



maximising sporting opportunities

Gen 2

multi-sports areas

FLH

Sports Pitch Design Guidance

Introduction

Ensuring a sports facility is sustainable is often crucial to its funding and long-term success, whilst, for others, maximising the use of available space is the key to increasing sport's provision in a neighbourhood.

These trends are increasingly making the concept of multi-sports fields and courts attractive to those investing and funding community and education sports facilities. However, not all sports can be played on the same types of surface and a significant factor in the long-term success of a facility is ensuring it caters for sports that can be satisfactorily played on the same surface.

Hockey has evolved from a sport that was played on natural grass to the fast, technically skilful sport we see today. Utilising the well proven technology of second generation (Gen 2) short pile synthetic turf and textile sports surfaces, but incorporating innovations in manufacturing and construction techniques, it is now possible to modify these surfaces so they can also be used by other sports.

Tennis is played on a wide range of surfaces and, at the community level, asphalt or concrete are often used due to their performance, durability and relatively low cost. Such surfaces are also commonly used and endorsed by netball. Both sports recognise the benefits of using facilities on which hockey can also be played, meaning there is a diverse multi-sport option, often with floodlighting, that maximises use and provides community sports facilities that are suitable for all genders and age groups.

This guide, produced by the International Hockey Federation (FIH) in partnership with England Hockey, England Netball and the Lawn Tennis Association (LTA), and endorsed by Sport England, the European Hockey

Federation and International Tennis Federation is intended to share design concepts that promote good practice and encourage the development of facilities that all the sports can benefit from.

Facility operators are encouraged to consider that, although focusing on hockey, tennis, netball and Hockey5s, Gen 2 pitches can also be used for many other sports and activities including:

- Futsal
- Mini-soccer
- Lacrosse
- Softball
- Korfball
- Athletics training

Hockey5s is the official short-form version of Hockey. It is played by five players per side and condenses the best aspects of hockey into an action-packed, skilful and fun game. Ideally the playing area of a Hockey5s court is defined by rebound boards, which form an important part of the game as they keep the ball in play. Where this is not practical the game can be played to side and end markings. On 11 a-side fields and higher level competition courts the boards are positioned on the playing surface and perimeter margins lie outside them. On community and multi-sport courts the boards often form part of the perimeter fencing.

Many sports governing bodies now provide guidance, and in many cases performance and quality standards, for the surfaces on which their sports are played; these have been incorporated into this guide.



Playing surfaces

Whenever a multi-sport facility is being planned, there will probably have to be compromises in the sporting qualities of the playing surface. The key to success is ensuring that the compromises do not result in an unsatisfactory playing experience.

Sand dressed synthetic turfs are short, dense piled carpets that are partly filled with sand. When laid on the correct type of shockpad they provide a very good surface for hockey, with suitable properties for tennis, netball and other sports.



Textile sports surfaces are manufactured using a needle-punch technique that produces a thick fleece-like surface that is normally partly filled with sand. The surface is quite firm, which allows a ball to bounce to a reasonable height, making it particularly suitable for tennis.



Both forms of surface will normally be laid on a shockpad that provides the impact absorption required to protect players running and falling on the surface. This needs to be designed to ensure that, whilst providing the necessary protection for players, it does not adversely affect the bounce of a tennis ball to the degree tennis cannot be played.

Therefore, to ensure suitable hockey performance, player comfort and surface durability it is recommended the combination of playing surface and shockpad comply with the *FIH Hockey Turf and Field Standards Part 2* as follows:

Sports to be played	Category of FIH Approved Product
Hockey, Futsal, small sided football, lacrosse, etc	Multi-sport Category 1
Hockey, Netball, Tennis	Multi-sport Category 2

The FIH maintain an online list of surfaces that have been independently tested and shown to comply with their standard at www.fih.ch/hockeyturf.

In addition, when a facility is to be used for tennis and/or netball the combination of playing surface and shockpad should be able to comply with the following requirements:

Property	Test method	Requirements
% of pile height above infill	-	≥ 25%
Shock Absorption (dry and wet)	EN TS 16717	30% – 50%
Tennis Ball Rebound (dry and wet)	EN 12335	≥ 80%
Tennis Court Pace* (dry)	ITF CS01/02	Court Pace Rating 1 – 5
Netball Slip Resistance (dry and wet)	EN 16837	≥ 75
Netball & Tennis Rotational Resistance (dry and wet)	EN 15301-1 using test sole B)	25Nm – 45Nm

* The ITF categorise the Court Pace Ratings of a surface as follows:

Category 1	Slow	Category 4	Medium-fast
Category 2	Medium-slow	Category 5	Fast
Category 3	Medium		

Layouts & dimensions

For some, the desire will be to maximise the number of tennis or netball courts that can be accommodated on a full-size hockey field. For others, there will be a wish to minimise the detrimental effects of additional line markings on the field of play and increased wear in the shooting circles of the hockey pitch. A number of alternative layout options have been developed, to stimulate discussions on what will work best for a specific project; the key is finding a solution that works for all the different sports being catered for, without compromising on player safety, playability or longevity.

