

# Appendix B

## Project Specification

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## 1 Introduction

These Employer's Requirements define the performance, sports federation certification, materials quality, construction quality and warranty requirements for synthetic turf sports pitches procured through the Football Foundation AGP Framework 2020. They shall be read in conjunction with the Contract Preliminaries, Project Briefs and all other associated specification and contract documentation issued for the projects.

## 2 Definitions & terminology

The following definitions shall apply:

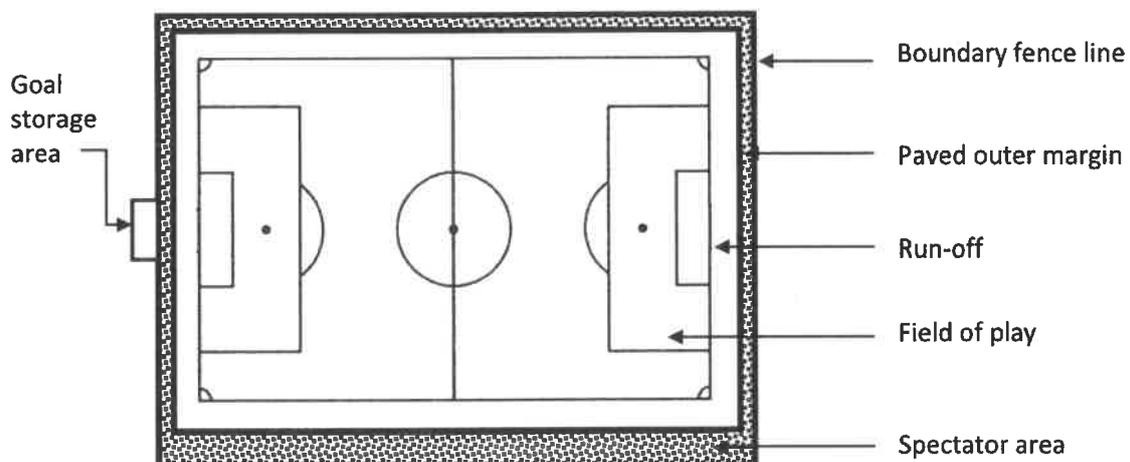
**Framework Supplier (FS)** – the company appointed through the Football Foundation's AGP Framework 2020 to design and construct the synthetic turf pitch.

**Framework Managing Consultant (FMC)** – the company appointed by the Football Foundation to provide contract administration and Employer's Agent services to projects procured via the Football Foundation's AGP Framework 2020.

**Specialist Testing Consultant (STC)** - the company appointed by the Football Foundation to provide specialist key stage inspection and testing services to projects procured via the Football Foundation's AGP Framework 2020.

**Concept Design Document (CDD)** – a site/project specific document that defines the precise requirements for each project being procured via the Football Foundation's AGP Framework 2020.

The following terminology is used within these Employer's Requirements:



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### 3 Design responsibilities

The Framework Supplier shall assume full responsibility for the preparation of the design, and for the construction of the whole of the project as described in the Project Brief. Any preliminary or preferred scheme indicated in the Concept Design document Brief or the Employer's Requirements represents a discharged portion of the design service previously commissioned by the Framework Managing Consultant. The Framework Supplier shall use any such scheme as a basis for the development of the undischarged portion of the pitch's design.

The Framework Supplier shall conform to the mandatory data and any dimensions indicated in the tender documents. Any materials, fixings, foundations or drainage detail indicated in these documents are typical only and shall not relieve the Contractor in any way of any of his design or other responsibilities.

### 4 Quality of materials and workmanship

Where and to the extent that materials, products and workmanship are not fully specified they are to be:

1. suitable for the purposes of the Works stated in or reasonably to be inferred from the contract documents.
2. in accordance with good sports field building and/or engineering practice, including the relevant provisions of current British Standards.

### 5 Site Access and Limitations of Working Space

The Framework Supplier shall allow for forming a suitable site access to allow the works to be undertaken during the agreed contract period. This shall include providing all temporary roads, hard standings, crossings and the like necessary for carrying out the whole of the Works. On completion of the works the contractor shall remove any temporary haul roads and fully reinstatement access way.

The Framework Supplier shall confine everything pertaining to the Contract within the area of the proposed works and surrounding areas. The Framework Supplier operations are to be confined to the minimum area required to carry out the works, which shall be executed carefully so as to cause minimum nuisance and inconvenience to the users of adjoining facilities.

### 6 Key stage inspections

Where the Framework Supplier has given notice that a particular operation or stage of the works will be ready for inspection by the Specialist Testing Consultant on a specified date and the STC then find that the works are not complete on that date so that the inspection cannot be carried out or completed necessitating a further visit, the additional cost incurred, including all expenses, will be borne by the Framework Supplier.

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The Framework Supplier shall also be liable for all costs, including expenses, incurred as a result of their consultants having to make additional visits to recheck areas of the works identified as not been in accordance with the Employer's Requirements and or Concept Design Document.

## 7 Failure of tests

Should any samples or intermediate stages of construction tested be found, in the opinion of the STC, to be unsatisfactory or likely to produce unsound work, the defective material or the consignment which the sample represents shall be removed from the site or suitable corrective action taken. Notwithstanding that, any sample or intermediate work stage, which has been accepted by the FMC or STC, may subsequently be rejected if they decide that the quality has in any way deteriorated.

The Framework Supplier shall, at their own expense, remove and replace all rejected materials, or correct any intermediate work stage shown to be outside specification. Any delays consequential upon the rejection of any sample or work stage shall not in any way relieve the Framework Supplier from his responsibility with regard to completion within the Contract Period.

Work corrected or materials replaced for these reasons will be re-checked by the STC or re-tested as determined by the FMC. The additional costs of testing any material replaced for this reason or re-inspecting any work stage subjected to remedial works shall be recovered from the Framework Supplier.

## 8 Time lapse and drone video recording of the construction period

During construction time lapse videos of the works shall be recorded. One completion of the works a drone video of the site shall be taken (day and night shots with sports lighting in operation).

There shall no branding on either the time lapse or drone videos.

Copies of the time lapse and drone videos, in MP4 or MOV format, shall be transferred to the FMC, Football Foundation and field owner at the time of handover, using *We Transfer* or *Drop Box* file transfer.

When transferring the videos to the FMC, Football Foundation and field owner the Framework Supplier shall be deemed to be granting them to use the content for publicity and commercial activities.

The videos shall meet the following requirements:

### Time lapse during construction

**Minimum resolution** Minimum HD 1080p 1920 x 1080, preferably 4K.  
CCTV cameras shall not be used.

**Frequency of imaging** One image every 3 minutes throughout each working day.

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**Power requirements**                      Either a small solar panel or permanent power put in place by the Framework Supplier

**Mounting requirements**                The Framework Supplier shall provide their own mounting position e.g. a 6m root mounting lighting column to put the camera on

**Remote monitoring**                    The Framework Supplier shall monitor the camera and ensure it is working.

**Drone imaging of completed field**

**Minimum resolution**                    Minimum 1080p 25fps, preferably 4K.

**Supplier requirements**                The operator of the drone shall be CAA licenced and have specific drone insurance with a valid permit for commercial operations

**Expected output**                        One 15-minute flight to give a variety of shots

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## 1 Introduction

A pitch comprises the field of play and perimeter run-off margins. Unless otherwise specified these shall be in accordance with this document.

In addition to the field of play and perimeter run-offs, paved perimeter margins, spectator areas and goal storage areas are normally incorporated into the footprint of the pitch. These shall be as specified in this document and the Concept Design Document.

## 2 Dimensions

### 2.1 Football

Unless otherwise specified, the layout, and dimensions of all pitches shall be in accordance with the *FA Guide to 3G Football Turf Pitch Design Principles and Layouts*<sup>1</sup>,

User group	Field of play	End run-offs	Side run-offs	Total synthetic turf area
U17 & U18 Over 18 - 11 v 11	100m x 64m	2 x 3m	2 x 3m	106m x 70m
U11 and U12 9 v 9	73m x 46m	2 x 3m	2 x 3	79m x 52m
U9 and U10 - 7 v 7	55m x 37m	2 x 3m	2 x 3m	61m x 43m

In addition to the synthetic turf area, pitches shall include:

- Goal storage areas, as required and detailed in the *FA Guide to 3G Football Turf Pitch Design Principles and Layout*, 2019 edition and or detailed in the Concept Design Document;
- Spectator areas as required and detailed in the *FA Guide to 3G Football Turf Pitch Design Principles and Layout*, 2019 edition and or the Concept Design Document;
- 0.3m wide (min) paved margins around the outside of the pitch wherever there is no paved spectator area or 500mm high (minimum) solid fence panel adjacent to the synthetic turf.

### 2.2 15 a-side Rugby Union

Field of play	Dead ball zone	End run-offs	Side run-offs	Total synthetic turf area
100m x 70m	2 x 5m	2 x 5m	2 x 5m	120m x 80m

<sup>1</sup> [www.thefa.com](http://www.thefa.com)

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In addition to the synthetic turf area pitches shall include:

- Spectator areas as specified by the RFU and or the Concept Design Document;
- 0.3m wide (min) paved margins around the outside of the pitch wherever there is no paved spectator area or 500mm high (minimum) solid fence panel adjacent to the synthetic turf;
- Goal storage areas on dual use rugby / football pitches, as shown on the layout drawing in the Concept Design Document

### 2.3 11-a-side hockey

	Field of play	End run-offs	Side run-offs	Total synthetic turf area
FIH minimum	91.4m x 55.0m	2 x 3m	2 x 2m	97.4m x 59.0m
FIH recommended	91.4m x 55.0m	2 x 5m	2 x 3m	101.4m x 61.0m

FIH specify run-offs and minimum run-offs as detailed above. Some higher-level competition rules require pitches to have the recommend run-offs. Run-offs shall be in accordance with England Hockey competition regulations and or the Concept Design Document.

FIH specify the outer 1m portion of the run-off may be a hard-paved surface.

Hockey goal storage areas shall be a minimum 1.5m in depth.

### 3 Orientation

Unless specified in Concept Design Document, the main playing direction of a pitch shall be approximately north (between 285° and 20°) / south.

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## Foreword

This section of the Employer's Requirements specifies the design, construction and performance requirements for the formation, drainage and base of any synthetic turf pitch procured via the AGP Framework 2020. They are based on the draft *Code of Practice for the Design, Specification and Testing of Bases for Outdoor Synthetic Sport Areas*<sup>1</sup>.

## 1 Definitions

The following definitions apply:

**Base** – all elements of construction beneath the synthetic turf surfacing.

**BS** – British Standard published by the British Standards Institute<sup>2</sup>. These include BS EN (British editions of European Standards) and BS ISO (British editions of International Standard Organisations) Standards.

**Designer** – the person or persons that develop and specify the design of the pitch.

**Design Levels** – the theoretical levels for the finished playing surface and/or underlying stages of construction as specified by the designer when developing the design concept for the facility.

**MCDHW** - Manual of Contract Documents for Highway Works<sup>3</sup> published by the (UK) Department for Transport.

In accordance with common practice within the construction industry the depth of any individual construction layer specified is defined as the nominal compacted depth, which can be regarded as the design depth of the construction layer.

## 2 Basic Design Principles

The base works for the pitch will normally comprise the following layers from the bottom up:

- The natural soil (cut and/or fill), termed the formation (also known as the sub-grade)
- A drainage system designed to remove water that falls onto the playing surface or flows towards it from surrounding ground.
- A layer(s) of unbound aggregate termed the sub-base

<sup>1</sup> Currently being developed by SAPCA in conjunction with Sport England

<sup>2</sup> <https://shop.bsigroup.com>

<sup>3</sup> <http://www.standardsforhighways.co.uk>

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- Either a layer of aggregates that can be graded to the tolerances required to receive the playing surface; termed the unbound base, or a layer or layers of bound asphalt, termed the bound (engineered) base, on which the playing surface is laid.

## 2.1 Design requirements

Based on specific site conditions the formation, sub-base, base and drainage system shall be designed to be able to:

1. Withstand all applied loads without excessive deformation or instability.
2. Restrict the likelihood of variable heave/settlement caused by frost penetration damage or volume changes in the formation soils.
3. Provide adequate drainage capability, and possibly storage potential, where appropriate, to ensure the design meets the need to remove surface water sufficiently quickly to avoid surface flooding during a prescribed storm return period.
4. To meet a design life of at least 25 years.
5. Have minimal impact on existing infrastructure such as services, drainage, etc.

Surface regularity is a key requirement of most sports' governing body specifications as it affects the playing quality and safety of athletes. This means the pitch surface shall remain stable throughout its service life, without significant changes in levels or differential settlement. The long-term stability of the base therefore requires the materials used to be durable and remain resistant to the applied mechanical and environmental loads (e.g. water, temperature variations, freezing, etc.) it will be subjected to.

The design and construction of the pitch shall be undertaken so it has minimal impact on any existing drainage (land or services) under or in the vicinity of the pitch.

## 2.2 Innovation and new construction methods

The criteria specified in this document are based on current best practice, but it is not the intention to restrict the innovation of new construction materials and methods. Such methods of construction are considered acceptable providing they achieve equivalent and/or appropriate performance in respect of:

- suitable stability and load-bearing capabilities
- adequate drainage values

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- surface levels
- longevity and/or warranties in line with the principles, criteria and ethos of this code of practice

Based on specific site conditions any innovative base or drainage system shall be designed to be able to meet the design principles detailed in Clause 2.1.

Some forms of synthetic turf pitch construction incorporate a thick ( $\geq 25\text{mm}$ ) elastic layer or shockpad that, in addition to contributing to the dynamic performance of the playing surface, also acts as a form of bound base layer above the sub-base. In such cases the sub-base shall be constructed as detailed in these Employer's Requirements.

### 3 Formation

#### 3.1 Design considerations

The formation is the material on which the pitch is constructed, and it needs to have adequate stability and load-bearing capacity to support the construction being placed on it. Its ability to achieve this will depend on a number of different factors including the various weather conditions that will occur during the seasons and the types of soils present on the site. Factors that need to be considered and minimised include the potential for:

- Frost heave
- Clay shrinkage/swelling
- Settlement (under the additional weight of the facility above)
- Vegetation disturbance (e.g. tree roots/weed growth)

#### 3.2 Load-bearing capacity

When tested using a Dynamic Cone Penetrometer (DCP) to a depth of 0.5m below formation, in accordance with *Design Manual for Roads and Bridges HD29/08 Volume 7<sup>4</sup> Section 3 clause 7.27* the inferred CBR value shall be  $\geq 5\%$ .

