted with the pneumatic rubber tyres as normal road tyres will most likely damage the surfaces and base;
- Turning of the wheels should NOT be started while the vehicle is in a static position, as this will both displace the infill and can rip the yarn out of the backing;
- Turning of the vehicle should be on a wide radius;
- Drive at a constant slow speed, avoiding heavy breaking, sudden acceleration and spinning of the wheels;
- Ensure that the vehicle wheels are clean before they enter the field of play, so that no organic matter is transported onto the field.; and
- Check that there is no leaks of oil or hydraulic fluid before the vehicle enters the field of play.

3.5. Vehicle Leaks and Spills

Prevent leaks or spills by checking equipment and its components thoroughly before use on turf; do not fill fuels, oils, fluids while equipment is on the field. Wipe any excess grease from any/all fittings. Petroleum-based spills can damage the synthetic turf.

Use only the newer biodegradable forms of Hydraulic fluid, if available for your equipment – do not use petroleum-based fluids. Check with the equipment manufacturer to verify if biodegradable fluid is compatible with the equipment and its warranty.

If a leak occurs when using petroleum-based fluids, it is important to minimise the damage by stopping and capturing as much fluid as possible. If it leaks on the turf, use spill leak towels to soak up the majority of the fluid. Vacuum the infill in the affected area and use a solution of household dishwashing liquid and water to break down and clean any remaining fluid from the turf. Once the turf is clean, a new infill will be required to install.

Do not refuel equipment while it is on the synthetic turf; do not overfill as newer equipment has an overflow tube that drains directly under the equipment and onto the ground. Use a catch pan while filling to prevent accidental spillage.

Use grease sparingly and wipe any excess off all fittings, bearings, chains, etc.

3.6. Spare Performance Infill

The performance infill (normally some form of rubber granules) will be dislodged from the surface, especially in high use areas such as penalty and corner spots. These areas should be topped up to their optimum depth as and when required. Infill needs to be left on site at handover for ongoing top ups and the site needs to allow for suitable storage of it on site – 3 Tonnes is the amount recommended at handover of a standard pitch football field (8,500m^2) these days. It is sometimes hard to get the virgin rubbers so keep them on site to allow the maintenance company and club to have access to the top up material.

There will be a need to do a significant top up at some point in the field's life and the associated costs – 5-10 Tonnes at about 4-5 years has been the experience of one of Australia's leading companies experience to date. Sometimes sooner on fields that are not well maintained, and field owners need to be prepared for this need.

3.7. Boot Cleaners and Entrance Mats

Minimise the risk of dirt and contaminates entering the playing surface by providing boot a cleaning kit as below, for players to use as they approach the field.

Consider access ways – where possible prevent players from walking across dirt or grass areas to reach an entrance gate.

Photo 13: Pedestrian gate mats that capture the infill (e.g. _____)

3.8. Goal Posts and Maintenance

Consider Sporting Equipment that is on the field e.g. – on soccer fields the main goals should be a hinged system, so you can fold up the net and groom behind easily.

Temporary goals are important for the game and skill development but the weighted bags that are needed to ensure that they don't topple over are normally sandbags (filled with sand or other heavy contents. These should be put away at the end of each session off the field of play to ensure that the bags do not split and contaminate the infill flatten the yarn.

4. Maintenance for Long Turf

4.1. Introduction

Maintenance can be scheduled into a seasonal or annual program linked to usage, with regular maintenance (suggest one hour) linked to every 10 hours of play. It is recommended by some commercial operators[4] to have two to three hours maintenance weekly for every 30 hours use for long (3G) grass usage. Although FIFA suggest weekly[5], our view is that it needs to be linked to:

- The level of use per week;
- The type of usage (e.g. adult, junior);
- Intensity of the area used (e.g. 5-a-side needs more than 11-a-side); and
- The type of sport activity (e.g. Rugby scrums will impact surface displacement).

4.2. Initial Maintenance and Settling In Period

After the field is handed over from the installer / builder the infill needs approximately 40 hours of play to 'settle the system in'. This normally allows the infill to be firmed up and reduce in height as it receives a gentle compaction with the initial usage. Many clients invite the local school children to play on it for a few days to get the feet running over it.

This many mean that the initial look of the fields may look a little overfilled on handover, but with the initial usage this should settle down accordingly. The independent Test Institute shouldn't come and test until after this 'settling in period' to ensure that the test results are more accurate.