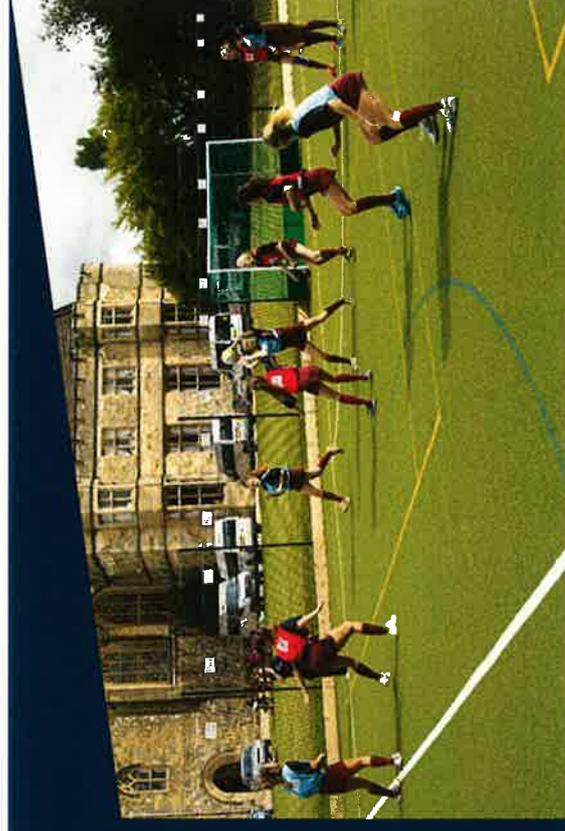
Depending on the size of the facility a combination of sports can be accommodated. The layouts included in this guide can accommodate a combination of:

- Hockey, hockey training and Hockey5s (the boundaries of the court being either portable rebound boards on a full-size pitch or boards mounted to the perimeter fencing on smaller areas)

"Gen 2 sports facilities allow you to maximise opportunities, providing cost effective solutions for a range of activities."

- Tennis and mini-tennis (using portable nets and the tennis court markings)
- Netball and High Fives
- Futsal

All the illustrated layouts are based on satisfying the minimum run-off recommendations of the various sports.



The following table details the key dimensions for each of the three main sports detailed in this guide. To ensure a satisfactory playing environment is provided it is important that division nets are positioned to ensure adequate run-offs are provided.

11 a-side hockey ¹		Length	Width
Field of play		91.40 m	55.00 m
End run-offs		3.00 m	
Side run-offs			2.00 m
Hockey5s ¹ ,			
Field of play ²	Minimum	≈ 40.00 m	≈ 28.00 m
	Recommended	48.00 m	31.76 m
Run-offs ³		3.0 m	2.0 m
Tennis ⁴			
Principal playing area		23.77 m	10.97 m
End run-offs		5.49 m	
Side run-offs			3.05 m
Run-offs between courts			3.66 m

Principal playing area	30.50m	15.25m
End run-offs	Min. 2.0m Rec. 3.05m	
Side run-offs		Min: 1.50m Rec. 3.05m
Run-offs between courts		2.00m

- 1 as specified by the International Hockey Federation
- 2 The key principle to designing a Hockey5s court is flexibility. The game can be played on any suitably sized area. Courts used for top level tournaments measure 48 m by 31.76 m. Community Hockey5s can be played on smaller or larger courts. Ideally these will be rectangular and have a length to width ratio of approximately 1: 0.7. Smaller court sizes can be used if the number of players is reduced.
- 3 if Hockey5s rebound boards are fixed to the perimeter fencing of the court, there are no run-offs.
- 4 as specified by the International Tennis Federation
- 5 as specified by the International Netball Federation
- 6 some national netball associations allow reduced run-offs for community level netball

“When designing a Gen 2 facility, consideration should be given to:

- *the priority sports / activities*
- *the levels of play*
- *the frequency of use”*



Line markings

Accommodating several sports on a Gen 2 pitch or court will result in multiple line markings. Experience shows that small ball sports (hockey and tennis) need the most vibrant line colours (white and yellow) whilst larger ball sports, such as netball and futsal, can work with less vibrant colours such as contrasting greens, blues, oranges, reds etc.

If the main playing surface is green, consideration should be given to red lines being difficult to see by people suffering from colour blindness.

Lines can either be manufactured from synthetic turf or be painted onto the surface. To minimise the ongoing maintenance costs and the risks of repeated applications of paint forming a hard, abrasive crust on the playing surface, it is recommended that synthetic turf lines are used wherever possible. Ideally painted lines should only be used as a short term temporary solution.

Most sports have high-use areas, (goal mouths, tennis court base lines, netball shooting circles, etc.). Setting out the court and hockey markings so these areas do not overlap each other will help reduce premature wear.

*“Wherever possible use common lines –
players will quickly adapt and learn which
lines to play to.”*



Sports equipment

The sports being played on a Gen 2 area require specialist equipment (goals, nets and posts, etc.). These should comply with relevant standards such as EN 750 (hockey goals), EN 1510 (tennis nets and posts), etc.

The equipment needs to be safely stored outside of the playing areas (including run-offs) when not in use. Experience has shown this is most practically achieved by having a secure storage compound adjacent to the facility. This should include some form of vermin proof cabinet for the storage of tennis nets, etc.

On areas where cross-pitch hockey training will take place, either folding goals or off-field storage recesses should be provided to allow the hockey goals to be moved out of the way when other sports activities are taking place.

A pitch is often divided using heavy-duty 3m high division netting with a weighted bottom line, hung from a tensioned cable and supported with intermediate support posts. The tensioned cable is normally suspended from pitch divider posts located alongside the perimeter fencing. The foundations for these posts can often be a concrete block that is 1m³ or more in size, meaning it is important that its position in relationship to perimeter drains and floodlight power cables, etc. is carefully planned.