In the case of innovative and/or alternative base designs, the designer should justify any variation in the minimum requirements of formation performance.

It is recognised that due to the diversity of soils that can form a formation and their sensitivity to moisture, the requirements detailed above cannot always be achieved. In such cases one of the following ground preparation methods shall be used:

<sup>4</sup> <http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol7/section3/hd2908.pdf>

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- Installation of suitable selected additional material to improve the formation strength and stiffness;
- Stabilisation (e.g. treatment with lime and cement or similar suitable procedures);
- Installation of a geo-synthetic supporting material (e.g. geo-grids) or similar to provide reinforcement between the sub-base and formation.

In any of the above solutions, the Designer shall provide evidence of the design details that have been put in place to compensate for the shortcomings of the formation.

### 3.3 Geosynthetic separating layer

A geosynthetic separation layer should be laid over the formation to separate it from the overlying sub-base. The membrane (either non-woven or woven) should have a minimum tensile strength of 8kN/m when tested in accordance with BS EN ISO 10319 and a static puncture strength of at least 1.5kN when tested in accordance with BS EN ISO 12236. The membrane should be laid with joints that overlap by at least 300mm or to the manufacturer's recommendations.

### 3.4 Slope

The formation grade shall preferably have the same slope as the final playing surface, which shall be in accordance with the appropriate sport's governing body standard as follows:

Football: *FIFA Quality Programme for Football Turf, Handbook of Requirements*<sup>5</sup>

Rugby: *Rugby Turf Performance Specification*<sup>6</sup>

Hockey: *FIH Hockey Turf and Field Standards*<sup>7</sup>

To minimise the potential for polymeric infills to migrate to the edges of a long-pile synthetic turf pitch and into the surrounding neighbourhood, the slope shall be 0.5% unless site specific factors require a larger profile.

### 3.4 Deviations from design levels

Formation levels shall not deviate from the design levels by more than +20/-30mm.

<sup>5</sup> <https://football-technology.fifa.com/en/standards/>

<sup>6</sup> <https://playerwelfare.worldrugby.org/playingsurfaces>

<sup>7</sup> <http://www.fih.ch/inside-fih/fih-quality-programme-for-hockey-turf/facility-guidance-resources/>

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## 4 Drainage

### 4.1 Design considerations

The construction of the pitch shall incorporate a drainage system designed to remove rainfall from the playing surface at a rate to ensure that excess water is not allowed to build-up and restrict the use of the facility. The collected water should pass to the discharge outlet.

It may be a requirement to design the pitch's drainage capability to avoid the playing surface flooding to a specified level of risk, and/or to avoid excessive outlet discharge rates from the water that is collected (to restrict flooding risk downstream of the outfall). The permitted maximum drainage discharge rate may be stipulated as a condition of the planning approval for the facility and this may have a significant effect on the drainage design required (including the use of Sustainable Urban Drainage Systems - SUDS).

Due regard must be given to the size and location of any attenuation systems and soakaways and the calculations regarding their design shall be undertaken by a drainage expert. Due regard must be given to the fate of excessive surface water that is not collected in the water collection system and any associated risks to the local environs.

### 4.2 Performance and construction requirements

In the absence of any site-specific requirements the drainage system shall be designed and installed to:

- (i) Ensure that all surface water is removed from the playing surface at a rate greater than 180mm/h and ensure that no surface flooding will occur during heavy storms, or the facility will not be lost either through rain at the highest intensity which may be expected to occur once every ten years or through continuous rainfall of 200mm over a 24 hour period.
- (ii) Protect the installation from the effects of ground or surface water from the areas surrounding the pitch.
- (iii) Ensure no excessive water remains present in the construction that may result in a significant reduction of the load bearing capacity of the base or damage to the construction from the actions of frost.
- (iv) Prevent run-off from the pitch onto the surrounding land
- (v) Comply with all relevant requirements of BS EN 1610<sup>8</sup>

<sup>8</sup> BS EN 1610:2015 Construction and testing of drains and sewers

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The minimum depth of drain trenches shall be the diameter of the drain plus 150mm. The minimum width of the drain trench shall be at least three times the diameter of the drainage pipe which shall be centrally located in the trench.

Pipe bedding materials shall be clean, durable pea gravel or similar. Flexible pipes shall be laid on a bed of 75mm minimum depth and the drainage trench back filled with similar granular materials to a minimum depth of 150mm above the crown of the pipe.

Rodding eyes or catch-pits, with covers, shall be installed to allow inspection and maintenance of the main elements of the drainage system.

Pre-cast concrete manholes and any soak-away type structures shall comply with BS 5911-3<sup>9</sup>. Units that bed onto bases shall be manufactured so that the full wall thickness is in contact with the base.

Any existing land drains cut through during the construction of the new facility shall be re-connected into the new drainage system.

The spacing between lateral drains will be dependent drainage system's design but shall be no more than 10m for drains with an external diameter of 80mm or greater and no more than 7m for drains with an external diameter of less than 80mm. Lateral drains shall normally be laid to a minimum slope of 0.5%. Perimeter drainpipes with a minimum external diameter of at least 100 mm shall be laid when the drainage slope is at least 0.5%. For shallower slopes pipes with a diameter of at least 125 mm shall be laid. The minimum drainage slope shall be 0.3%.

#### 4.3 Surface water drainage

Surface water drainage (gully drains, slot drains, etc) shall be provided to all paved areas (spectator areas, perimeter margins, equipment storage compounds, etc.) adjacent to the pitch. The drainage system shall include trash boxes with suitably sized mud-buckets/filters to capture any infill and prevent it being washed into the drainage system.

### 5 **Perimeter edgings**

The base of the pitch shall be contained within hydraulically pressed concrete kerbs complying with BS EN 1339<sup>10</sup>. They shall be laid to a true line and level with adequate up-stand for the subsequent fitting of the synthetic turf surface. They shall be well haunched in concrete.

<sup>9</sup> BS 5911-3:2010+A1:2014 Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete manholes and soakaways (complementary to BS EN 1917:2002)

<sup>10</sup> BS EN 1339:2003 Concrete paving flags. Requirements and test methods

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## 6 Sub-Base

### 6.1 Design considerations

The sub-base shall:

- Provide adequate stability and load-bearing capacity in conjunction with the formation during both construction and in the long-term to support surface applied loads without excessive deformation or permanent damage. This shall include protection of the (weaker) formation soils beneath.
- Provide adequate stability to resist the effects of swelling, shrinkage or freezing in the formation soils.
- If the formation soils are frost susceptible, limit the likelihood of frost penetrating them.
- Provide adequate storage of infiltrating surface water when required as part of the design.

### 6.2 Sub-base depth

If the sub-base is being designed using a traditional construction method, based on the principles detailed in these Employer's Requirements, and having considered all specific site information, the sub-base shall have a design depth of at least 300mm. If ground conditions require, the depth of the sub-base shall be increased to satisfy the performance and construction requirements of these Employer's Requirements.

When alternative innovative forms of base design are being considered, the depth of the construction shall provide the levels of stability and longevity that are specified in this document.

At no point shall the installed depth be less than 90% of the design depth and the total area on which the depth is below the design depth shall not exceed 10% of the total surface area.

### 6.3 Sub-base materials

Unless an alternative innovative form of sub-base design is being used the sub-base shall be constructed from aggregates that comply with the requirements of BS EN 13285<sup>11</sup> and the MCDHW Series 800 (Clause 805).

<sup>11</sup> BS EN 13285:2018 Unbound mixtures. Specifications

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#### 6.4 Load Bearing Capacity

When tested using a Light Weight Deflectometer (LWD) in accordance with BS 1924 Clause 9.2<sup>12</sup> the surface modulus on the prepared sub-base shall be greater than or equal to 40 MPa. If this requirement is not achieved the Framework Contractor shall provide proposals on how they propose to improve the stability of the sub-base to ensure a satisfactory construction.

### 7 Base

#### 7.1 Introduction

The base layer used to regulate the sub-base on football and rugby pitches shall either be constructed with an unbound blinding layer or an asphalt (macadam) base.

Unless the design of a hockey pitch includes an elastic layer  $\geq 30$  mm in thickness, the base layer of a hockey pitch shall be asphalt.

#### 7.2 Unbound base blinding layer

##### 7.2.1 Aggregate grading

Unless otherwise specified by the Designer, an unbound base shall be constructed from aggregates that comply with all relevant clauses of BS EN 13285 and the particle grading given below.

Sieve size (mm)	% passing
16.0	100
14.0	90 -100
6.3	60 – 75
4.0	15 – 50
2.0	10 – 35
1.0	6 – 26
0.063	0 – 5

The unbound base layer shall be laid to a maximum depth of 50mm with no area being less than 20 mm thick.

#### 7.3 Asphalt (macadam) base

If the base of the pitch is to be asphalt/macadam it shall comply with the following requirements.

<sup>12</sup> BS 1942: 2018 Hydraulically bound and stabilized materials for civil engineering purposes. Part 2: Sample preparation and testing of materials during and after treatment

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The asphalt shall comply with BS EN 13108-7<sup>13</sup>. The bitumen used in the asphalt mix shall be Class 60-70 or Class 80-100; and be in accordance with BS EN 12591<sup>14</sup>.

The bitumen content shall be between 3.4 % and 4.0 % and be in accordance with BS EN 12591.

The asphalt shall be manufactured, transported and laid in accordance with BS 594987<sup>15</sup>.

If a single layer construction is used it shall be either 0/10mm or a 0/14mm grade asphalt, laid to an average consolidated thickness of 40 mm, with no area being less than 30 mm.

If a two-layer construction is used the binder layer shall be either a 0/10mm, 0/14mm or a 0/20mm grade asphalt, laid to an average consolidated thickness of 40 mm with no area being less than 30mm thick, and the surfacing layer shall be a 0/6 mm or 0/10mm grade asphalt, laid to an average consolidated thickness of 25 mm with no area being less than 20mm.

#### 7.4 Slope and deviation from design levels

The base shall have the same slope as the final playing surface, which shall be in accordance with the appropriate sport's governing body standard. Construction levels shall not deviate from Design Levels by more than  $\pm 15$ mm.

#### 7.5 Surface regularity

The surface regularity of the base shall be in accordance with the appropriate sport's governing body Standard.

#### 7.6 Water infiltration requirement

The base layer shall allow the percolation of water at a rate of more than 300 mm/h when tested in accordance with BS EN 12616<sup>16</sup>.

<sup>13</sup> BS EN 13108-7:2016 Bituminous mixtures. Material specifications. Porous Asphalt

<sup>14</sup> BS EN 12591:2009 Bitumen and bituminous binders. Specifications for paving grade bitumens

<sup>15</sup> BS 594987:2015+A1:2017 Asphalt for roads and other paved areas. Specification for transport, laying, compaction and product type testing protocols

<sup>16</sup> BS EN 12616:2013 Surfaces for sports areas. Determination of water infiltration rate

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## 8 Perimeter margins

If required (see ER 11), paved perimeter margins shall be designed to slope inwards from the fence line towards the pitch. Any surface water drain-outlets sited within the margin shall have suitable trash boxes and mud-buckets in accordance with clause 4.3.

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## 1 Introduction

The AGP Framework 2020 supports and endorses the handling of end of life synthetic turf pitches in accordance with the Waste Hierarchy<sup>1</sup>, which seeks to ensure waste is handled in the most sustainable way by ranking waste management options according to what is best for the environment.

Framework Contractors shall prioritise the disposal of end of life synthetic turf surfacing systems as follows:

1. Processing and conversion of materials to allow their reuse as new products/materials
2. Repositioning into the market for alternative uses
3. Energy recovery (incineration)

Disposal through landfill shall only be undertaken when specific written approval has been granted by the Framework Managing Consultant. Such permission will only be granted when the Framework Supplier is able to demonstrate that all other options, listed above, are not viable.

Processing, repositioning or disposal shall only be undertaken by a company and process that is approved by FMC.

## 2 Legal obligations<sup>2</sup>

The lifting and disposal of existing synthetic turf carpets, infill and shockpads shall be undertaken in accordance with the Waste (England and Wales) Regulations 2011, as amended.

In accordance with the regulations the Framework Contractor shall be defined as the *Producer* and shall undertake the following legal obligations:

- Take all such measures which are available, and reasonable, in the circumstances to apply the waste hierarchy.
- Correctly classify their waste according to the most appropriate six-digit code found in the European Waste Catalogue (EWC)<sup>3</sup>;
- Ensure that the waste is collected by a registered carrier and that any business the waste is taken to, has a correctly permitted site.

<sup>1</sup> As detailed in the European Commission's Waste Framework Directive (Directive 2008/98/EC)

<sup>2</sup> As detailed in the SAPCA guidance on the legal regulations governing the handling and disposal of synthetic turf sports surfaces

<sup>3</sup> The code for end of life synthetic turf currently being 20 01 99

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- Ensure that the operator of any site that accepts the waste either has an Environmental Permit or is registered with the Environmental Agency and has an appropriate<sup>4</sup> Waste Exemption Permit.
- If the waste is to be exported from the UK for processing, ensure that all legal obligations including the Trans-frontier Shipment of Waste Regulations (2007), are satisfied.

### 3 Processing of materials to allow their reuse

#### 3.1 Synthetic turf carpet

End of life synthetic turf carpet shall be lifted and taken to a plant licensed for the handling of waste synthetic turf surfacing to allow it to be processed and placed back into the market, as repositioned materials intended for alternative uses.

#### 3.2 Infill materials

Sand and rubber infill materials shall either be:

- Extracted from the carpet on site and, subject to testing to verify suitability, be processed to clean and regrade to allow reuse within the new synthetic turf playing surface;
- Taken to a licensed waste handling plant for processing to allow the materials to be placed back into the market, either as recycled infill material or repositioned for alternative uses.

#### 3.3 Shockpads

End of life shockpads shall be lifted and taken to a plant licensed for the handling of waste synthetic surfacing to allow it to be processed and placed back into the market, as repositioned material.

### 4 Reuse of existing shockpads

Wherever possible, existing shockpads should be retained and incorporated into the new synthetic turf surfacing system. To determine if an existing shockpad is suitable for reuse it shall be inspected by the Specialist Testing Consultant and tested in accordance with the procedures specified as follows:

Football: Clause 4.3 of the *FIFA Handbook of Requirements for Football Turf, October 2015 Edition*.

