



Indoor Sports Halls
with Cricket Provision
[TS3]



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01 Methodology



ECB selected a panel of consultants experienced in the design and testing of cricket facilities, or their component parts. The panel comprised;

Bruce Cruse

ECB Facilities and Funding Manager

Develops and administers grass roots designs and programmes within ECB's remit and its capital expenditure.

Peter L K Dury

ECB NTP Consultant

Former County Playing Fields Officer Nottinghamshire County Council, involved in the provision of cricket facilities for over 40 year and is the innovator and developer of a number of NTP systems

Alastair Cox

Labosport Ltd

Independent test laboratory specialising in the testing of sports surfaces. Member of British and European Standardisation Committees responsible for standards for sports surfaces.

Andrew Mytom

David Morley Architects

Designers of multipurpose sports halls and centres of excellence for cricket

Rupert Lodge

Max Fordham LLP

Mechanical and Electrical Designers of multipurpose sports halls with cricket provision and cricket specific centres of excellence and design contributor to Sport England's Optimum Sports Hall

Kevin Ibson and Troy Heptinstall

Continental Sports Ltd

Leading UK manufacturer, supplier and installer of sports equipment, changing room furniture and sports flooring

Current guidelines published by Sport England and the ECB were reviewed, separated into subject headings, and categorised by the following criteria:

- No ECB standard
- ECB standard consistent with Sport England guidelines
- Conflicting standards

Each item was discussed by the panel and the way forwards agreed.

02 Introduction



The England and Wales Cricket Board are charged with implementing a strategy across all forms and levels of the game.

Central to this is the provision of high quality locally available indoor practice facilities. As the game seeks to complement a Long Term Athlete Development (LTAD) pathway the access to facilities all year around for technical training is critical.

For its part Sport England fully supports the ECB Whole Sport Plan and acts as a primary consultant on design and sports facilities within the education sector. Readers of this guidance should feel free to contact either organisation for further assistance.

A number of issues need to be considered when designing Indoor Sports Halls with Cricket Provision, including;

- Space - establish if Cricket is the primary sport
- Netting - an essential component for the safe practice of indoor cricket
- Lighting - cricket requires specific lighting levels
- Surface - some require modification for Cricket
- Maintenance - an early awareness of maintenance regimes of components
- Budget - must reflect the requirements of the primary sport throughout the life of the facility

There are many detailed aspects that need to be addressed in addition to those listed. No single set of requirements are applicable to all projects. A number of factors need to be established and balanced.

This guidance note provides practical advice for clients and designers.

03 Key Dimensions & Requirements

The required length of hall (measured internally) is 33.62m.* The overall width is determined by the number of net bays and other factors specific to individual projects.

Sports Hall

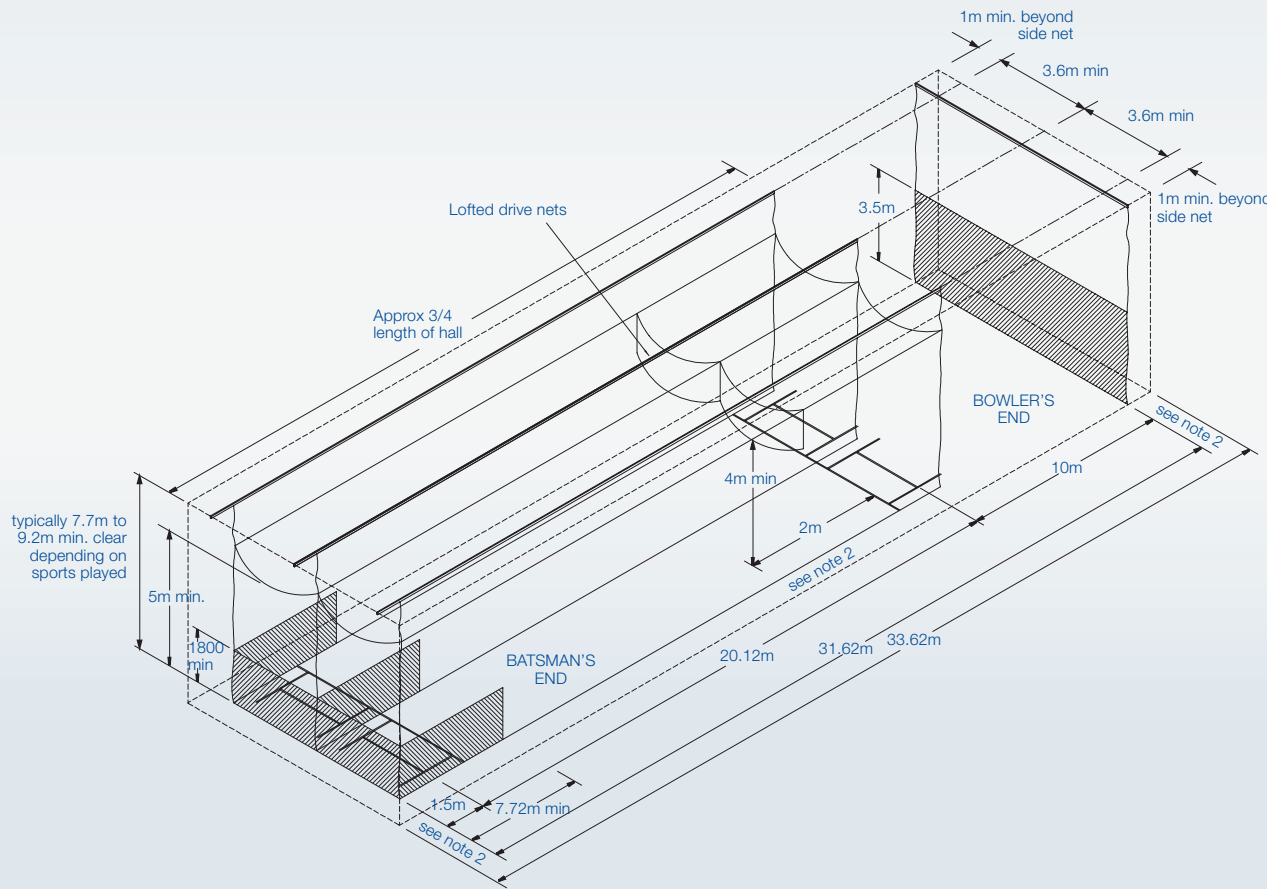
Length of Hall (internal)	33.62m
Net Lane Width	3.6m per lane
Safety Margin (surrounds)	1m minimum (variable)
Height of Horizontal top net	5m (a clear minimum)
Height to underside of loft net	4m minimum Bowlers run-up & delivery area length 16m (6m behind the bowling crease and 4m in front)
Space behind stumps	1.5m
Blinkers	7.72m from the back netting (5m in front of popping crease)