If hockey is being played on part of a pitch when other activities are taking place elsewhere, it is recommended portable pitch division pads are placed along the bottom of the division netting to ensure hockey balls do not pass under it.



*Portable Hockey5s
rebound boards*



*Portable tennis posts &
net rebound boards*



Free standing netball



Division nets

Construction standards

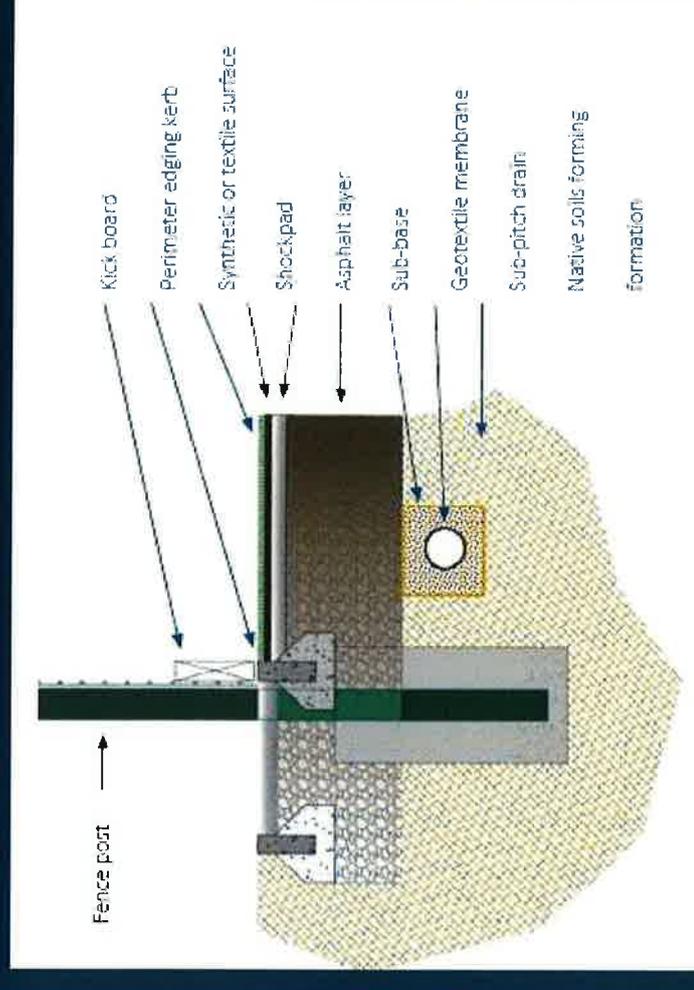
There are many ways of constructing a synthetic turf sports area. In many parts of the world this will comprise a foundation or sub-base made from carefully selected crushed rock which is topped with an asphalt layer. This is designed to provide a smooth load-bearing platform on which the shockpad and synthetic turf is laid. The asphalt layer and sub-base may be permeable or impermeable depending on the type of drainage being used.

The pitch or courts should be constructed to the construction tolerances specified in the *FIH Hockey Turf & Field Standards*, which have similar criteria to those specified for tennis and netball.

Due to the many localised considerations that will have a significant bearing on the design and construction of the foundations and drainage system required, it is not possible to set general design standards for them. In some countries, national guidance and standards are available and these should be followed whenever possible.

Where no such guidance is available, it is essential a specialist design team and construction company be appointed to undertake the works. Identifying such companies can be difficult, which is why the FIH has introduced the certification of **FIH Preferred Suppliers** and **Certified Field Builders**. These are companies with a proven ability to design and construct sports facilities. Visit www.fih.ch/hockeyturf for further details.

In many parts of the world, the construction of a hockey pitch or court will typically comprises:



Sports Lighting

It is important that the lighting is of an appropriate quality:

- to ensure the various sports can be played under acceptable lighting conditions and to safeguard the safety of players and others involved in the game
- to ensure the effective use of money spent on capital and operating costs, over time
- to minimise the impact of light pollution on the surrounding environment.

It is recommended a Gen 2 facility is lit to satisfy the Class II requirements of the *FIH Guide to Sports Lighting* (non-televised) 2017 edition.

“It makes great sense, and many funders will insist, on floodlighting a multi-sports facility to ensure maximum use and return on investment”