Rugby: Clause 8.5 of *World Rugby's Rugby Turf Performance Specification, 2016 Edition*

<sup>4</sup> Appropriate means that the permit or exemption states that the EWC of the Waste (20 01 99 for synthetic turf) can be accepted at the site and that the process that the Waste is to be subjected to, is permitted at the specific site.

AGP Framework 2020		<b>Football</b>  <b>Foundation</b>		
Employer's Requirements	04	RESURFACING OF EXISTING PITCHES	Version	1.1

Hockey: Clause 4.2.3 of Part 3 of the *FIH Hockey Turf and Field Standards*

In addition to satisfying the above requirements, samples of the shockpad shall be taken from the pitch and tested in the laboratory to determine if the shockpad's tensile strength is still compliant with the minimum tensile strength requirements of the relevant Standard listed above.

The thickness of the shockpad shall also be assessed on a 10m grid across the whole field to ensure a consistent depth ( $\pm 15\%$  of the mean) was previously installed.

AGP Framework 2020				
Employer's Requirements	04	FOOTBALL TURF	Version	1.1

## Foreword

This section of the Employer's Requirements specifies the performance and material requirements for the synthetic turf surfacing system laid on any synthetic turf football pitch procured via the AGP Framework 2020.

### 1 Intended usage

The pitch will be used for a range of football related activities including football, small-sided football (all forms), football training, general physical training and any other sports activities specified in the Concept Design Document.

It is envisaged that dual-use (school & community) pitches will be subjected to up to 80 hours use per week, and stadia and club pitches will be subjected to approximately 40 hours use per week; an indication of the predicted use being given in the Concept Design Document. The actual levels of use shall be monitored throughout the life of the field (see ER 12<sup>1</sup> for details).

The pitch shall provide a satisfactory playing environment for a minimum of eight years and its performance and compliance with the relevant competition and performance standards shall be as detailed in warranty requirements (see ER 13<sup>2</sup> for details).

Footwear will be controlled by the field operator, and the use of flat soled sports shoes, will be restricted as far as possible, but 100 percent use of studded boots cannot be assured.

Maintenance will be undertaken in accordance with the Framework Supplier's instructions using equipment supplied under the contract to build the pitch (see ER 12<sup>1</sup> for details).

### 2 Design and construction requirements

#### 2.1 Full size football pitches

Full size football pitches shall be designed and constructed to allow certification at handover and through the life of the playing surface in accordance with the performance warranty requirements of the *AGP Framework 2020*.

In summary these are:

<sup>1</sup> ER 12 – *AGP Framework [2019-23] Maintenance*

<sup>2</sup> ER 13 - *AGP Framework [2019-23] Performance and materials warranty*

AGP Framework 2020				
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FA Competition Steps	
1 and 2	FIFA Quality Pro for the full warranty period
3 – 6	FIFA Quality with annual re-testing, for the full warranty period
7 and below	<u>Initial certification</u> FIFA Quality  <u>Certification at Year 3</u> Fields not exceeding 4,500 playing hours (total) at the time of test: FIFA Quality  Fields exceeding 4,500 playing hours (total) at the time of test: FA Register  <u>Certification at Year 6</u> FA Register

## 2.2 Small-sided football pitches

Small-sided football pitches shall be designed and constructed to allow certification at handover and through the warranty period in accordance with BS EN 15330-1<sup>3</sup>.

## 3 **Synthetic turf surfacing quality standards**

The synthetic turf surfacing system shall be certified to the *FIFA Quality Pro* and *FIFA Quality* levels in accordance with the current laboratory testing requirements of the *FIFA Quality Programme for Football Turf*.

To minimise the potential for infill migration the surface shall, unless otherwise agreed with the Framework Managing Consultant, have a low splash rating when tested in accordance with FIFA TM 16<sup>4</sup>.

FIFA certification shall be based on the colours of the surfacing and line markings being offered for the project.

### 3.1 Synthetic turf carpet

The primary pile yarn shall be polyethylene mono-filament.

<sup>3</sup> BS EN 15330-1:2013 Surfaces for sports areas. Synthetic turf and needle-punched surfaces primarily designed for outdoor use. Specification for synthetic turf surfaces for football, hockey, rugby union training, tennis and multi-sports use

<sup>4</sup> FIFA TM 16 FIFA Quality Programme for Football Turf - Handbook of Test Methods

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The minimum tuft bind, when tested in accordance with BS ISO 4919<sup>5</sup>, shall be 45N.

The minimum tensile strength of the pile yarn, when tested in accordance with BSEN 13864<sup>6</sup> before and after UV ageing in accordance with BS EN 14836 (Method 2)<sup>7</sup> shall be 8N.

The minimum tensile strength of the carpet when tested in accordance with BS ISO 13934-1<sup>8</sup> shall be 15N/100mm.

The synthetic turf carpet shall satisfy the requirements of the REACH Regulations Annex XVII Entry 50 and the Heavy Metal Migration limits specified in BS EN 71-3<sup>9</sup> Table 2 Category III.

#### 4 Shockpad quality standards

If the Football Turf system includes a shockpad it shall comply with quality requirements of the *ESTO Performance Guide to Shockpads*.<sup>10</sup>

The combined design of any shockpad and the synthetic turf carpet shall ensure that slippage and creep of the carpet does not occur.

#### 5 Infill quality standards

##### 5.1 Performance Infill

Unless otherwise specified in the Concept Design Document, the Performance Infill shall be End of Life Tyre (ELT) granulate. The particle grading shall be in accordance with the FIFA Quality Programme (FQP) Product Test Report and in the range 0.5mm – 2.5mm. It shall be machine laid to the depth specified in the FQP Product Declaration.

The performance infill shall comply with the following requirements: <sup>11</sup>

<sup>5</sup> BS ISO 4919:2012 Carpets. Determination of tuft withdrawal force

<sup>6</sup> BS EN 13864 Surfaces for sports areas. Determination of tensile strength of synthetic yarns

<sup>7</sup> Surfaces for sports areas - Synthetic surfaces for outdoor sports areas - Test method for artificial weathering

<sup>8</sup> BS EN ISO 13934-1:2013 Textiles. Tensile properties of fabrics. Determination of maximum force and elongation at maximum force using the strip method

<sup>9</sup> BS EN 71-3:2019 Safety of toys. Migration of certain elements

<sup>10</sup> [www.estc.info](http://www.estc.info)

<sup>11</sup> Infills listed on the *SAPCA Quality Control Protocol for Sports Performance Infills* meet this requirement

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#### 5.1.1 Inhalable Dust Content

The Inhalable Dust Content of the infill shall be classified as Very Low or Low when measured in accordance with BS EN 15051<sup>12</sup>.

#### 5.1.2 Effective free metal and free fibre content

The effective free metal and free fibre content shall be zero.

#### 5.1.3 PAH content

PAH	Cas No.	Requirement	Test method
Benzo[a]pyrene (BaP)	50-32-8	≤ 20.0 mg/kg for the sum of the eight PAHs listed	PAH - AfPS 2014:01 PAK <sup>13</sup>  Prior to chemical analysis, samples shall be prepared in accordance with Appendix A of draft European Standard prEN 17409 <sup>14</sup>
Benzo[e]pyrene (BeP) C	192-97-2		
Benzo[a]anthracene (BaA)	56-55-3		
Chrysen (CHR)	218-01-9		
Benzo[b]fluoranthene (BbFA)	205-99-2		
Benzo[j]fluoranthene (BjFA)	205-82-3		
Benzo[k]fluoranthene (BkFA)	207-08-9		
Dibenzo[a,h]anthracene (DBAhA)	53-70-3		

**Sampling for routine product testing** – The infill manufacturer shall undertake routine sampling and testing in accordance with draft European Standard prEN 17409<sup>15</sup>.

#### 5.1.4 Heavy Metal migration

Element	Migration limit (mg/kg)	Element	Migration limit (mg/kg)
Aluminium	70,000	Manganese	15,000
Antimony	560	Mercury	94
Arsenic	47	Nickel	930
Barium	18,750	Selenium	460
Cadmium	17	Strontium	56,000
Chromium (III)	460	Tin	180,000
Chromium (VI)	0.2	Organic tin	12
Cobalt	130	Zinc	46,000
Copper	7,700	Lead	160

<sup>12</sup> BS EN 15051-1:2013 Workplace exposure. Measurement of the dustiness of bulk materials. Requirements and choice of test methods

<sup>13</sup> Published by the German Product Safety Commission

<sup>14</sup> prEN 17409: 2019 Code of Practice for the Sampling of Performance Infills used Within Synthetic Turf Surfaces.

<sup>15</sup> Suppliers listed on the SAPCA Quality Control Protocol for Sports Performance Infills satisfy this requirement

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**Test method** - As specified in Clauses 7 and 8 of BS EN 71-3

**Frequency of testing** - The manufacturer shall operate a quality assurance programme that allows for a minimum of one sample taken from production to be tested at least once every six months.

**Sampling for routine product testing** – The infill manufacturer shall undertake routine sampling and testing in accordance with draft European Standard prEN 17409.

#### 5.1.5 Performance Infill quality management system

The manufacturer of the infill shall be independently certified as operating a quality management system for the production of the infill in accordance with BS EN ISO 9001<sup>16</sup>. Testing of the performance infill shall be undertaken by a test laboratory accredited to BS EN ISO/IEC 17025<sup>17</sup> for the tests specified.

#### 5.1.6 Certificates of conformity

Certificates of Conformity confirming compliance with the requirements of clause 5.1 shall be included in the Operations and Maintenance Manual provided when the pitch is handed over.

#### 5.2 Stabilising infill

The stabilising infill shall be rounded sand in accordance with the FQP Product Declaration and in the particle range 0.2mm – 1.0mm.

The Inhalable Dust Content shall be classified as Very Low or Low (BS EN 15051).

## 6 **Installation standards**

### 6.1 Shockpad

If the synthetic turf surfacing system includes a shockpad it shall be designed and laid to ensure minimal remedial works are required when the synthetic turf carpet is removed and replaced in the future.

In situ-laid shockpads shall be machine laid using a suitable paving machine to form one homogenous layer across the whole of the field. Continuous monitoring of climatic conditions shall be undertaken during the laying of the shockpad to ensure that materials are not laid or left to cure in conditions outside the specified working conditions of the polyurethane binder being used. These conditions shall be notified to the FMC prior to works commencing.

<sup>16</sup> BS EN ISO 9001:2015 Quality management systems. Requirements

<sup>17</sup> BS EN ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories

AGP Framework 2020				
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Prefabricated shockpads shall either be inter-locking, ribbon bonded to the base or seamed along head joints in accordance with the manufacturer's instructions.

On completion of the shockpad installation the maximum undulation under a 3m straightedge, when tested in accordance with FIFA TM 12<sup>18</sup>, shall be 10mm.

#### 6.2 Synthetic turf carpet

The synthetic turf carpet shall be laid in full widths across the pitch, other than where longitudinal rolls are laid to include run-offs and tufted side-line markings.

The method of jointing / seaming, including all in-laid line markings, shall be such that no ridge, groove or creases occur. The maximum carpet seam gap shall be no greater than the tuft gauge of the carpet. No seam shall be within 300mm of any permanent inlaid line.

Bonded joints shall be formed using jointing tape of not less than 400mm wide and polyurethane glue applied evenly to either side of the tape to a minimum total width of 300mm. The strength of the bonded joints shall meet the requirements set out in *FIFA Quality Programme for Football Turf*.

There shall be no tuft loops, random long tufts, loose tufts, tears, holes or melted areas, undulations, pile height variations or any other visual or manufacturing defects.

If replacement of defective carpet is deemed necessary by the Employer or their agent, this shall involve full replacement of a length and width of a carpet roll (as designed and manufactured). No patching whatsoever will be allowed without written approval of the Employer.

#### 6.3 Line markings

The field shall be line marked in accordance with the Laws of the Game, as published by FIFA. Wherever possible lines shall be tufted into the carpet.

Football markings shall take priority over any other markings and be white in colour. Secondary markings, when required, shall be coloured as follows:

U11/U12 9v9: Blue  
 U9/U10 7v7: Yellow  
 U7/U8 5v5: Red

<sup>18</sup> FIFA Quality Programme for Football Turf - Handbook of Test Methods

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The layout of secondary markings shall be as shown in *The FA Guide to 3G Football Turf Pitch Design Principles and Layouts*<sup>19</sup>.

Main pitch marking shall be tufted / inlaid into the synthetic turf carpet.

Unless specified differently in the Concept Design Document, secondary markings shall be painted onto the synthetic turf carpet. As specified in the CDD, the paint shall either allow for:

- Semi-permanent marking
- Easy and full removal of temporary lines

Lines shall be a single width between 100mm and 120mm wide and, when measured with a steel tape, be within 20mm of their specified position.

No carpet seam shall be within 300mm of any permanent inlaid line.

Straight lines shall not deviate by more than 10mm from a line joining their ends, nor include any sudden steps. Line edges shall be parallel and uniform.

For a period of eight years following Practical Completion each straight-line marking shall remain straight to within  $\pm 20$ mm of a tensioned string line joining its ends and all lines shall remain within  $\pm 50$ mm of their original position as measured at Practical Completion. Furthermore, no line shall exhibit any sudden irregularity or deviation greater than 10mm over a distance of 1 metre.

#### 6.4 Stabilising infill

Stabilising infill shall be installed at the rate specified by the manufacturer of the synthetic turf surfacing system. It shall be installed in dry conditions and it shall be brushed into the carpet until an even thickness, at the specified application rate is achieved.

#### 6.5 Performance infill

The performance infill shall be installed at the rate recommended by the manufacturer of the synthetic turf, it shall be installed dry condition and it shall be brushed into the carpet until an even thickness of fill is achieved and the correct amount of carpet free pile above the level of the infill is present.

##### 6.5.1 Minimising environmental contamination

During the transportation, site storage and installation of the performance infill, steps shall be taken to minimising the risk of contamination of the environment by accidental spillage or poor working

<sup>19</sup> [www.thefa.com](http://www.thefa.com)

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practices resulting in infill materials contaminating the surrounding environment of the pitch and storm water drainage systems. These shall include, but not be limited to:

- Storing big-bags and palletised bags in areas that can contain any infill spillage, ensuring that it cannot be flushed into storm water drainage systems or adjacent water courses. Such areas to be cleaned on completion of the works to ensure any spilt infill is collected and disposed of in an environmentally friendly way;
- Opening bags and loading spreading machines within the synthetic turf area, whenever possible;
- Using purpose made spreading machines to apply the infill in a controlled manner that minimises the risk of infill being thrown outside the area;
- Removing any infill caught on installation (or maintenance) plant before it leaves the synthetic turf area.