A handover meeting on the field attended by all stakeholders is critical, it allows a Q&A session, a maintenance demonstration and consensus agreement on who will be responsible for what.

4.3. Routine Maintenance

Whatever the circumstances, a regular monitoring inspection will identify the routine needed for each specific field. Table 3 provides some guidelines.

Table 3: Guidelines for Maintenance

Suggested Routine Tasks	Playing Hours Per Week		
	<20hrs	20-40hrs	≥40hrs
Pitch inspection monitoring	Daily	Daily	Daily
Litter removal	Daily	Daily	Daily
Refilling high-wear areas	Weekly	Weekly	2 times a week**
Drag brushing heavily used areas - monofilament	Monthly	Fortnightly	Weekly
Drag brushing heavily used areas – dual yarn	Monthly	Monthly	3-4 weeks
Rotating Brush – high-wear areas	Quarterly	Monthly	Weekly to Fortnightly
Osculating Brush – high wear areas	Quarterly	Monthly or as needed	Monthly or as needed
Rotating Brush – whole pitch	Six monthly	Quarterly	Monthly or as needed
Weed/moss/algae treatment	Annually	Annually	Annually
Seams inspection	2 weeks	2 weeks	2 weeks
Surface de-compaction	Seasonally	Seasonally	Quarterly or 6 monthly***
Renovations	Seasonally	Seasonally	Seasonally

*** we would strongly recommend that after heavy use, e.g. training or end of matches that the high wear areas are topped up and brushed in.*

**** if dual yarn carpet*

4.4. Daily Maintenance and Monitoring Checks

Prevention is the best science to prolong the life of a field. This starts each day when someone should walk the field of play to ensure that it is safe for the next user and identify any simple maintenance rectifications needed (e.g. penalty spot top up).

Either ground staff or a club representative should walk the field and maintain the surface, including:

- Removing any sharp objects from the surface, e.g. glass, syringes, metal, plastics etc.
- Remove large pieces of organic matter e.g. twigs, spoil by the gates etc.
- Top-up areas around penalty area, corner flags, line out areas with performance infill and sand

[4] Long Pile Synthetic Sporting Surfaces Maintenance Manual (2014) - Grassports

[5] FIFA Maintenance Guide (FIFA Maintenance Portal – sourced Nov 2014)

- Check the equipment – such as the goalposts, nets, interchange boxes ensuring that equipment is safe and not damaged

When applying 'top-up' infill it is suggested that the applicator should use a medium stiff brush or general plastic leaf rake, to agitate the yarn before sowing the infill into the carpet, then rake over and then sow again evening in the depleted area. Gently do this enough times until the infill stands slightly proud of the rest of the infill around it. The walk across it a few times to softly compact it until it is the same level as its surrounding infill. Then lastly apply the soft brush to bring the fibres upright again.

4.5. Groom the Surface

Regular brushing is an important function that must not be overlooked or neglected. Brushing helps to maintain uniform infill levels, keep the grass fibres upright, remove debris, and improve the field appearance.

Photo 14: Brushes towed behind small tractor machine is better than a drag mat

Conversely, the flattening of grass fibres will increase the pace of the surface consequently the field no longer plays like a natural turf field, increases the risk of carpet burns when players slide on flattened pile, and can create a possible acceleration of wearing of the playing surface, thus shortening its life.

Use only synthetic fibre bristles of recommended stiffness. Do not use metal or wire bristles. Ensure the bristles are set to the correct depth so they do not:

- Snag the pile tufts and pull them out of the carpet backing;
- Tear the backing of the synthetic turf carpet; and
- Pull the stabilising sand layer from the bottom of the infill to the surface.

The brushes can be mounted to specialist plant or behind a general tractor (or mini-tractor) unit. To avoid the risk of contaminating the playing surface the tractor should only be used on synthetic turf surfaces. The use of six - wheel vehicles is not recommended.

Do not use maintenance equipment before receiving proper use and safety training. Use equipment and vehicles that are approved by the field builder.

Frequency: Ask your manufacturer for the recommended grooming frequency. In general, the frequency will be related to the intensity of use; however, excessive brushing can cause fibre damage which over time will compromise the field's performance characteristics and longevity.