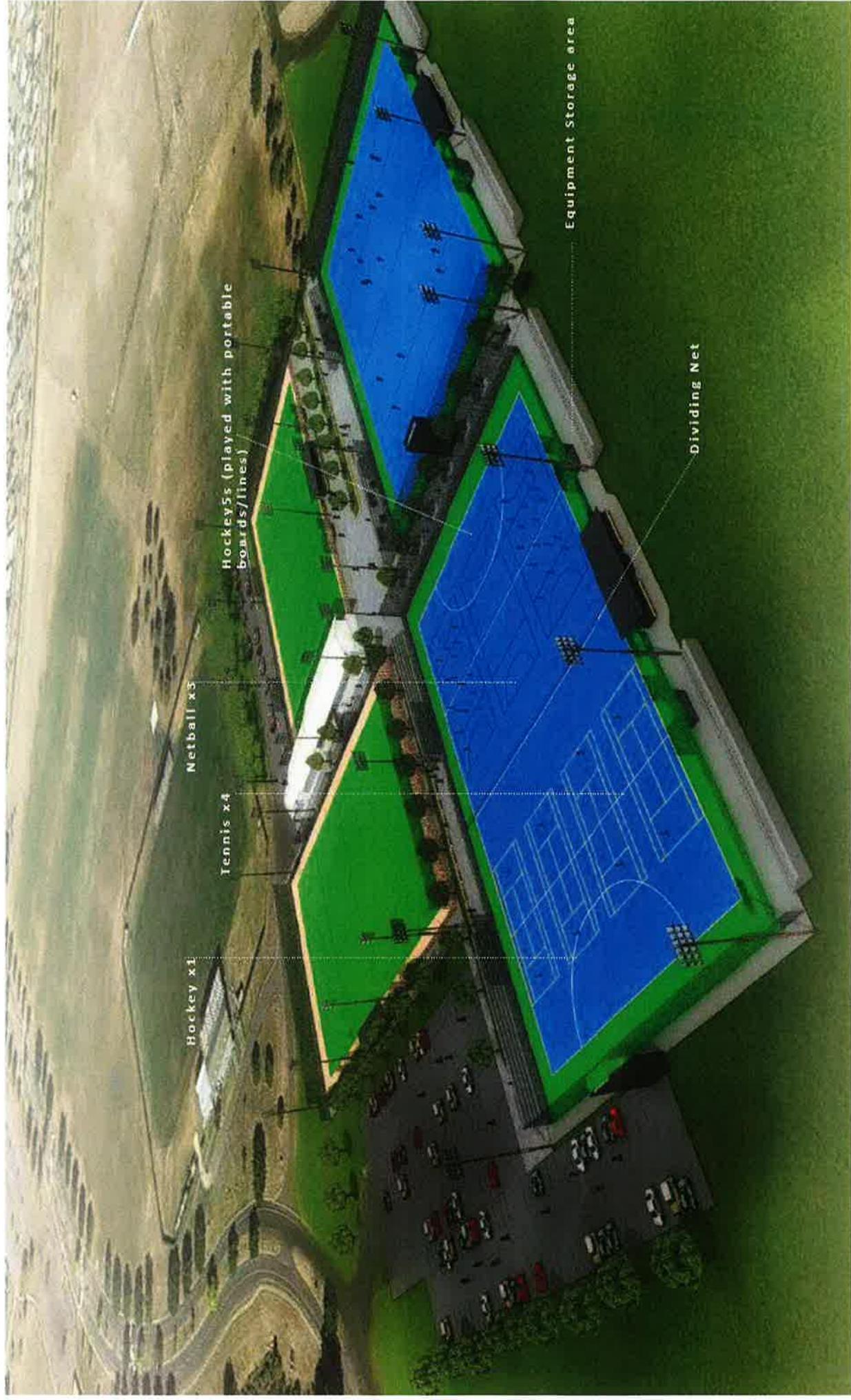
Eh Lux avg.	(U ²) min/avg.	(U ¹) min/max	UG	GR Max	CRI	Kelvin
350	0.70	0.50	0.65	<50	>65	>4000

Note – the FIH Class II lighting requirements are slightly lower than minimum guidelines for tennis. If league tennis is envisaged for the facility the guidance of the national tennis association should be sought before designing the lighting system.

Full size fields will normally be lit using a number of floodlight columns along each side. If it is intended to divide the field into two halves, three columns per side are adequate. If the field is to be divided into thirds, four columns per side gives greater flexibility.



Gen 2 design options: hockey, tennis, netball & Hockey5s



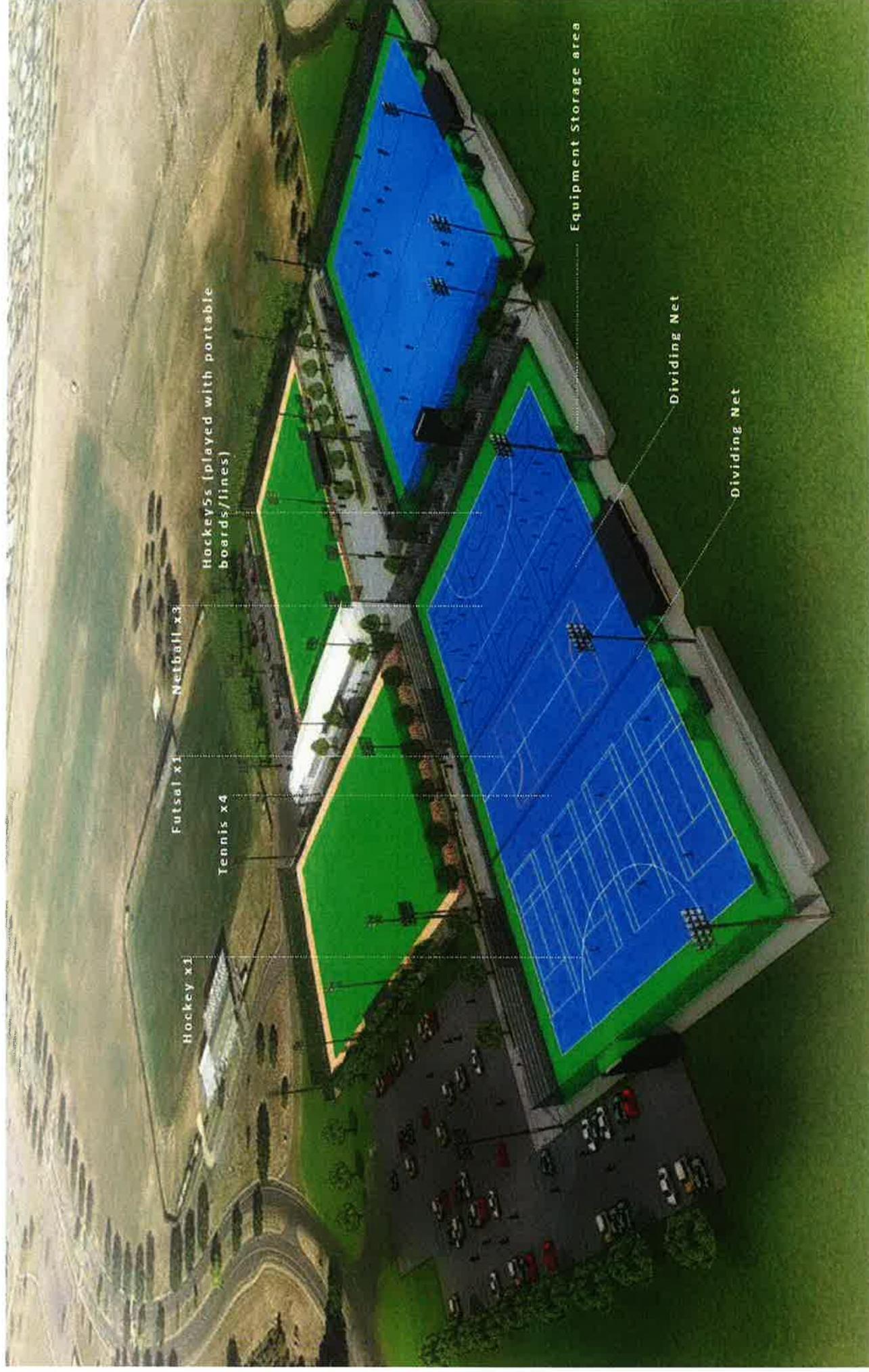
Gen 2 design options: hockey, tennis & Hockey5s