#### 6.6 Field certification

Following completion of the pitch, and following any agreed period of establishment, the FMC/STC will arrange for it to be tested to determine if it satisfies the *FIFA Quality* category of performance, as defined in the *FIFA Quality Programme for Football Turf*. The Framework Supplier shall provide the following services during this process:

1. Making the on-line application to FIFA to allow a field test number and template report to be issued;
2. Ensure that all the required site samples of synthetic turf, shockpad and infill materials are available on the site, on the day of the field test, to allow the test institute to collect them;
3. Provide a copy of the FIFA test report and field certificate (assuming the field has passed) to the Employer's Agent within three working days of it being issued by FIFA.

## 7 **Dual sports pitches**

### 7.1 Football / Rugby Union

If the pitch is to also be used for Rugby Union, the following additional requirements shall apply:

#### 7.1.1 Additional design and construction requirements

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The pitch shall be designed and constructed to also allow certification at handover, in accordance with World Rugby requirements<sup>20</sup>.

#### 7.1.2 Additional synthetic turf surfacing system quality standards

The synthetic turf surfacing system shall be recognised by World Rugby as complying with the product requirements of their *Rugby Turf Performance Specification*.

#### 7.1.3 Additional line markings

Permanent rugby line markings shall be installed in accordance with the *Laws of the Game - Rugby Union*<sup>21</sup>, as published by World Rugby. The lines shall be yellow in colour.

#### 7.1.4 World Rugby field certification

Following completion of the pitch, and following any agreed period of establishment, the FMC/STC will arrange for it to be tested to determine if it also satisfies the field test requirements of World Rugby's *Rugby Turf Performance Specification*.

The Framework Supplier shall provide the following services during this process:

1. Making an on-line application to World Rugby to allow a field test number and template report to be issued;
2. Ensure that all the required samples of synthetic turf, shockpad and infill materials are available on the site, on the day of the field test, to allow the test institute to collect them;
3. Provide a copy of the World Rugby test report and field certificate (assuming the field has passed) to the Employer's Agent within three working days of it being issued by World Rugby.

#### 7.2 Football / Hockey

If the pitch is to also be used for hockey the following additional requirements shall apply:

##### 7.2.1 Additional design and construction requirements

<sup>20</sup> As defined in World Rugby's Rugby Turf Performance Specification

<sup>21</sup> <https://laws.worldrugby.org>

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The pitch shall be designed and constructed to enable certification in accordance with the FIH Multi-Sport Category 3<sup>22</sup> standard.

#### 7.2.2 Additional synthetic turf surfacing system quality standards

The synthetic turf surfacing system shall be an FIH Approved FIH Multi-Sport 3 product.

The minimum yarn thickness requirement detailed in Clause 2.1 is not mandatory for dual use football/hockey surfaces.

#### 7.2.3 Additional line markings

Permanent hockey line markings shall be installed in accordance with the *Rules of Hockey*, as published by the FIH. The lines shall be yellow in colour. The dashed 5m shooting circle markings are not required.

#### 7.2.4 FIH field certification

Following completion of the pitch and following any agreed period of establishment, the FMC/STC will arrange for it to be tested to determine if it satisfies the FIH Multi-sport 3 category of performance, as defined in Part 3 of the *FIH Hockey Turf and Field Standards*.

The Framework Supplier shall provide the following services during this process:

1. Ensure that all the required samples of synthetic turf, shockpad and infill materials are available on the site, on the day of the field test, to allow the test institute to collect them;
2. Provide a copy of the FIH test report and field certificate (assuming the field has passed) to the Employer's Agent within three working days of it being issued by FIH.

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<sup>22</sup> As defined in the *FIH Hockey Turf and Field Standards*

AGP Framework 2020				
Employer's Requirements	06	RUGBY TURF	Version	1.1

## Foreword

This section of the Employer's Requirements specifies the performance and material requirements for the synthetic turf surfacing system laid on any synthetic turf rugby pitch procured via the AGP Framework 2020.

### 1 Intended usage

The pitch will be used for a range of rugby related activities including rugby, tag-rugby, rugby training, general physical training and any other sports activities agreed in writing by the Framework Supplier and Employer.

It is envisaged that dual-use (school & community) pitches will be subjected to up to 80 hours use per week, and stadia and club pitches will be subjected to approximately 40 hours use per week; an indication of the predicted use being given in the Concept Design Document. The actual levels of use shall be monitored throughout the life of the field (see ER 12<sup>1</sup> for details).

The pitch shall provide a satisfactory playing environment for a minimum of eight years and its performance and compliance with the relevant competition and performance standards shall be as detailed in warranty requirements (see ER 13<sup>2</sup> for details).

Footwear will be controlled by the field operator, and the use of flat soled sports shoes, will be restricted as far as possible.

Maintenance will be undertaken in accordance with the Framework Supplier's instructions using equipment supplied under the contract to build the pitch (see ER 12<sup>1</sup> for details).

### 2 Design and construction requirements

Full and small-sided size rugby pitches shall be designed and constructed to allow certification at handover and through the life of the playing surface in accordance with World Rugby's Performance Specification and Regulation 22<sup>3</sup>.

<sup>1</sup> ER 12 - AGP Framework [2019-23] Maintenance

<sup>2</sup> ER 13 - AGP Framework [2019-23] Performance and materials warranty

<sup>3</sup> <https://www.world.rugby/handbook/regulations/reg-22/reg-22>

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Employer's Requirements	06	RUGBY TURF	Version	1.1

### 3 Synthetic turf surfacing quality standards

The synthetic turf surfacing system shall be recognised by World Rugby as complying with the product requirements of their *Rugby Turf Performance Specification*<sup>4</sup>.

To minimise the potential for infill migration the surface shall, unless otherwise agreed with the Employer, have a low splash rating when tested in accordance with FIFA TM 16<sup>5</sup>.

#### 3.1 Synthetic turf carpet

The primary pile yarn shall be polyethylene monofilament.

The synthetic turf carpet shall satisfy the requirements of the REACH Regulations Annex XVII Entry 50 and the Heavy Metal Migration limits specified in BS EN 71-3<sup>6</sup> Table 2 Category III.

### 4 Shockpad quality standards

Shockpads shall comply with the quality requirements of the *ESTO Performance Guide to Shockpads*.<sup>7</sup>

The combined design of any shockpad and the synthetic turf carpet shall ensure that slippage and creep of the carpet does not occur.

### 5 Infill quality standards

#### 5.1 Performance Infill

Unless otherwise specified, the Performance Infill shall be End of Life Tyre granulate. The particle grading shall be in accordance with the World Rugby Test Report Product Declaration and in the range 0.5mm – 2.5mm. It shall be machine laid to the depth specified in the Product Declaration.

The performance infill shall satisfy the following requirements:

<sup>4</sup> World Rugby *Rugby Turf Performance Specification*

<sup>5</sup> FIFA TM 16 FIFA Quality Programme for Football Turf - Handbook of Test Methods

<sup>6</sup> BS EN 71-3:2019 Safety of toys. Migration of certain elements

<sup>7</sup> [www.estc.info](http://www.estc.info)

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#### 5.1.1 Inhalable Dust Content

The Inhalable Dust Content of the infill shall be classified as Very Low or Low when measured in accordance with BS EN 15051<sup>8</sup>.

A minimum of one sample taken from production, shall to be tested at least once every three months.

#### 5.1.2 Effective free metal and free fibre content

The effective free metal and free fibre content shall be zero.

#### 5.1.3 PAH content

PAH	Cas No.	Requirement	Test method
Benzo[a]pyrene (BaP)	50-32-8	≤ 20.0 mg/kg for the sum of the eight PAHs listed	PAH - AfPS 2014:01 PAK <sup>9</sup>  Prior to chemical analysis, samples shall be prepared in accordance with Appendix A of draft European Standard prEN 17409 <sup>10</sup>
Benzo[e]pyrene (BeP) C	192-97-2		
Benzo[a]anthracene (BaA)	56-55-3		
Chrysen (CHR)	218-01-9		
Benzo[b]fluoranthene (BbFA)	205-99-2		
Benzo[j]fluoranthene (BjFA)	205-82-3		
Benzo[k]fluoranthene (BkFA)	207-08-9		
Dibenzo[a,h]anthracene (DBAhA)	53-70-3		

Sampling and routine product testing by the infill manufacturer shall be undertaken in accordance with draft European Standard prEN 17409<sup>11</sup>.

#### 5.1.4 Heavy Metal migration

Element	Migration limit (mg/kg)	Element	Migration limit (mg/kg)
Aluminium	70,000	Manganese	15,000
Antimony	560	Mercury	94
Arsenic	47	Nickel	930
Barium	18,750	Selenium	460
Cadmium	17	Strontium	56,000
Chromium (III)	460	Tin	180,000

<sup>8</sup> BS EN 15051-1:2013 Workplace exposure. Measurement of the dustiness of bulk materials. Requirements and choice of test methods

<sup>9</sup> Published by the German Product Safety Commission

<sup>10</sup> prEN 17409: 2019 Code of Practice for the Sampling of Performance Infills used Within Synthetic Turf Surfaces.

<sup>11</sup> Suppliers listed on the *SAPCA Quality Control Protocol for Sports Performance Infills* satisfy this requirement

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Chromium (VI)	0.2	Organic tin	12
Cobalt	130	Zinc	46,000
Copper	7,700		
Lead	160		

**Test method** - As specified in Clauses 7 and 8 of BS EN 71-3

**Sampling for routine product testing** – The infill manufacturer shall undertake routine sampling and testing in accordance with draft European Standard prEN 17409<sup>12</sup>.

**Frequency of testing** - The manufacturer shall operate a quality assurance programme that allows for a minimum of one sample taken from production to be tested at least once every six months.

#### 5.1.5 Performance infill quality management system

The manufacturer of the infill shall be independently certified as operating a quality management system for the production of the infill in accordance with BS EN ISO 9001<sup>12</sup>. Testing of the performance infill shall be undertaken by a test laboratory accredited to BS EN ISO/IEC 17025<sup>13</sup> for the specific tests specified.

#### 5.2 Stabilising infill

The stabilising infill shall be rounded sand in accordance with the FQP Product Declaration and in the particle range 0.2mm – 1.0mm.

The Inhalable Dust Content shall be classified as Very Low or Low (BS EN 15051).

## 6 **Installation standards**

### 6.1 Shockpad

The shockpad shall be designed and laid to ensure minimal remedial works are required when the synthetic turf carpet is removed and replaced in the future.

In-situ-laid shockpads shall be machine laid using a suitable paving machine to form one homogenous layer across the whole of the field. Continuous monitoring of climatic conditions shall be undertaken during the laying of the shockpad to ensure that materials are not laid or left to cure in conditions outside the specified working conditions of the polyurethane binder being used. These conditions shall be notified to the FMC prior to works commencing.

<sup>12</sup> BS EN ISO 9001:2015 Quality management systems. Requirements

<sup>13</sup> BS EN ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories

AGP Framework 2020				
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Prefabricated shockpads shall either be inter-locking, ribbon bonded to the base or seamed alongside / head joints in accordance with the manufacturer's instructions.

On completion of the shockpad installation, the maximum undulation under a 3m straightedge, when tested in accordance with FIFA TM 12<sup>14</sup>, shall be 10mm.

## 6.2 Synthetic turf carpet

The synthetic turf carpet shall be laid in full widths across the pitch, other than where longitudinal rolls are laid to include run-offs and tufted side-line markings.

The method of jointing / seaming, including all in-laid line markings, shall be such that no ridge, groove or creases occur. The maximum carpet seam gap shall be no greater than the tuft gauge of the carpet. No seam shall be within 300mm of any permanent inlaid line.

Bonded joints shall be formed using jointing tape of not less than 400mm wide and polyurethane glue applied evenly to either side of the tape to a minimum total width of 300mm. The strength of the bonded joints shall meet the requirements set out by World Rugby.

There shall be no tuft loops, random long tufts, loose tufts, tears, holes or melted areas, undulations, pile height variations or any other visual or manufacturing defects.

If replacement of defective carpet is deemed necessary by the Employer or their agent, this shall involve full replacement of a length and width of a carpet roll (as designed and manufactured). No patching whatsoever will be allowed without written approval of the Employer.

## 6.3 Line markings

The field shall be line marked in accordance with the *Laws of the Game - Rugby Union*<sup>15</sup>, as published by World Rugby. Wherever possible lines shall be tufted into the carpet.

Rugby markings shall take priority over any other markings and be white in colour.

Lines shall be a 100mm wide, and when measured with a steel tape be within 20mm of their specified position.

No carpet seam shall be within 300mm of any permanent inlaid line.

<sup>14</sup> FIFA Quality Programme for Football Turf - Handbook of Test Methods

<sup>15</sup> <https://laws.worldrugby.org>

AGP Framework 2020				
Employer's Requirements	06	RUGBY TURF	Version	1.1

Lines shall not deviate by more than 10mm from a line joining their ends, nor include any sudden steps. Line edges shall be parallel and uniform.

For a period of eight years following Practical Completion each line marking shall remain straight to within  $\pm 20\text{mm}$  of a tensioned string line joining its ends and all lines shall remain within  $\pm 50\text{mm}$  of their original position as measured at Practical Completion. Furthermore, no line shall exhibit any sudden irregularity or deviation greater than 10mm over a distance of 1 metre.

#### 6.4 Stabilising infill

Stabilising infill shall be installed at the rate specified by the manufacturer of the synthetic turf surfacing system. It shall be installed in dry conditions and it shall be brushed into the carpet until an even thickness at the specified application rate is achieved.

#### 6.5 Performance infill

The performance infill shall be installed at the rate recommended by the manufacturer of the synthetic turf, it shall be in a dry condition and it shall be brushed into the carpet until an even thickness of fill is achieved and the correct amount of carpet free pile above the level of the infill is present.

##### 6.5.1 Minimising environmental contamination

During the transportation, site storage and installation of the performance infill, steps shall be taken to minimise the risk of contamination of the environment by accident spillage or poor working practices resulting in infill materials contaminating the surrounding environment of the pitch and storm water drainage systems. These shall include, but not be limited to:

- Storing big-bags and palletised bags in areas that can contain any infill spillage, ensuring that it cannot be flushed into storm water drainage systems or adjacent water courses. Such areas to be cleaned on completion of the works to ensure any spilt infill is collected and disposed of in an environmentally friendly way;
- Opening bags and loading spreading machines within the synthetic turf area, whenever possible;
- Using purpose made spreading machines to apply the infill in a controlled manner that minimises the risk of infill being thrown outside the area;
- Removing any infill caught on installation (or maintenance) plant before it leaves the synthetic turf area.