Method: An average all-purpose vehicle that brushes a standard sized football field will take about an hour and a half. The vehicle speed should be low and sharp turns must be avoided.

Direction of Brushing: The surface should be brushed in a number of directions, alternating the direction for each maintenance programme, but generally in the direction of the individual panels to avoid crossing over the main seams. On different days, start at different locations so as to alternate the brushing direction for each panel (see Section 2).

Brush Height Setting: The optimum brush height setting will depend on the model and type of equipment. Do not set the brush so low that it digs into the turf pile or backing. Too low a setting can damage the turf, the seams and disturb the infill.

Photo 15: Modern machine providing height options for the tines to be used into the turf by an experienced operator

Time: It will typically take around two hours to thoroughly walk and check the field and then groom a full-size football / rugby field.

4.6. Ageing Surface

As the Football Turf ages the users will probably notice more:

- Seams starting to spilt, especially if infill levels are not kept high;
- Compaction, especially on high wear areas and need to decompact
- Fibrillation of the yarn, the greater the fence height and lower infill the more you will see.
- Need for greater infill top up across the whole field

If a dual-yarn system is used the need for continual brushing (fortnightly) will be reduced, therefore the harsh cleaning on the surface will be reduced and should have less breakdown of the yarn.

4.7. Scheduled Maintenance

Over the life of the synthetic turf system, the system may need further scheduled maintenance and remediation. The 'tell-tale signs' of this may include the following points and may be noticed more frequently in the regular monitoring inspections:

- Yarn becoming significantly bent, flattened and not standing upright;
- Playing surface becoming hardened and more compacted;
- Dirt and debris accumulating within the infill and between the yarn, despite the routine maintenance being performed;
- Seams are becoming loose; and
- Infill levels are becoming more uneven and stay in this position for a longer period.

Photo 16: Vandalism can entail a whole section being cut out and replaced

Photo17: The yarn has been exposed to UV and the tips are breaking down and covering the maintenance machine

These are signs that specialist work needs to be performed and may include:

- Professional field inspections – development of a corrective action plan that identifies the effect and the cause, with strategies to address the problems;
- Decompaction of infill – using specialised equipment (e.g. SMG SportChamp) designed to decompact the infill, which will assist with playing performance of the system with the ball and the player's boots;
- Major rejuvenation – measuring the infill depth against the supplier's recommendations and then redistributing or 'topping-up' in key areas;
- Deep cleaning – using specialist equipment to brush and vacuum the contaminants from the infill; and
- Removal and reinstallation – if the field has become significantly impacted, specialist machines can remove key amounts of infill, clean and then replace it by removing embedded contaminants and decompacting the system, thus improving performance and drainage.

Metal Removal

Use a magnet attached to the maintenance equipment to remove ferrous metal objects from the field.

Photo 18: Machinery including the metal magnet at rear

4.8. Replacement of Higher Wear Areas

High wear areas (penalty spots and corner markings are likely to wear more rapidly than the surrounding field); especially if infill levels are not regularly topped up. If left unattended, these areas will eventually tear and become a safety hazard to players.

Localised patching can be conducted when these areas show signs of significant wear. To reduce the rate of wearing, consider using a reinforced carpet panel. To minimise colour differences, it is suggested samples of carpet for patching be obtained when the field is initially laid.

Photo 19: Replacement penalty spot due to excessive wear

4.9. Static Electricity

In hot dry conditions, static electricity can cause the infill to stick to the pile yarns and increase infill migration. Surfactants like liquid laundry fabric softeners can be applied to the surface to reduce static electricity.

4.10. Microplastics

Microplastics (infill migration and now fibre wear) is receiving increasing media and political attention in Europe. Much of this is due to poor maintenance practices when moving snow, but equally migration through dispersion on clothing, flooding, etc. is a cause. The latest consultant's report[6] prepared by the EU states that 72,000 tons of infill are dispersed annually through Europe.

In Australia we have seen several strategies being recommended to reduce the breakdown of the fibre and loss of the infill including:

- Grates and carpets at the entry and exit points around the field of play to reduce the level of infill leaving the field;
- Basket strainers pre the storm water exits to capture any movement;
- Using soft drag mats as on older fields the UV component mix is not as high, and the tips of the yarn have been slowly damaged and broken with the heavy rubber ones; and
- Increased UV testing for the yarn in Australia

4.11. Maintenance Log

The Maintenance Log should be provided by the Field Supplier and is normally linked to the Warranty of the field, which means that completion of this Logbook is critical, not only when you first receive the field but for every day, week and month until the field is replaced. It is also a condition of the FIFA certification program and it is good practice to show that the field is being maintained.