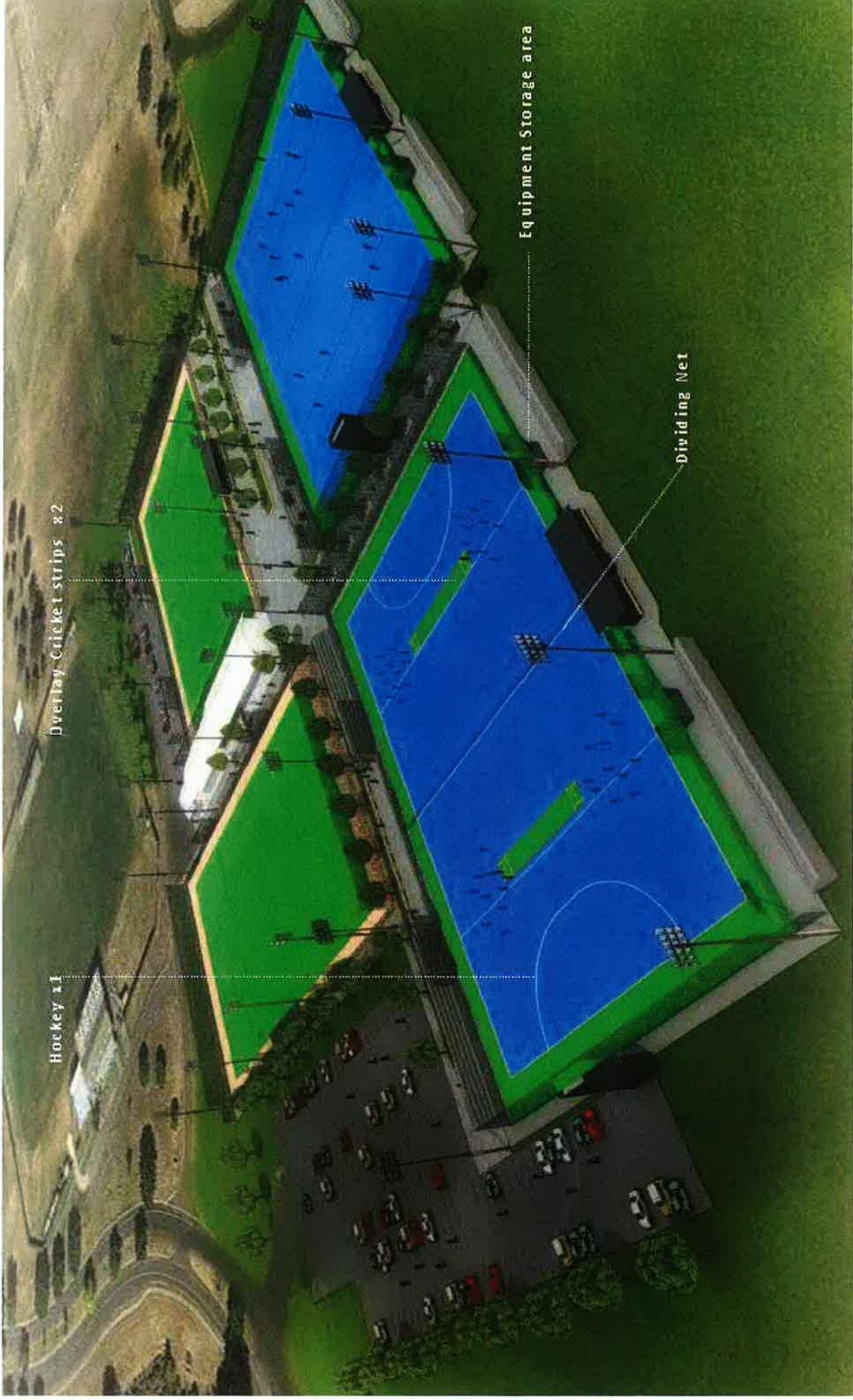
Gen 2 design options: hockey, netball & Hockey5s