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## 6.6 Field certification

Following completion of the pitch's construction the FMC/STC will arrange for it to be tested to determine if it satisfies the field testing requirements of the *Rugby Performance Specification*. The Framework Supplier shall provide the following services during this process:

1. Making the on-line application to World Rugby to allow a field test number and template report to be issued;
2. Ensure that all required site samples of synthetic turf, shockpad and infill materials are available on the site, on the day of the field test, to allow the test institute to collect them;
3. Provide a copy of the WR test report and field certificate (assuming the field has passed) to the FMC within three working days of it being issued by WR.

## 7 **Dual sports pitches**

### 7.1 Rugby Union/ Football

If the pitch is to also be used for football, the following additional requirements shall apply:

#### 7.1.1 Additional design and construction requirements

The pitch shall be designed and constructed to also allow certification at handover, in accordance with *FIFA Quality level*<sup>16</sup>.

#### 7.1.2 Additional line markings

Permanent football line markings shall be installed in accordance with the *Laws of Football*, as published by FIFA. The lines shall be yellow in colour.

#### 7.1.3 FIFA field certification

Following completion of the pitch and following any agreed period of establishment the FMC/STC will arrange for it to be tested to determine if it also satisfies the field test requirements of *FIFA Quality Programme for Football Turf – FIFA Quality level*.

The Framework Supplier shall provide the following services during this process:

<sup>16</sup> As defined in World Rugby's *Rugby Turf Performance Specification*

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1. Making an on-line application to FIFA to allow a field test number and template report to be issued;
2. Ensure that all the required site samples of synthetic turf, shockpad and infill materials are available on the site, on the day of the field test, to allow the test institute to collect them;
3. Provide a copy of the FIFA test report and field certificate (assuming the field has passed) to the FMC within three working days of it being issued by FIFA.

AGP Framework 2020				
Employer's Requirements	07	HOCKEY TURF	Version	1.1

## Foreword

This section of the Employer's Requirements specifies the performance and material requirements for the synthetic turf surfacing system laid on any synthetic turf hockey pitch procured via the AGP Framework 2020. Four categories of hockey pitch may be constructed:

- Wet – Global category
- Sand-dressed – National category (hockey and mini-hockey only)
- Sand-dressed or sand-filled - Multi-sport 1 category (hockey plus recreation football, etc)
- Sand-dressed Multi-sport 2 category (hockey plus tennis and/or netball, etc)

### 1 Intended usage

The pitch will be used for a range of hockey related activities including hockey, small-sided hockey (all forms), hockey training, general physical training and any other sports activities agreed in writing by the Framework Contractor and Employer.

It is envisaged that dual-use (school & community) pitches will be subjected to up to 80 hours use per week, and club pitches will be subjected to approximately 40 hours use per week; an indication of the predicted use being given in the Concept Design Document. The actual levels of use shall be monitored throughout the life of the field (see ER 12<sup>1</sup> for details).

The pitch shall provide a satisfactory playing environment for a minimum of eight years and its performance and compliance with the relevant competition and performance standards shall be as detailed in warranty requirements (see ER 13<sup>2</sup> for details).

Footwear will be controlled by the field operator, and the use of football studded sports shoes, will be restricted as far as possible.

### 2 Design and construction requirements

Hockey pitches shall be designed and constructed to allow certification at the category specified in the site specific Employer's Requirements, at handover and through the life of the playing surface in accordance with the *FIH Hockey Turf and Field Standards*<sup>3</sup>.

### 3 Synthetic turf surfacing quality standards

The synthetic turf surfacing system shall be an FIH Approved Product at the required category.

<sup>1</sup> ER 12 - *AGP Framework [2019-23] Maintenance*

<sup>2</sup> ER 13 - *AGP Framework [2019-23] Performance and materials warranty*

<sup>3</sup> [www.fih.ch/hockeyturf](http://www.fih.ch/hockeyturf)

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#### 4 Installation standards

##### 4.1 Shockpad

The shockpad shall be designed and laid to ensure minimal remedial works are required when the synthetic turf carpet is removed and replaced in the future.

In-situ laid shockpads shall be machine laid using a suitable paving machine to form one homogenous layer across the whole of the field. Continuous monitoring of climatic conditions shall be undertaken during the laying of the shockpad to ensure that materials are not laid or left to cure in conditions outside the specified working conditions of the polyurethane binder being used. These conditions shall be notified to the FMC prior to works commencing.

Prefabricated shockpads shall either be inter-locking, ribbon bonded to the base or seamed alongside and head joints in accordance with the manufacturer's instructions.

On completion of the shockpad installation the maximum undulation under a 3m straightedge, when tested in accordance with FIFA TM 12<sup>4</sup>, shall be 6mm.

##### 4.2 Synthetic turf carpet

The synthetic turf carpet shall be laid in accordance with *Part 3 of the FIH Hockey Turf and Field Standards*<sup>5</sup>.

The method of jointing / seaming, including all in-laid line markings, shall be such that no ridge, groove or creases occur. The maximum carpet seam gap shall be no greater than the tuft gauge of the carpet. No seam shall be within 300mm of any permanent inlaid line.

Bonded joints shall be formed using jointing tape of not less than 400mm wide and polyurethane glue applied evenly to either side of the tape to a minimum total width of 300mm. The strength of the bonded joints shall meet the requirements set out in FIH Standards.

There shall be no tuft loops, random long tufts, loose tufts, tears, holes or melted areas, undulations, pile height variations or any other visual or manufacturing defects.

If replacement of defective carpet is deemed necessary by the Employer or their agent, this shall involve full replacement of a length and width of a carpet roll (as designed and manufactured). No patching whatsoever will be allowed without written approval of the Employer.

<sup>4</sup> FIFA Quality Programme for Football Turf - Handbook of Test Methods

<sup>5</sup> FIH Hockey Turf and Field Standards. Part 3. Requirements for Hockey Fields

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#### 4.3 Line markings

The field shall be line marked in accordance with the Rules of Hockey, as published by FIH. Wherever possible lines shall be tufted into the carpet.

Hockey markings shall take priority over any other markings and be white in colour.

Lines shall be a single width between 75mm wide and (when measured with a steel tape) within 20mm of their specified position.

Unless specified in the Concept Design Document the dashed 5m lines outside the shooting circle are only required on Global category pitches.

No carpet seam shall be within 300mm of any permanent inlaid line.

Straight lines shall not deviate by more than 10mm from a line joining their ends, nor include any sudden steps. Line edges shall be parallel and uniform.

For a period of five years following Practical Completion each straight-line marking shall remain straight to within +/- 20mm of a tensioned string line joining its ends and all lines shall remain within +/- 50mm of their original position as measured at Practical Completion. Furthermore, no line shall exhibit any sudden irregularity or deviation greater than 10mm over a distance of 1 metre.

#### 4.4 Stabilising infill

Stabilising infill shall be installed at the rate specified by the manufacturer of the synthetic turf surfacing system. It shall be installed in dry conditions and it shall be brushed into the carpet until an even thickness at the specified application rate is achieved.

### 5 **Pitch irrigation**

Global category wet fields shall be irrigated using an automated irrigation system as follows:

#### 5.1 Performance Requirements

The irrigation system shall meet the performance requirements detailed in the *FIH Hockey Turf and Field Standards* and the specific irrigation requirements of the hockey turf being installed<sup>6</sup>.

<sup>6</sup> As defined in the FIH Product Approval test report

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## 5.2 Irrigation system

The irrigation system emitters shall be pop-up sprinklers or rain guns with 90° or 180° sectoring capability. The system shall have adequate frost protection measures for the specific site. The system shall comprise:

- 1 Water storage facility
- 2 Pump house
- 3 Pump station
- 4 Underground pipework
- 5 Control valves
- 6 Emitters
- 7 Control system

## 5.3 Application time requirements

The pitch shall be irrigated by means of six emitters, which shall either be pop-up sprinklers or rain guns, as specified in the. If specified in the Concept Design Document, goal line sprinklers shall also be installed at each end, to allow short corner/penalty practice to take place without the need to run the main irrigation system.

The irrigation control system shall allow varying cycles and individual programs to ensure the entire playing area and surrounds can be watered. It shall allow the following cycles:

- 10 minutes
- 5 minutes
- Single station activation

## 5.4 Pumping equipment

Pumps shall be initiated by inter-linked speed control units which shall ensure reduced wear on valve, pipework and emitter equipment and optimise power consumption.

## 5.5 Pipework and valve installation

All pipework and fittings installed shall be manufactured in polyethylene to relevant BSEN Standards.

Isolating valves shall be installed at all necessary points to allow system maintenance operations, and drain valves shall be included, as required.

Any exposed pipework shall be insulated to guard against frost damage and padded where it is adjacent to areas of pedestrian or player movement.

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#### 5.6 Control Equipment

The control system shall allow for the operation of the pitch irrigation system as a unit or individual irrigation emitters.

Emitters shall be individually controlled by dedicated diaphragm operated solenoid valves and the control panel shall be capable of operating these individually or in matched arc pairs.

Application rates shall be adjustable by varying the run time of the emitters and the control panel shall be capable of operating in minutes and seconds.

#### 6 **FIH field certification**

Following completion of the pitch the FMC/STC will arrange for it to be tested to determine if it satisfies the relevant category of performance, as defined in Part 3 of the *FIH Hockey Turf and Field Standards*.

The Framework Contractor shall provide the following services during this process:

1. Ensure that all the required samples of synthetic turf, shockpad and infill materials are available on the site, on the day of the field test, to allow the test institute to collect them;
2. Provide a copy of the FIH test report and field certificate (assuming the field has passed) to the FMC within three working days of it being issued by FIH.

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## 1 Introduction

Perimeter fencing shall be erected around the pitch to contain balls, to protect the playing surface from contamination and to help prevent unauthorised use and vandalism. The precise layout of the fencing (heights, position, goal storage recesses and number of gates, etc) shall be as detailed in the Concept Design Document.

At least one pair of double gates shall be provided to allow maintenance and emergency vehicle access.

Single gate access shall be provided to allow direct access to each section of pitch available for cross-pitch use and to the furthest section of the pitch from the main/spectator entrance, to aid ball retrieval.

Equipment storage compounds shall be incorporated into the fencing to provide suitably sized recesses to accommodate and anchor portable goals. The recess design shall ensure there is sufficient height clearance to prevent cranial and thoracic injury. The design shall ensure it is easy to retrieve balls from the recesses and goals can be stored and anchored safely.

All fencing works shall be undertaken in accordance with the SAPCA Code of Practice for Fencing Systems.

Migration of polymeric infills from synthetic turf pitches into the surrounding environment has been identified as a source of microplastic pollution. In order to minimise this problem all pitches shall include containment methods as detailed in sections 6 and 7 of this document. The requirements are based on the draft proposals of CEN TC 217. The drawings at the rear of this document have been produced by Sport England and show examples of what is required.

## 2 Type of fencing

Unless otherwise specified in the Concept Design Document, fencing shall be constructed from twin bar super-rebound panels that are supported by box section posts. The fencing shall comply with the *Repeated Impact Resistance to Footballs and Kicks* requirements of BS EN 15312<sup>1</sup>.

<sup>1</sup> BS EN 15312:2007+A1:2010 Free access multi-sports equipment. Requirements, including safety, and test methods

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### 3 Height of fencing

#### 3.1 Football and rugby pitches

Unless otherwise specified in the Concept Design Document, fencing on all sides of the pitch shall be 4.5m high. Internal spectator areas shall be separated from the field of play by 1.1m high (minimum) fencing that incorporates a top (leaning) rail. If spectator areas are located behind goals, the fencing height shall be 2m.

#### 3.2 Hockey pitches

Unless otherwise specified in the Concept Design Document, fencing on the sides of the pitch shall be 3.0m high and 4.5m high behind the end lines for the width of the shooting circles.

Internal spectator areas shall be separated from the field of play by 1.2m high fencing that incorporates a top (leaning) rail. If spectator areas are located behind goals, the fencing height shall be 4.5m for at least the width of the shooting circles.

Kickboards in accordance with clause 8 of this document shall be mounted to the bottom of all fencing surrounding the field of play.

### 4 Materials

#### 4.1 Steelwork

Steelwork shall be in accordance with the relevant parts of Section 1.3 of the *SAPCA Code of Practice for Fencing Systems for Sports Facilities*<sup>2</sup>.

#### 4.2 Protective treatment

All metalwork shall be hot dip galvanised in accordance with BS EN ISO 1461. Care must be taken to ensure that no sharp edges are left after galvanising. If the galvanised steelwork is to be painted after erection a mordant wash shall be applied prior to painting.

Bolts and nuts for fixing shall be galvanised or stainless steel.

Unless specified differently in the CDD all fencing shall be dark green in colour. Powder coating shall be in accordance with BS1722-16<sup>3</sup>.

<sup>2</sup> *The SAPCA Code of Practice for the Construction and Maintenance of Fencing Systems for Sports Facilities*

<sup>3</sup> BS 1722-16:2009 Fences. Specification for powder coatings used as a plastics finish to components and mesh

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For installations within 500m of saltwater or estuary powder coatings shall be marine quality.

## 5 Gates and gate frames

Gates shall be provided in the positions shown on the layout drawing in the CDD. Every field shall have at least two entry egress points.

Access gates shall open outwards away from the playing area to ensure the safety of players.

Single leaf main access gate frames shall be a minimum of 2m high and 1.2m wide. The space above the gate should be in filled with a panel to suit. The gates shall have lockable slide latch/bars and a drop-bolt, with open and closed drop-pin sockets, set in concrete. Gate handles should not protrude into the pitch.

Double Leaf Gates should be a minimum of 2.5m wide x 3m high. The gate and the space above should be in filled with a welded mesh panel to match the rest of the fencing system. The gates shall have lockable slide latch/bar and lockable drop-bolts to each leaf, with open and closed drop-pin sockets, set in concrete. Handles should not protrude into the pitch. Whenever possible the gates should open through 180° so they close against the back of the fence.

## 6 Entrance-way boot cleaning mats

At all (single and double) entrances to the pitch, decontamination mats shall be installed. They may comprise:

- Heavy duty rubber scraper mats
- Heavy duty honey-comb profile mats
- Smooth bar industrial grates – decontamination gates

The mat shall be the full width of the entrance gate and at least 1.5m long. It shall be positioned immediately adjacent to gate, either internally, when located in a paved surround/spectator area, or externally, when the synthetic turf surfacing is laid to the perimeter fence.