Typically, a Logbook would record this following information, and a more sophisticated form can be seen below.

Synthetic turf field maintenance log				
Usage			Maintenance	
Date	Hours of play	No. of players	Maintenance activity	Operator
12/6/13	4	22	Field inspection, localised infill top up	GW
13/6/13	6	3 x 16		
14/6/14	7	3 x 16	Field inspection, localised infill top up & grooming and drag mat	FS
15/6/14	5	22		
16/6/14	4	3 x 16	Field inspection, localised infill top up	GW
17/6/14	7	2 x 16		
18/6/14	6	3 x 16	Field inspection, localised infill top up & grooming and drag mat	GW

Figure 1: Typical logbook record

4.12. Annual Review

To conduct an annual review of the field, walk the field, approximately every 3-5m apart and with a dozen passes, key issues should be identified.

Smart Connection Consultancy normally walk by sliding our shoes along, to enable the feel of anything under foot, work shoes are better than trainers.

What items to look for:

- Flattened grass in high wear areas;
- Seam joins parting and in need of re-sewing or regluing together;
- Trip hazards around penalty spots, corner flags or areas where high build-up of infill which has been displaced from middle of field;
- Compaction of infill;

[6] Swedish sources and pathways for microplastics to the marine environment A review of existing data (Kerstin Magnusson, Karin Eliasson, Anna Fråne, Kalle Haikonen, Johan Hultén, Mikael Olshammar, Johanna Stadmark, Anais Voisin; March 2017)

- Additional wear areas, such as goal lines, white lines, goal box, etc.;
- Any defibrillation of yarn fibres in high wear areas such as goal mouths, line referees on side of field etc.; and
- Displacement of infill from high wear areas.

By taking a scaled drawing during the walk of the field, key issues can be identified and compared annually.

The drawing will also act as evidence to develop a strategy for any repairs or increased maintenance regime.

Smart Connection Consultancy can complete these on behalf of clients and ensure that the field can have the best chance of achieving its life expectancy.

4.13 Impact of System on Maintenance

By adopting the suggestions within this Guide, they should impact on the frequency of maintenance throughout the year, and life expectancy. This should be reflected in this specification used to procure a price and quote, the maintenance manual provided by the manufacturer and installer.

To summarise, the following should be considered

Routine Maintenance	Rubber Infill		Organic Infill	
1st Year	Monofilament	Mono/Tape Dual Yarn	Monofilament	Mono/Tape Dual Yarn
Brusing – cleaning / litter removal	Weekly	Fortnightly after tape 'opens up'	Weekly	Fortnightly after tape 'opens up'
Grooming / Drag brushing to return infill	2 weeks	4 weeks	2 weeks	4 weeks
Clean up outside of fence / microplastics	2 weeks	4 weeks	2 weeks	4 weeks
High wear area decompaction	3 months	6 months	3 months	6 months
Weed/moss/algae treatment	Annually	Annually	Annually	Annually
Infill top-up	High level end of season	Low level end of season	Very high level end of season	High level end of season
Years 2-5				
Brusing – cleaning / litter removal	Fortnightly	Monthly	Fortnightly	Monthly
Grooming / Drag brushing to return infill	Monthly	6 weeks	Monthly	6 weeks
Clean up outside of fence / microplastics	Fortnightly	4-6 weeks	Fortnightly	4-6 weeks
High wear area decompaction	3 months	6 months	3 months	6 months
Weed/moss/algae treatment	Annually	Annually	Annually	Annually
Infill top-up	Very high level end of season	Low level end of season	Very high level end of season	High level end of season
Years 5 - 10				
Brusing – cleaning / litter removal	Fortnightly	Monthly	Fortnightly	Monthly
Grooming / Drag brushing to return infill	Monthly	6 weeks	Monthly	6 weeks
Clean up outside of fence / microplastics	2 weeks	4 weeks	2 weeks	4 weeks
High wear area decompaction	3 months	6 months	3 months	6 months
Weed/moss/algae treatment	Annually	Annually	Annually	Annually
Infill top-up	Very high level end of season	Low level end of season	Very high level end of season	High level end of season