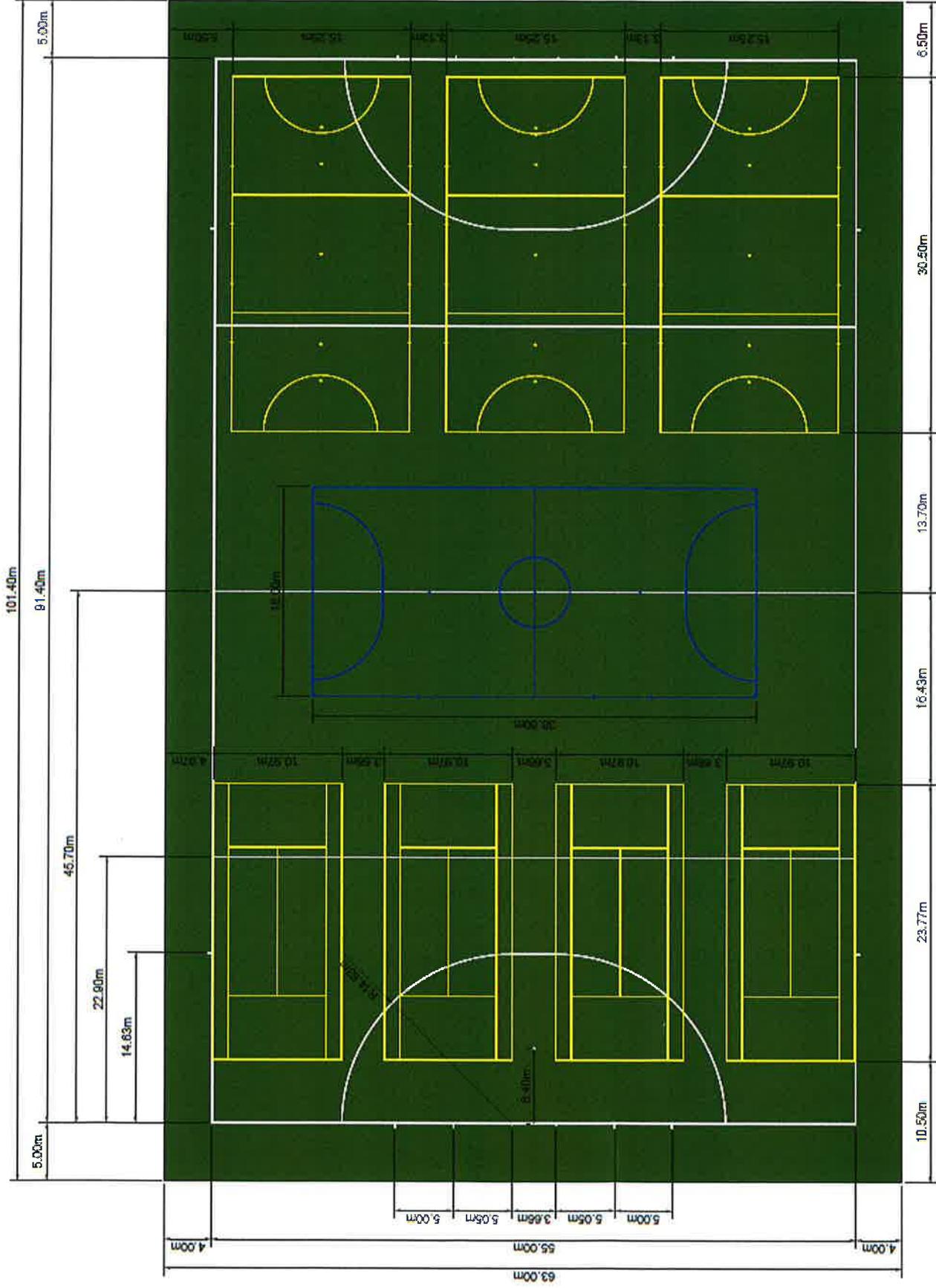
Gen 2 design options: hockey, tennis, netball, Hockey5s & futsal