The mats shall be set in recessed concrete bases that will contain any infill or other detritus being taken off or onto the pitch by players' footwear or maintenance equipment, etc. The base shall contain a suitable drainage outlet with a suitably sized mud-buckets/filters to capture any infill and prevent it being washed into the drainage system. The design of the mat shall allow water to flow to the outlet drain (i.e. it shall not sit flat on the concrete base).

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## 7 Perimeter Infill Containment Barrier

To minimise the risk of polymeric infills migrating from the pitch into the surrounding environment, all pitch perimeter fencing systems shall incorporate some form of barrier that is designed to prevent the infill from leaving the pitch through wind or water erosion. The barrier may take the form of:

- Solid panels (typically 500mm in height) incorporated into the lower section of the fence, mounted so they sit flush with the ground and do not allow infill to migrate under them;
- 200mm (minimum) x 38mm high tanalised timber kickboards mounted to the fence panels mounted so they sit flush with the ground and do not allow infill to migrate under them;
- Raised pre-cast concrete edgings or kerbs (minimum 200mm high) located inside and adjacent to the fence line;
- Cast concrete plinth/kerb (minimum 200mm high) on which the perimeter fencing is mounted.

Note – when determining the height of the Perimeter Infill Containment Barrier see also the requirements of Clause 1 of ER 11.

## 8 Kick boards

Kickboards shall be sawn timber or UV stabilised impact resistant plastic composite. Timber boards shall be vacuum pressure impregnated (Tanalith E or similar) softwood timber and be in accordance with Class 4 as defined in BS EN 335<sup>4</sup>. The end of each board shall be secured to each post with a minimum 2 no 8 mm CSH (dome headed) bolts.

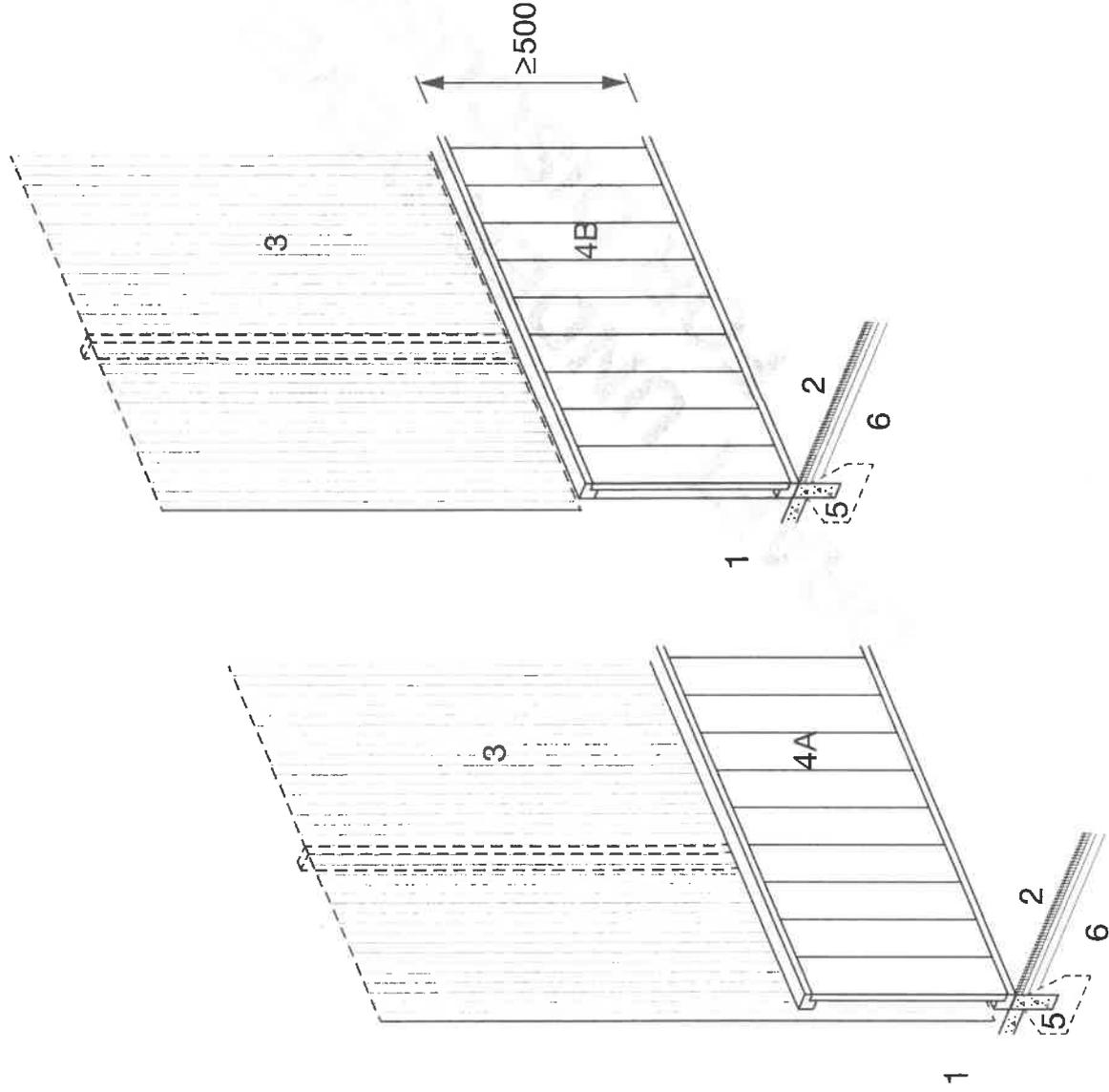
### 8.1 Hockey pitches

Kick-boards shall be a minimum 250 x 38mm.

<sup>4</sup> BS EN 335:2013 Durability of wood and wood-based products. Use classes: definitions, application to solid wood and wood-based products

## FIELD DESIGN EXAMPLE 1

Pitch Perimeter: Solid rebound fencing with retrofit and new-build options



### Key:

- 1 Adjacent areas
- 2 Pitch run-off area surfacing
- 3 Fencing
- 4 Solid rebound boarding system  
(Option A - retrofitting adjacent to existing fencing;  
Option B - in lieu of fencing at low level)
- 5 Precast concrete pitch edging
- 6 Suitable substrate (not indicated)

Note: Indicative dimensions are in millimetres

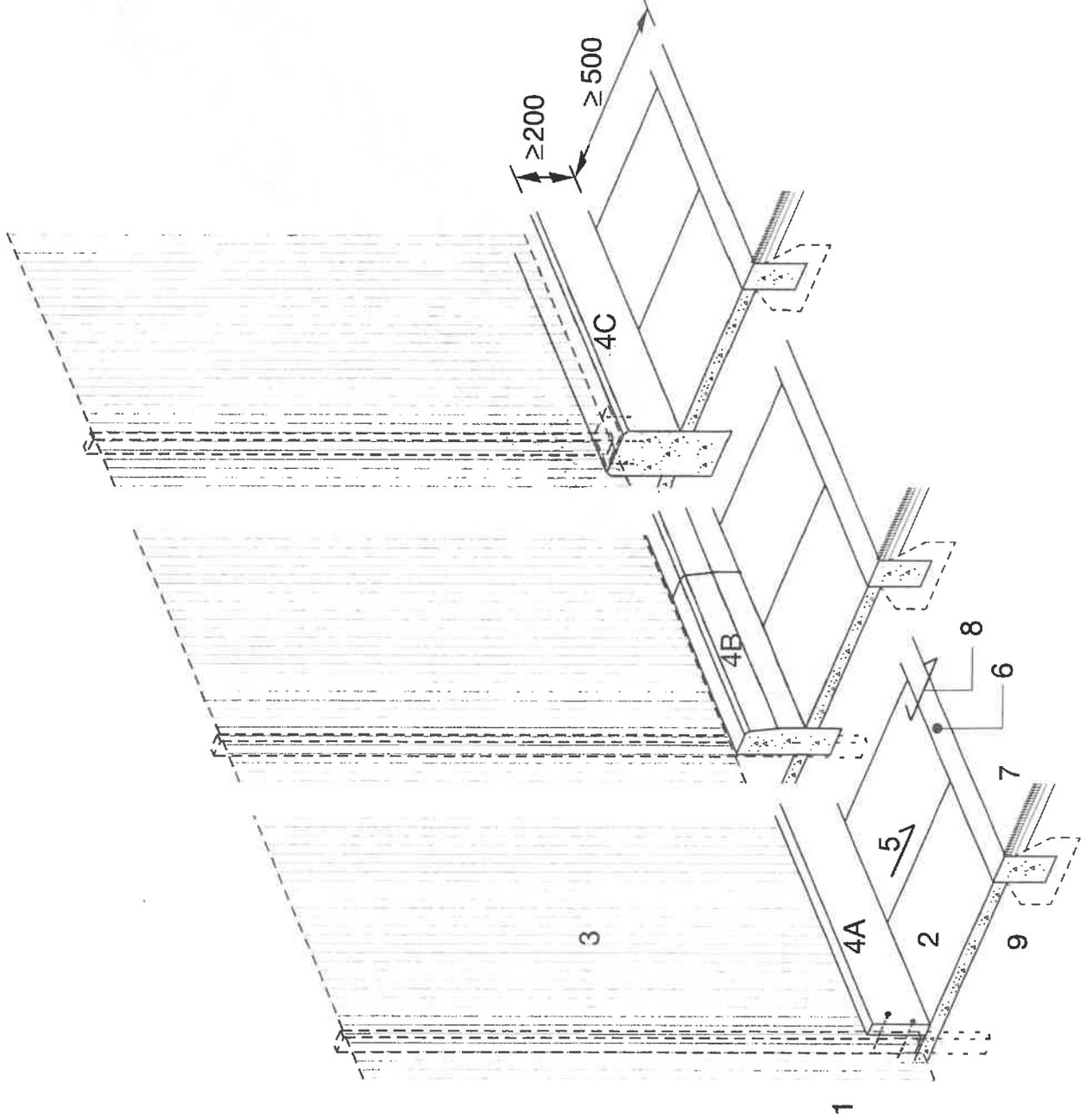
## FIELD DESIGN EXAMPLE 2

Pitch Perimeter: Paved margin with edge barrier options

### Key:

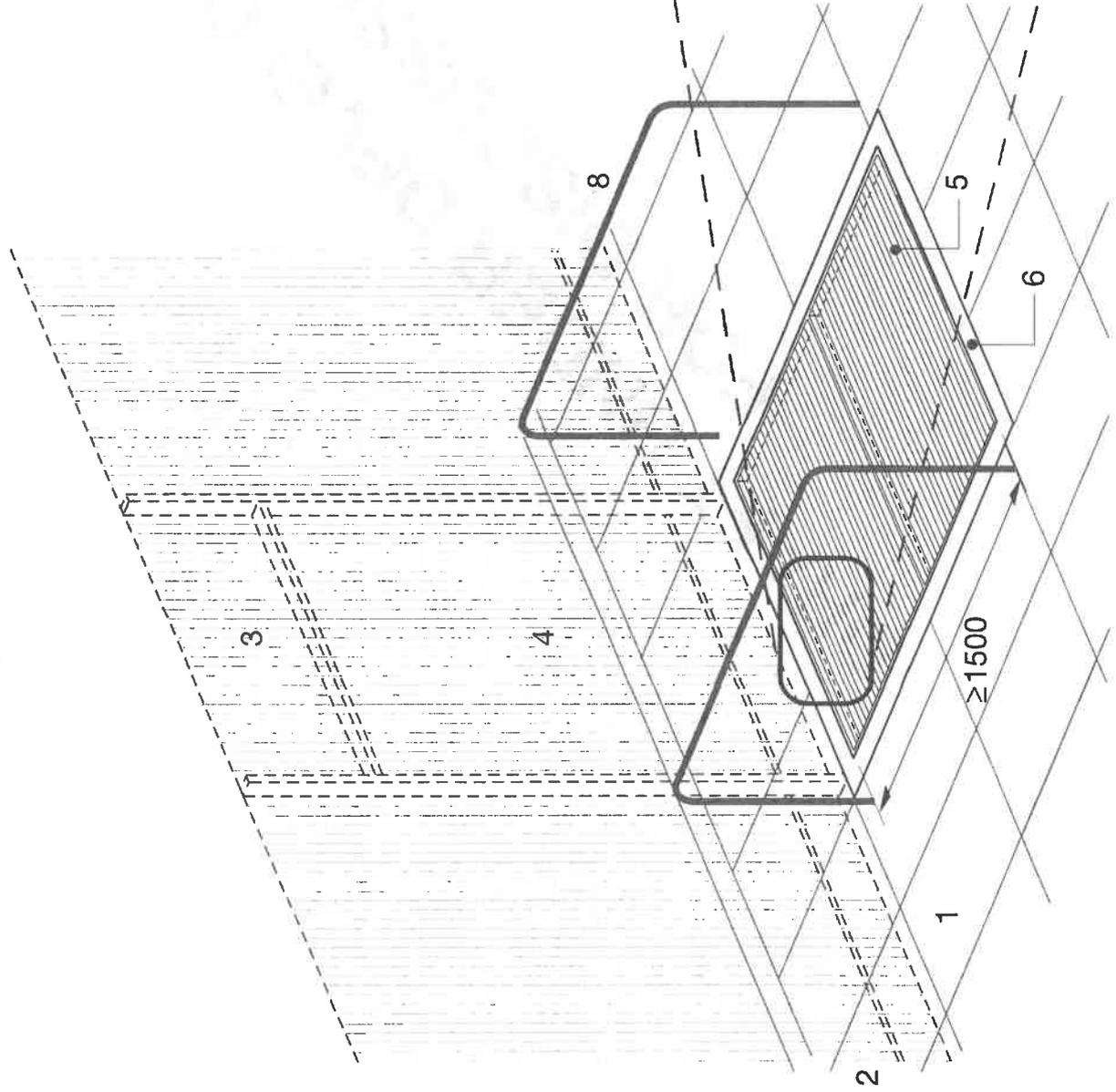
- 1 Adjacent areas
- 2 Pitch side
- 3 Fencing
- 4 Solid edge barriers minimum 200 mm high above paving (Option A - planks; Option B - pre-cast concrete; Option C - cast concrete)
- 5 Concrete paving slabs (or equivalent) sloped towards pitch
- 6 Concrete edging surrounds
- 7 Pitch run-off area surfacing
- 8 Flush surfaces for level access
- 9 Suitable substrate (not indicated)