5. Key Contacts

5.1. Independent Advisory Services

Smart Connection Consultancy

Martin Sheppard, Managing Director

Suite 40, 204-218 Dryburgh Street

North Melbourne VIC 3051

p: (03) 9421 0133

e: martins@smartconnection.net.au

w: www.smartconnection.net.au

Consultant to all Football Codes in Australia

5.2. Key Sports

Football Australia (Football)

Level 22, Oxford Street

Darlinghurst NSW 2010

p: (02) 8020 4021

w: www.footballaustralia.com.au

National Rugby League Limited (NRL)

Luke Ellis, Participation, Pathways and Game Development

Rugby League Central, Driver Avenue

Moore Park NSW 2021

p: (02) 9359 8500

e: lellis@nrl.com.au

w: www.nrl.com

Rugby Australia (RA)

Michael Procajlo, Head of Game Development

Rugby Australia Building

Cnr Moore Park Road and Driver Ave

Moore Park NSW 2021

p: (02) 8005 5555

e: Michael.Procajlo@rugby.com.au

w: www.rugbyaustralia.com.au

Australian Football League (AFL)

Amber Koster, Planning & Investment Lead

AFL House, 140 Harbour Esplanade

Docklands VIC 3008

p: (03) 8341 6085

e: Amber.Koster@afl.com.au

w: www.afl.com.au

Gridiron Australia

Wade Kelly, Chief Executive Officer

1/12 Waterloo Road

Collingwood, VIC, 3066

e: info@ga.org.au

w: www.gridiron.org.au

Touch Football Australia

Jamie O'Connor, Chief Executive Officer

6 Makin Place

Deakin ACT 2600

p: (02) 6212 2800

e: jamie.oconnor@touchfootball.com.au

w: www.touchfootball.com.au

Australian Oztag

Bill Harrigan, Chief Executive Officer

PO Box 703

Cronulla NSW 2230

p: (02) 9562 8633

e: info@oztag.com.au

w: www.oztag.com.au

5.3. 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

Warehouse C
2 Kookaburra Rd North
Prestons NSW 2170

e: info@fieldturf.com.au

w: www.fieldturf.com

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

Grassports Australia

1/38 Green Street

Doveton VIC 3177

p: (03) 9792 0622

e: info@grassports.com.au

w: www.grassports.com.au

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

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

Limonta Sport Australia
Unit 2/165 Morphett Road
North Plympton, SA, 5037
p: 1300 769 499
e: info@limontasport.com
w: www.limontasport.com

Limonta Australia the agent for the Limonta is a:

- FIFA Preferred Producer
- World Rugby Preferred Provider

HG Sports Turf Australia

Suite 2, Level 1, 526 Whitehorse Road

Mitcham VIC 3132

p: (03) 9329 8154

e: info@hgsportsturf.com.au

w: www.hgsportsturf.com.au

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

Polytan

Factory 3, Dunlopillo Drive

Dandenong South VIC 3175

p: (03) 8792 8000

e: enquiry@polytan.com.au

w: www.polytan.com.au

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

Synergy Turf Manufacturing

165 Prospect Highway

Seven Hills NSW 2147

p: 1300 796 100

e: help@synergyturf.com.au

w: www.synergyturf.com.au

Synergy Turf is the agent and Australian manufacturer for Greenfields, recognised as:

- FIFA Preferred Producer
- World Rugby Preferred Provider

TigerTurf Australia

15 Macquarie Drive

Thomastown VIC 3074

p: 1800 802 570

e: auinfo@tigerturf.com

w: www.tigerturf.com

TigerTurf is a FIFA Licensee

Tuff Group

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 Preferred Producer
- World Rugby Preferred Provider

Turf One / Bild

Unit 12/89 Simcock Avenue

Spotswood VIC 3015

p: (03) 9719 1900

e: info@turfone.com.au

w: www.turfone.com.au

Turf One is an agent for the FieldTurf products. FieldTurf is a:

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

5.4. 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

5.5. Other Useful Contacts

Smart Connection Consultancy

www.smartconnection.net.au

5.5.1. Global Peak Bodies for Synthetic Turf

Synthetic Turf Council (STC, USA)

www.syntheticturfcouncil.org

European Synthetic Turf Council (ETSC, Europe)

www.estc.info

Sports and Play Industry Association (SAPIA, AUS)

www.sapia.org.au

Sports and Play Contractors Association (SAPCA, UK)

http://www.sapca.org.uk/

International Association for Aquatics and Leisure Facilities (IAKS)

https://www.iaks.org/

5.5.2. International Sports Federations

Football/Soccer – FIFA - Quality Program for Football Turf

http://quality.fifa.com/en/About-the-programme/

Rugby Union – World Rugby - Rugby Turf Program

http://playerwelfare.worldrugby.org/rugbyturf

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	

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 the Rugby Australia, Football Federation Australia, the National Rugby League and sits on the AFL technical committee.