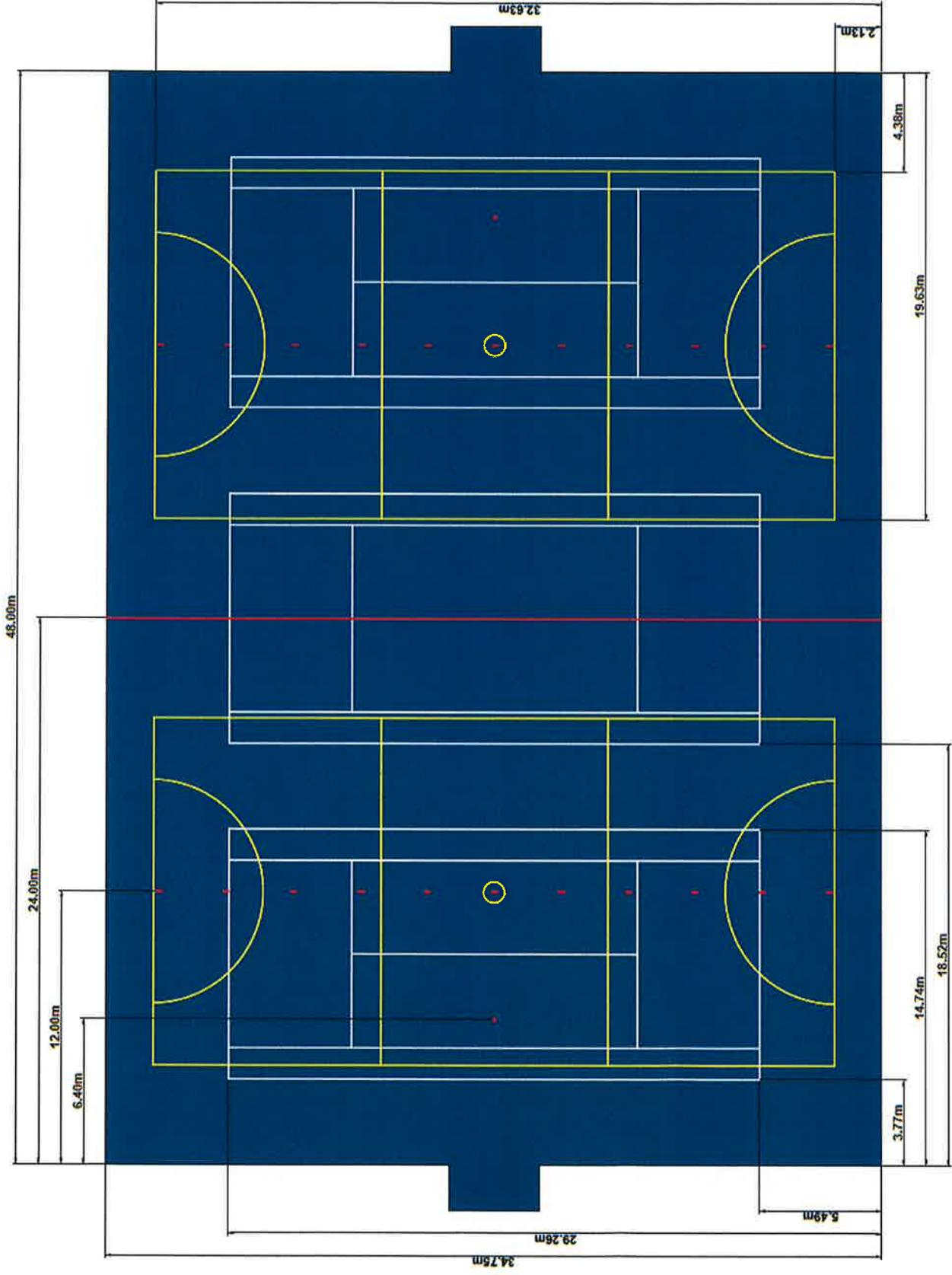
Gen 2 design options: hockey & cricket (with roll-out mats)



Gen 2 layout options: hockey, tennis, netball, futsal & Hockey5s



Gen 2 layout options: Hockey5s, tennis and netball



References:

- FIH Hockey Turf & Field Standards – www.fih.ch/hockeyturf
- EN – European Standard published by the European Standards Committee (CEN)
- ITF Court Pace Rating – www.iffennis.com/technical/courts/court-testing/overview
- Code of Practice for the Design, Specification and Testing of Bases for Outdoor Synthetic Sport Areas – www.sapca.org.uk
- FIH Guide to Sports Lighting – www.fih.ch/facilities

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- S & C Slatter Ltd – www.sandcslatter.com
- Studio 106 – www.106architects.com
- TigerTurf – www.tigerturf.com

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INTERNATIONAL HOCKEY FEDERATION



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multi-sports areas

maximising sporting opportunities

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Hockey is the world's third most popular team sport. Fast, technically skilful, and requiring good levels of personal fitness, the sport is renowned for its social inclusiveness, gender equality, and ability to attract and engage with players for many years.

With an innovative approach to improving the game, hockey recognises the benefits synthetic turf surfaces offer, and embraces their use at all levels of the game.

Creating opportunities for people to discover and play hockey is often difficult. For some, the challenge is providing suitable areas to play, for others, ensuring facilities are sustainable is key to their long-term success.

Many sports face these challenges, and this is making the concept of multi-sports fields increasingly attractive; sharing facilities and maximising opportunities is often the best way to secure investment.

Unfortunately, there is not a single type of turf that meets the needs of every sport. Soccer ball, contact or non-contact sport, high grip and grip; all these factors affect how players roll. Finding the right compromise is key to success.

The GEN 2 concept shows how surfaces designed for hockey, can also be used by other sports.



Community and school hockey is best played on 2G synthetic turf. Unlike longer pile turfs, the short dense pile of a 2G surface allows a hockey ball to travel quickly and predictably across the surface; just what the players want.

By laying the correct shockpad under the 2G synthetic turf, you can also provide a great playing surface for community level:

- Futsal
- Soccer
- Tennis
- Netball
- Lacrosse
- Softball
- Athletics training / jogging tracks



Outdoors, there are two versions of hockey

Hockey – played by two teams, each with 11 players on a full-size field

Hockey5s – played by two teams, each with 5 players on a court. These are either set-up temporarily on a full size field, or are standalone facilities.

Both types of hockey facility can be used by other sports. The FIH GEN 2 concept shows you how.



2G synthetic turf surfaces

- Short dense pile turf laid over a absorbing pad
- FIH Approved
- Suitable for use dry or wet – no
- Environmentally friendly
- Easy and cheap to maintain
- Extremely durable
- Over 20 year's proven real world

Hockey, soccer and futsal

The fast pace of 2G synthetic turfs means they are great for hockey and futsal, and suitable for community soccer and football training.