Note: Indicative dimensions are in millimetres



### FIELD DESIGN EXAMPLE 3

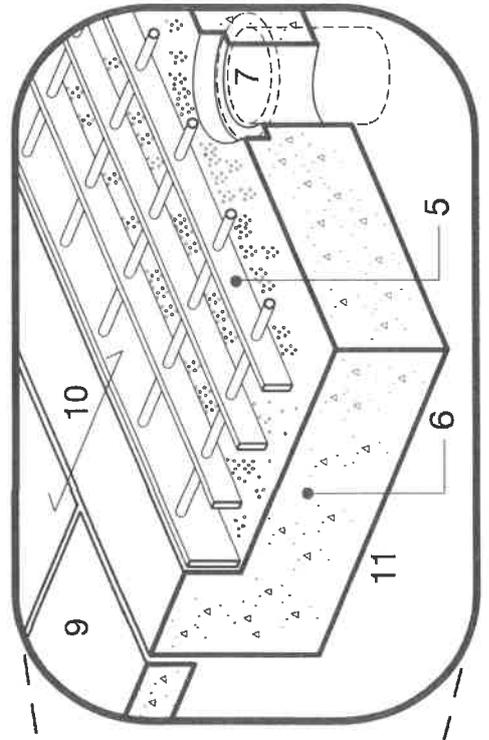
Pitch Entrance: Gate and Grating



**Key:**

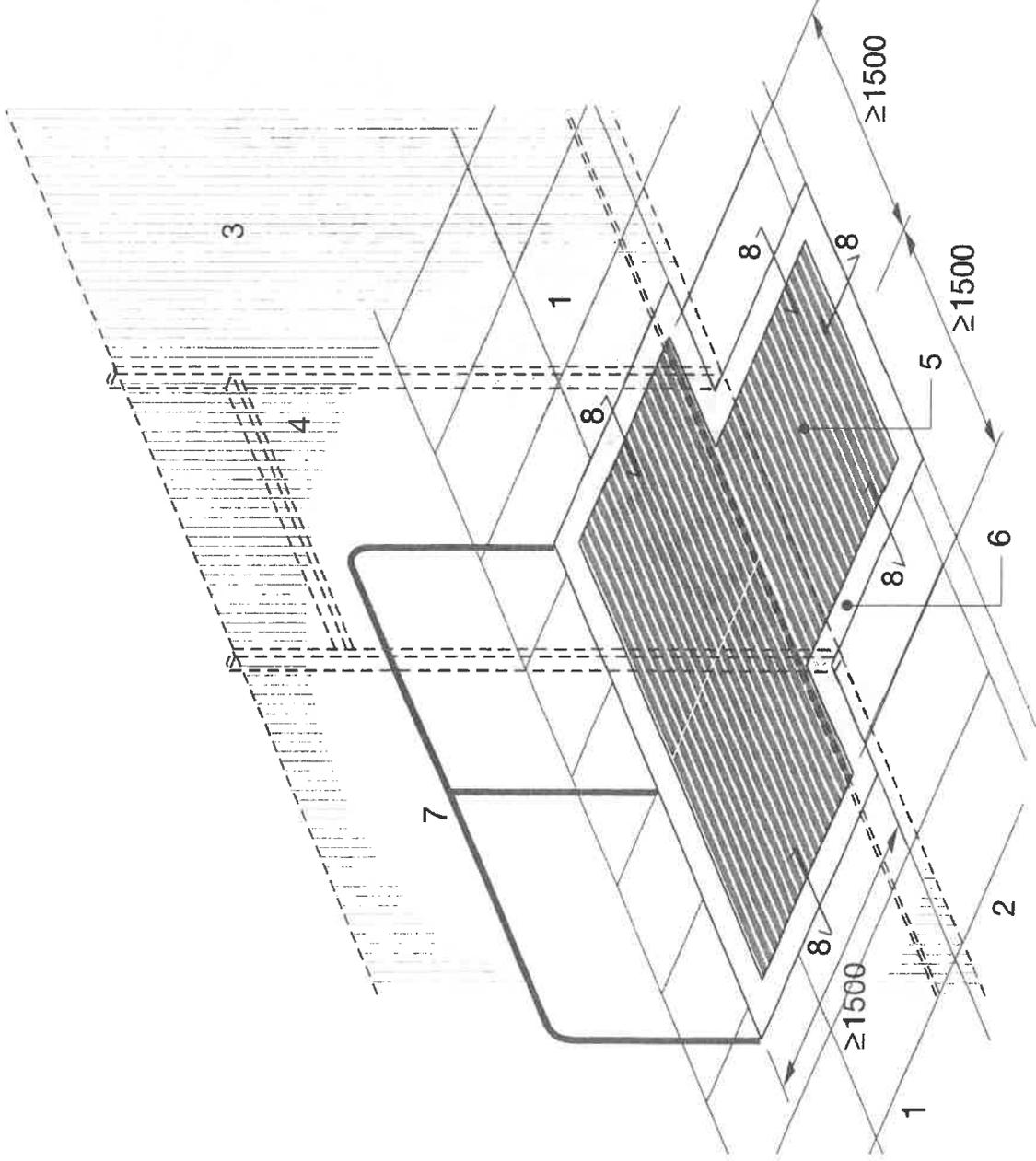
- 1 Approach (or pitch) side
- 2 Pitch (or approach) side
- 3 Fencing
- 4 Gate
- 5 Removable recessed grating panels with space below for rainwater discharge
- 6 Concrete base and edging surrounds
- 7 Interception drainage and filters / silt traps
- 8 Control barrier / fence
- 9 Concrete paving slabs (or equivalent)
- 10 Flush surfaces for level access
- 11 Suitable substrate (not indicated)

Note: Indicative dimensions are in millimetres



## FIELD DESIGN EXAMPLE 4

Pitch Entrance: Gate, control fence and matting or grating



### Key:

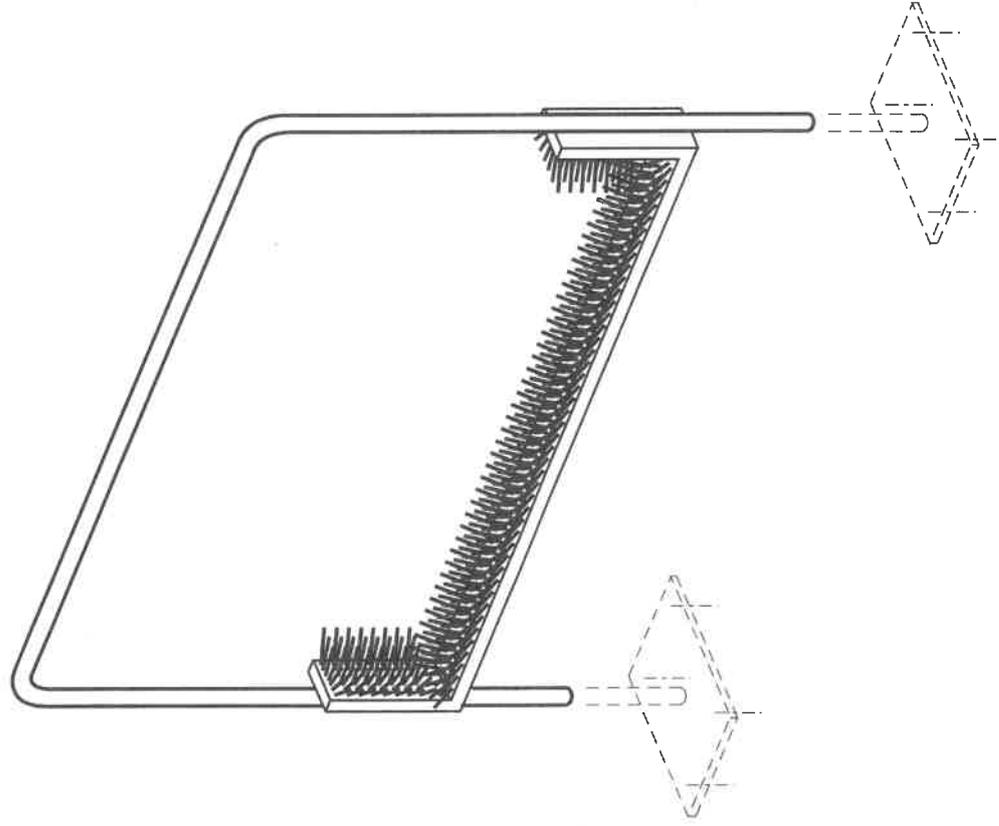
- 1 Approach side
- 2 Pitch side
- 3 Fencing
- 4 Gate
- 5 Precast matted panels or removable metal grating panels
- 6 Concrete base and edging surrounds
- 7 Control barrier / fence
- 8 Flush surfaces for level access

Note: Indicative dimensions are in millimetres

Infill Containment Methods

## FIELD DESIGN EXAMPLE 5

Pitch Exit: Boot cleaning brush



AGP Framework 2020				
Employer's Requirements	09	SPORTS EQUIPMENT	Version	1.1

## Foreword

This section of the Employer's Requirements specifies the standards for sports equipment supplied by the Framework Supplier to synthetic turf pitch procured via the AGP Framework 2020.

Note: It is possible that during the period of the AGP Framework 2020 the Football Foundation may decide to supply sports equipment directly to pitches or nominate one or more suppliers. In this eventuality, the Framework Supplier shall undertake all necessary works to facilitate the supply and erection of the sports equipment.

All Sports Equipment (including goal nets) shall have been independently tested and certified as complying with the standards specified.

### 1 Football

#### 1.1 Full size socketed football goals

Full size socketed football goals with nets shall comply with BS EN 748<sup>1</sup>.

#### 1.2 Portable and small-sided football goals

Portable and small-sided football goals (U11/U12 9v9, U9/U10 7v7 and U7/U8 5v5) with nets shall comply with BS EN 16579.

### 2 Rugby goals

Rugby goals shall comply with BS EN 16579<sup>2</sup>.

Post protectors shall be supplied with all rugby goals. The protectors shall comprise high density foam covered with PVC and have Velcro fasteners. They shall be >1.8m in height and > 300mm in depth. The protectors design shall meet World Rugby recommendations

### 3 Hockey goals

Hockey goals with nets shall comply with BS EN 750<sup>3</sup>. They shall comprise Aluminium Self Weighted Hockey Goals with backboards manufactured from 475mm high 25mm solid polyethylene. Nets shall be heavy duty twine.

<sup>1</sup> BS EN 748:2004 Playing field equipment. Football goals. Functional and safety requirements, test methods

<sup>2</sup> BS 16579: 2018 Playing field equipment - Portable and permanent socketed goals - Functional, safety requirements and test methods

<sup>3</sup> BS EN 750:2004 Playing field equipment. Hockey goals. Functional and safety requirements, test methods

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#### 4 Corner flags

Flexible pole corner flags shall be installed. If socketed goals are specified in the Concept Design Document, the sockets shall be set in concrete footings in accordance with the manufacturer's specification.

#### 5 Pitch division nets

Pitch division nets shall comprise 100mm square powder coated square posts, with heavy duty netting.

The cable winch shall comprise a brake winch and top pulley wheel, detachable handle and a maximum load rating restricted to 100kg.

#### 6 Team benches / shelters

Team shelters shall be approximately 2.1m high by 1.3m deep with eight seats (unless an alternative number of seats are specified in the CDD). The shelter frames and panels shall be manufactured from aluminium and all metal work shall be powder coated. Windows/roof panels shall be shatter resistant UV stabilised 3mm polycarbonate. Seats shall be injection moulded polypropylene, or similar. The Benches shall be bolted down to a concrete base.

#### 7 Boot cleaning stations

Boot cleaning stations shall be provided at the main access points to all long pile synthetic turf surfaces to enable players to remove detritus and infill from their footwear before entering and leaving the pitch. Signs to promote boot cleaning shall be erected at each access point.

AGP Framework 2020				
Employer's Requirements	10	SPORTS LIGHTING	Version	1.1

## 1 General

A LED sports lighting system shall be designed and installed to illuminate the pitch to the standards relevant for its intended use. The performance of the system shall be in accordance with the relevant sport's governing body requirements, BS EN 12193<sup>1</sup> and *Sport England's Design Guidance Note – Artificial Sports Lighting*<sup>2</sup> and the general design principles outlined in the *CIBSE LG4 Sports Lighting*. It shall also ensure compliance with all relevant planning restrictions and conditions, as detailed in the Concept Design Document.

Note: It is possible that during the period of the AGP Framework 2020 the Football Foundation may decide to supply sports lighting directly to pitches or nominate one or more suppliers. In this eventuality, the Framework Supplier shall undertake all necessary works to facilitate the supply and erection of the sports equipment.

## 2 Definitions

$E_{max}$	Maximum pitch illuminance on a surface at a specific point
$E_{min}$	Minimum pitch illuminance on a surface at a specific point
$E_{ave}$	Average horizontal illuminance
$E_{h\ maintain}$	Minimum horizontal maintained illumination
$U_1$	Minimum/Maximum illuminance
$U_2$	Minimum/Average illuminance

## 3 Performance requirements

### 3.1 Football

Sports lighting shall be in accordance with FA guidance<sup>3</sup> and all relevant competition requirements as specified in the Concept Design Document. The lighting system shall also allow the whole pitch to be lit at 120 lux ( $E_{ave}$ ) for training activities.

FA Level	$E_{ave}$	$E_{min}$	$U_1$	$U_2$	Glare Rating
Step 1	250 lux	150 lux	$\geq 0.30$	$\geq 0.6$	< 50
Step 2 and below	200 lux	120 lux	$\geq 0.30$	$\geq 0.60$	

<sup>1</sup> BS EN 12193:2018 Light and lighting. Sports lighting

<sup>2</sup> <https://www.sportengland.org/facilities-planning/design-and-cost-guidance/artificial-sports-facilities/>

<sup>3</sup> The FA Guide to Floodlighting 2019 edition – [www.thefa.com](http://www.thefa.com)

AGP Framework 2020				
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### 3.2 Rugby

Sports lighting shall be in accordance with RFU guidance<sup>4</sup> and all relevant competition requirements as specified in the Concept Design Document

	RFU Levels 2 – 5		RFU Levels 6 – 12	
	Match pitch	Training pitch	Match pitch	Training pitch
E <sub>h maintain</sub>	200 lux	100 lux	100 lux	100 lux
U <sub>2</sub>	0.6	0.5	0.5	0.5
Glare	< 50	< 55	< 55	< 55
Colour (Ra)	> 60	> 20	> 20	> 20

### 3.3 Hockey

Sports lighting shall be in accordance with England Hockey and FIH guidance<sup>5</sup> for lighting for non-televised hockey and all relevant competition requirements, as specified in the Concept Design Document.