> "Smart Connection Consultancy has been an invaluable source of information for both the federation and our affiliated clubs. Martin specifically has responded to requests at short notice, provided valuable insights and produced quality pieces of work that haves allowed the football community to achieve deadlines and desired outcomes – we will certainly be using him again".
>
> *Football Victoria*

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.

We work with synthetic and natural surfaces for the following sports facilities:

- Australian Rules Football Ovals
- Athletics Tracks
- Bowling Greens
- Cricket Fields and Wickets
- Football (11-a-side, Futsal and 5-a-side)
- Golf Courses
- Hockey Fields
- Multi-sports Areas
- Rugby Union Fields
- Rugby League Fields
- Tennis Facilities

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.

We offer the industry and our client's advice, mentoring and knowledge sharing so they can contextualise the opportunity and strategically consider options. Our approach provides rigor and we use independent research as a base to ensure that the most appropriate options are determined.

These services include:

- Knowledge sharing master classes
- Planning and facility development workshops
- Business case workshops linked to Whole of Life Asset management costing strategies and income generation strategies
- Sports participation growth strategies linked to synthetic surfaces
- Synthetic field installation tours - Practical reality
- National Sports Convention

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. Our offering includes:

- Financial strategy development to address WOL costings
- Funding applications for government grants
- Funding solutions with major lending institutes

We understand the use of supply modelling by using demographics of the local community, the needs and the opportunities for activating and retaining them in active recreation and sport which is paramount for a Feasibility Study or Business Case.

Our supply and demand modelling is critical in determining the needs for sports facilities, including:

- Supply and demand analysis
- Community consultation options

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.

Smart Connection Consultancy has been collaborating with SportEng since 20016 to provide the civil engineering aspect of each design and procurement project. Our collaboration can offer:

- Stakeholder consultation and technical approval
- Concept design options and strategy
- 3D design and fly through options
- Geotech analysis and assessment
- Council presentations
- Cost estimate for concept design

We can mentor your team to understand how to best manage the facilities once built, as this is vital if the funding is based on your organisation's ability to generate revenue.

We can support program development and provide advice on how to maximise the balance between club, school, commercial and your own programs, including:

- Program development strategies
- Price benchmarking
- Performance reviews

Photo 1: Moore Park Multi-sports field (NSW)

Procurement and Project Management Support

Over 20 years' experience in procurement and in collaboration with SPORTENG we offer a full procurement service. These services include:

- Procurement strategy development
- EOI and RFT document development
- Design & Construct or Detailed Design options
- Tender evaluation facilitation
- Comprehensive tender evaluation tools to ensure a rigorous and transparent process to procure the best product which is fit for purpose and achieves best value for the community

Collaborating 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, including:

- Site inspections and reports
- Witness and critical hold points
- Respond to construction RFI's
- Attend practical completion and defect inspections
- Site assessments and conditional audits

Photo 2: Chatswood High School NSW

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 – NRL, AFL, Hockey Australia, Football Australia, and State bodies
- Local Governments in Victoria, NSW, ACT, Qld, WA.
- Universities and Schools across the Country

Additional Organisations include – Mariners FC, Macarthur Football Association, Delfin Lend Lease, Veneto Club, Monash University, Southern Cross University, Queensland University of Technology and University of Queensland.

Smart Synthetic Sports Field Health Check

Review your field, understand risks and extend life expectancy

Australia's leading synthetic sports surface consultancy is offering the **Smart Synthetic 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 football fields (all codes) developed and installed in Australia in the past decade. We work closely with our clients to maximise their usage and life expectancy of their fields.

The Smart Synthetic 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;
- Predicting life expectancy; and
- Replacement costings and modelling.

An 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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