Dual use hockey/soccer fields are common in many countries, especially in schools and colleges.

Smaller, more affordable, courts are perfect for Hockey5s and futsal. One full size field or eight sports-courts, you decide which makes most sense!



Hockey and tennis

By laying a stiff shockpad beneath a 2G synthetic turf, a hockey facility can also be a community tennis centre.

Up to 12 tennis courts can be marked onto a full size hockey field. All you need are portable tennis posts and nets, and, ideally, division nets to separate the rows of courts.

A three court tennis block is also large enough for one Hockey5s court.



GEN 2
CONCEPT

Endorsed by



Hockey and netball

2G synthetic turfs provide an acceptable playing surface for community and club level netball.

Up to 9 netball courts can be incorporated onto a full size hockey field. All you need are portable netball goal posts.

A block of three netball courts is also large enough for one Hockey5s court (and three tennis courts).



GEN 2
CONCEPT

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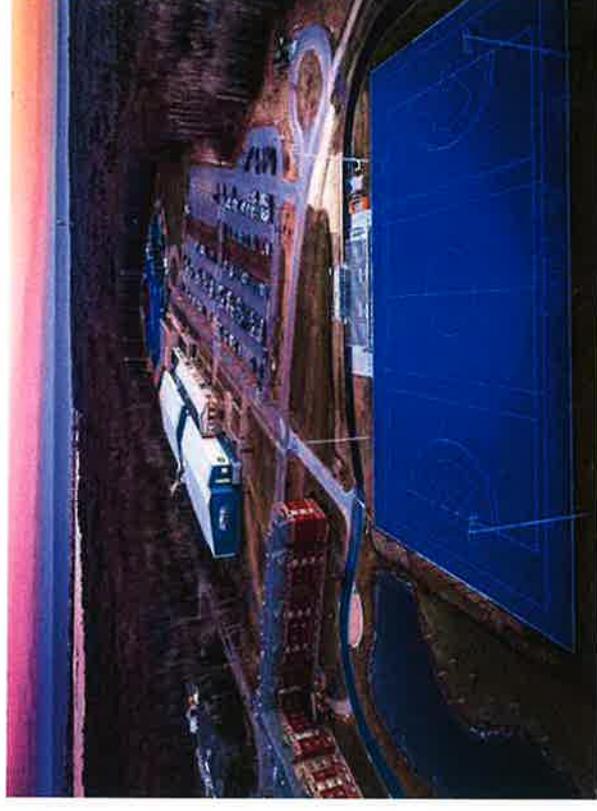


Hockey and lacrosse

Hockey and lacrosse have much in common; both are fast moving, action packed sports played, with a small ball and stick.

Not surprisingly, both sports have similar needs; players want safe, fast surfaces that allow swift and secure movement and play.

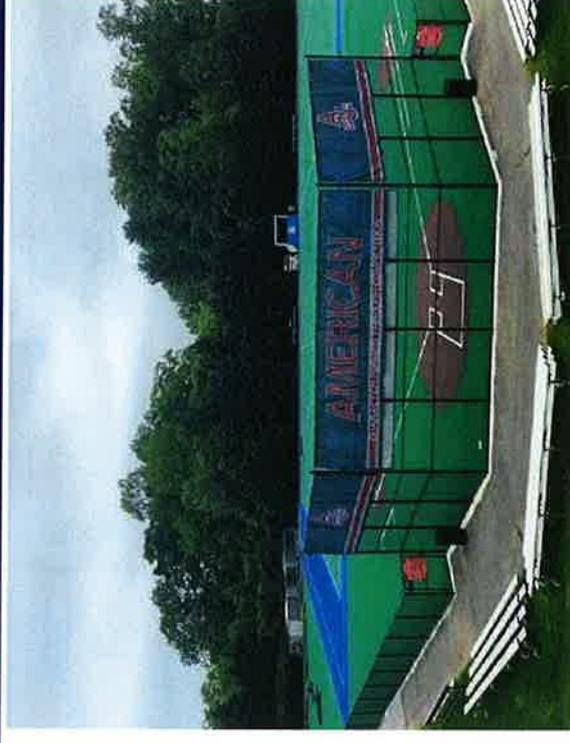
2G synthetic turfs allow both sports to be played successfully on the same field.



Hockey and softball

Base-running sports like softball are increasingly converting to synthetic turf fields due to the benefits they offer in regions that experience inclement weather, or where high levels of use or inadequate maintenance resources, make natural surfaces unsustainable.

Utilising innovative layout designs, softball can be incorporated into multi-sports fields, maximising opportunities, justifying investment.



Hockey and athletics

2G synthetic turf surfaces provide levels of athletic performance that fall within the ranges specified by World Athletics for polymeric tracks.

Whilst not suggesting 2G synthetic turf are suitable for high level athletics, the surfaces do allow school competitions and community jogging activities to take place.



FIH Quality Programme

With over 30 years experience, the FIH Quality Programme provides consistent and dependable industry standards that ensures the appropriate facility for the intended level of play.

It protects those investing in facilities by ensuring that only high quality synthetic turf products are installed, and that the field or court has been designed and built to the necessary standards.

- Industry leading design and construction standards
- Over 300 FIH Approved Hockey Turf Products
- FIH Preferred Suppliers, Certified Manufacturers & Certified Field Builders