The lighting system shall also allow the whole pitch to be lit to the development and community level training category as detailed in the FIH guide and detailed below.

Class of play	E <sub>h maintain</sub> lux	Horizontal uniformity ratio		Colour Rendering Index	Glare Rating	Colour Temp
		U1	U2			
Class I	> 350	> 0.50	> 0.70	≥ 65	< 50	>4000K
Class II	> 500	> 0.50	> 0.70			
<i>Development &amp; community level training</i>	> 200	> 0.40	> 0.60			

## 4 Installation standards

The complete installation shall be carried out in accordance with the current edition of the IEE wiring regulations and BS 7671<sup>6</sup>.

<sup>4</sup> Floodlighting Installation and Management Guide – [www.englandrugby.com](http://www.englandrugby.com)

<sup>5</sup> FIH Facilities Guidance *Sports lighting for non-televised outdoor hockey* - [www.fih.ch/facilities](http://www.fih.ch/facilities)

<sup>6</sup> BS 7671:2018 Requirements for Electrical Installations. IET Wiring Regulations

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## 5 Information to be submitted as part of the Contractor's Proposals

The following information shall be included in the Contractor's Proposals for any pitch being procured via the AGP Framework (2019-2023):

- A full lighting design including product datasheets and energy consumption data. This shall include a computer plot to identify the predicted illumination levels and uniformity that will be achieved by the proposed selection and layout of equipment;
- Lighting Spill drawings A prediction of the horizontal light "spillage" over a 20m margin around the pitch that will be experienced from the proposed system. Drawings to show both horizontal illuminance at ground level and vertical levels at 0m, 1.5m and 3m above ground level. Drawings to use lighting contours for 2 Lux, 5, Lux, 10 Lux and 25 Lux (unless other required for ecological impact). Use initial lamp lumens and a Maintenance Factor of 1.0 for all spill calculations. All lighting design drawings are to be provided at a scale of 1:500.
- A statement on the extent to which provision has been made to control glare from the proposed arrangement of luminaires.
- A schedule to identify the make and types of equipment proposed, with particular attention to the characteristics of the type(s) of lamp offered.
- The quantity, height and location of columns.
- Column and foundation designs to meet manufacturer's guidelines and requirements for mast loading
- The power loading and from this the predicted running cost/hour.
- A minimum 10-year life-cycle cost to include maintenance, parts replacement, and necessary re-lamping;
- Warranty documentation that clearly states what is covered. The warranty shall include guaranteed light levels (performance), parts, labour, and lamp replacements. The minimum warranty period shall be five years.

## 6 Electricity Supply

The Framework Contractor shall determine if an adequate electricity supply is available or if a new Three Phase, 400/230 Volt, 50 Hz, A.C. is required. If a new supply is required, the Framework Contractor shall assume full responsibility for organising the power supply.

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## 7 Luminaires

Luminaires, fitted with LED lamps, shall include / comply with:

- Optics – Flat style optics (max glass elevation 15°) or standard optics fitted with baffles or cowls
- Maximum Upward Light Output Ratio (ULOR) – 5%
- Colour Quality - Minimum Ra80, CCT 4000K
- Efficacy - >120Lm/W
- Body – Die Cast Aluminium
- Finished – Self Finished Aluminium or Powder Coated
- Front Glass - Impact Resistant Toughened Glass (Minimum IK08)
- Ingress Protection – IP65(Optics and Driver Housing)
- Aiming – Protractor aiming device or Gunsight
- Driver – Integral mounted on stirrup or within floodlight housing
- Or Remote in IP55 Galvanised Steel or GRP Cabinet
- Dimming – Full and 50% or Variable using programmable DALI type driver
- Mounting – Surface mounted or underslung via a galvanised stirrup to meet manufacturer requirements.
- Fixings – Stainless Steel
- LED Life – Minimum 40,000 Hrs
- Maximum total power – less than 20KW for a full size 11v11 pitch
- Maintenance Factor – 0.90 (Maximum)

## 8 Control features

All necessary switching for control of the lighting combinations specified in the Concept Design Document shall be provided. There shall be a display that shows the logged hours run for each lamp group.

When not specifically specified the switching system shall include dimming and zonal control for split pitch use for halves/thirds/quarters

Control equipment within the feeder pillar shall be clearly engraved to indicate which area they control.

## 9 Columns

Lighting columns shall be complete with pre-wired control gear in single door column cabinet for the satisfactory operation of each floodlight. Sufficient space shall be provided for remote I/O controllers, controlling contactors and MCB type enclosures.

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An IP65 30mA RCD protected 13A socket outlet shall be provided within each lighting column base cabinet.

All metal components shall be galvanised to BS 729.

## 10 Cables

Correctly rated XPLE cables shall be installed between, the distribution board and all columns, and between the floodlighting switchgear panel and the control station.

The volt drop on the sub-main supply cable shall not exceed 1.5% of the supply voltage on full load, when measured at the incoming terminals of the feeder pillar.

### 10.1 Cables in soft ground

Cables in the soft ground shall be buried to a minimum depth of 600mm and laid in a trench. Where applicable and in accordance with the IEE Wiring Regulations, the cables shall be laid on a bed and surround of sand 150mm thick.

Buried cables shall be identified along their entire length in the service trench with a yellow marker tape installed 150mm from ground level. The marker tape to be labelled "DANGER – ELECTRIC CABLE BELOW".

Cables shall be designed, installed and terminated in accordance with BS 7671<sup>7</sup>.

Cables shall be SWA type. Low Smoke Zero Halogen.

Where appropriate the contractor shall run an additional earthing cable with the mains cable to ensure disconnection times are met for the circuit. This cable shall be a minimum of 16 mm<sup>2</sup>.

All cable shall have copper conductors.

### 10.2 Ducting

Cables below paved ground shall run in continuous PVC ducts with cable draw-in pits near each column. Ducting shall be buried to a minimum depth of 600mm and draw pits shall be a minimum of 450 by 450mm square.

Draw pits shall be pre-formed and positioned prior to the installation of the ducting. Where stacked plastic sectional draw pits are used the duct entries shall be drilled to avoid weakening of the

<sup>7</sup> BS 7671:2018 Requirements for Electrical Installations. IET Wiring Regulations

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structure. The draw-pits shall have lockable removable lids and be provided at each floodlight column position and at all changes of direction.

#### **11 RCD protected socket**

Unless specified differently, a single, RCD protected socket outlet shall be provided.

#### **12 Testing and Commissioning**

On completion, the lighting system shall be tested in accordance with the relevant sport's governing body requirements to demonstrate satisfactory performance. Electrical and illumination test certificates shall be provided to the FMC prior to handover.

An Operating and Maintenance Manual shall be provided at handover containing, but not limited to, record drawings of the groundworks, wiring diagrams, test certificates and all other information required for the safe and economic operation and maintenance of the lighting system.

#### **13 Warranty**

The Framework Supplier shall provide a minimum ten year's manufacturer warranty on all luminaire components including LED Modules and Drivers.

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## 1 Perimeter margins

To minimise the potential for infill migration from the 3G synthetic turf surface to the surrounding environment, paved perimeter margins shall be constructed on all boundaries wherever:

- a. There is no paved (spectator) area adjacent to the synthetic turf
- b. The height of the perimeter infill containment barrier (see ER 08 clause 7) is less than 500mm

Margins shall be a minimum of 0.5m wide and slope inwards towards the synthetic turf pitch, typically with a fall of 0.5%.

## 2 Spectator areas

Paved perimeter margins shall be as detailed in the CDD. They shall slope inwards towards the synthetic turf pitch, typically with a fall of 0.5%.

## 3 Accessways

Paved access pathways shall be provided to all main access points to the pitch (pedestrian and vehicle), as detailed in the CDD. They shall be fenced to ensure players and spectators do not walk debris onto the pitch.

Pedestrian paths shall be a minimum of 1.8m in width, unless there are unavoidable pinch points where the width can be reduced to 1.2m for no greater than 6m in length.

Vehicle access routes shall be a minimum of 2.5m wide.

Access routes shall be level or have the shallowest gradients possible. Where the route is steeper than 1:60, but not as steep as 1:20, it shall have a level landing for each 0.5m rise along the route in accordance with *Sport England's Design Guidance Note - Accessible Sports Facilities*<sup>1</sup>.

A minimum clear height of 2.1m shall be maintained under trees, canopies etc.

## 4 Construction

### 4.1 Sub-base

Greater than 150 mm thick constructed from aggregate material in accordance with Highway Agency's Specification for Highway Works, Clause 803 (SHW 803) Type 1 or 3.

<sup>1</sup> available from [www.sportengland.org](http://www.sportengland.org)

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#### 4.2 Kerbs /edge detail

##### 4.2.1 Asphalt surfacing

Hydraulic pressed pre-cast concrete (PCC) edgings to BS EN 1339<sup>2</sup>, 150 (deep) x 50 (wide) x 914 (long) mm. To be installed on a suitable concrete bed and haunch to BS EN 206<sup>3</sup> using concrete in accordance with BS 8500. Any gaps between kerbs shall be less than 10 mm wide.

##### 4.2.2 Block paving

Supply and lay on 100mm concrete bed and haunch, 200 x 100 x 60mm block pavers as edge restraint, to lines and curves.

#### 4.3 Surface drainage

Surface water drainage (gully drains, slot drains, etc) shall be provided to all paved areas (spectator areas, perimeter margins, equipment storage compounds, etc.) adjacent to the pitch.

If the pitch contains a polymeric infill (SBR, EPDM, etc) the drainage system shall include trash boxes with suitably sized mud-buckets/filters to capture any infill being washed into the drainage system.

#### 4.4 Surfacing

##### 4.4.1 Asphalt surfacing

Open textured macadam comprising a 40mm thick 0/20mm Base Layer and a 25mm thick 0/6mm Wearing Layer. All aggregates shall be granite, or grit stone, frost resistant material in accordance with BS EN 13108-1<sup>4</sup>.

##### 4.4.2 Block paving

All work to comply with BS 7533 - 3<sup>5</sup>

Supply and lay on 25-40mm zone 2 sand bed, 200 x 100 x 60mm block pavers to falls and levels. Include all cuts and sealing of joints with silica jointing sand.

<sup>2</sup> BS EN 1339 :2003 Concrete paving flags. Requirements and test methods

<sup>3</sup> BS EN 206:2013+A1:2016 Concrete. Specification, performance, production and conformity

<sup>4</sup> BS EN 13108-1: 2016 Bituminous mixtures. Material specifications. Asphalt Concrete

<sup>5</sup> BS 7533-3:2005+A1:2009 Pavements constructed with clay, natural stone or concrete pavers. Code of practice for laying precast concrete paving blocks and clay pavers for flexible pavements

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Inspect paving after 4-6 weeks and top up any empty joints with dry silica jointing sand.

## 5 Lighting

Amenity lighting shall be installed along main access routes to the pitch.

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## 1 Maintenance equipment

The Framework Supplier shall supply all the maintenance equipment required to maintain the pitch to ensure performance and life expectancy is in accordance with the performance warranty requirements of the AGP Framework 2020. This shall include:

	Football and rugby pitches	Hockey pitches
Suitable mini tractor	✓	✓
Zigzag, or oscillating brush	✓	
Static brush (for hockey surfaces)		✓
Decompaction tines	✓	
20 x 25kg bags of performance infill for localised top dressing, together with a suitable storage container to ensure any spilt infill does not migrate into the surrounding environment	✓	
Infill depth gauge – not applicable for hockey pitches	✓	
Free pile measuring gauge– not applicable for hockey pitches	✓	
Ball roll ramp	✓ for fields requiring FIFA certification	
If required, suitable secure storage container for the maintenance equipment	✓	✓

## 2 AUTOMATED PITCH USAGE MONITORING

To help maximise the life and performance of the pitch and to allow the field operator to track usage and maintenance, the Framework Supplier shall supply and install a fully automated pitch usage monitoring system. The system shall monitor on-field activity and calculate the Equivalent Playing Hours Usage. It shall also notify the field operator when the pitch reaches a defined milestone, indicating maintenance is required.

The type of Automated Pitch Usage Monitoring System to be used shall be approved by the FMC.

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The Framework Supplier shall allow in their pricing for the installation and commissioning of the system and the annual subscription / licensing fee, payable to the supplier, for the warranty period of the pitch.

Note: It is possible that during the period of the AGP Framework 2020 the Football Foundation may decide to have one or more nominate suppliers of Automated Pitch Usage Monitoring System. In this eventuality, the Framework Supplier shall undertake all necessary works to facilitate the supply and installation of the Automated Pitch Usage Monitoring System.

### **3 Maintenance training**

The Framework Supplier shall provide a fully detailed maintenance manual and all necessary training of the field operators to allow them to undertake all regular/routine maintenance of the surface.

In addition, the Framework Supplier shall provide details of all periodic maintenance (de-compaction, deep grooming, etc.) that will be required and provide a quotation for undertaking this work from the end of defect liability period onwards through the warranty period.

### **4 Maintenance records**

The Framework Supplier shall provide an on-line maintenance log to allow all maintenance activities undertaken by the field operator to be recorded.

### **5 Periodic maintenance – initial 12 months**

During the first 12 month of use, the Framework Supplier shall undertake all necessary periodic maintenance as required by the playing surface, considering the levels of use the pitch is being subjected to. The frequency of site visits shall be no greater than once every two months (eight weeks).

### **6 Initial infill top-up**

Between three and six months following handover of all football and rugby pitches the Framework Supplier shall undertake a top dressing of the pitch to compensate for any initial settlement and compaction of infill.

### **7 Carpet joint inspection**

Between three- and six-months following handover the Framework Supplier shall inspect all carpet joints (including inlaid lines) to ensure no localised failures have occurred. Any failures found shall be repaired.

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**8 Biannual maintenance / pitch inspections**

From the end of defect liability period onwards through the warranty period the Framework Supplier shall visit and inspect the pitch at least every six months. They shall assess the suitability and levels of maintenance being undertaken and provide a written report to the field operator advising if the maintenance being undertaken is adequate for the use and current condition of the playing surface. If defects or deficiencies are noted the Framework Supplier shall follow-up with the field operator to ensure suitable corrective actions are taken.

If failures in maintenance are not identified and notified to the field operator, they may not be used by the Framework Supplier as a justification to reject any subsequent warranty claim occurring in the event of a performance or materials failure.