Roll-out Mats (if required)

Batting ends	length 11.22m (10m in front of popping crease) by 2m wide
Bowling ends	length 10m (6m behind bowling crease, 4m in front) by 2m wide

*Design note: ECB's recommended optimum length is 33.62m. If the length of the sports hall is less than 33.62m ECB will accept any shortened length down to a minimum of 31.2m. Reductions in length may only be made and calculated from the run up end.

03 Key Dimensions & Requirements

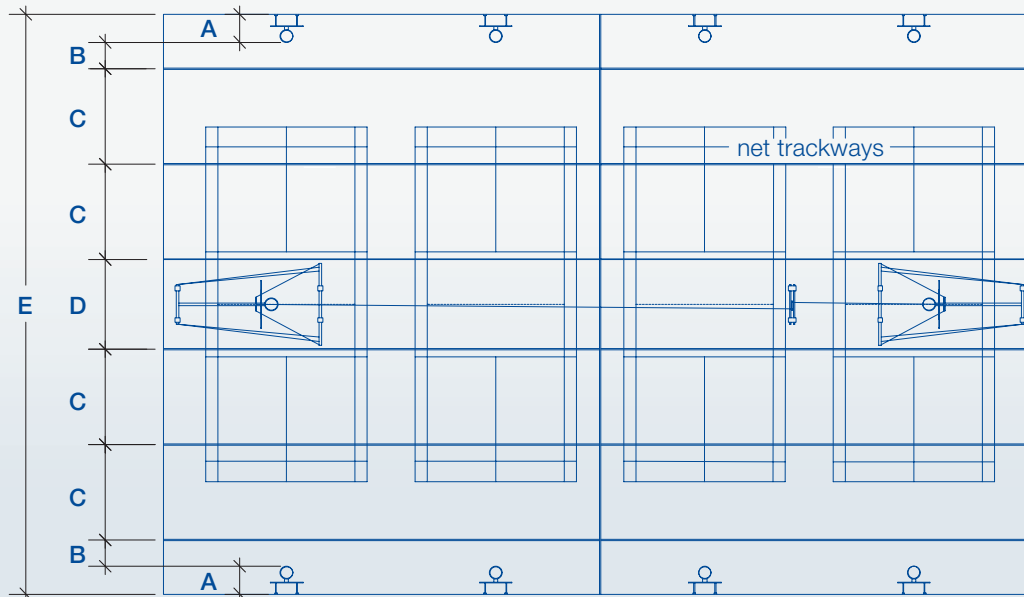


NOTES

1. Use of alternative dimensions for the overall length of cricket halls is subject to agreement by the ECB on a project by project basis.
2. Margins are to be at least 1m from adjacent walls up to a height of approximately 2m. Above this height margins are to be not less than 0.5m to reduce the risk of balls striking equipment such as basketball goal hoops. It should be noted that where equipment is fixed to walls margins are likely to exceed 1m at ground level. Consideration should be given to equipment selection as suppliers may be able to offer items that fold or retract towards the wall. Margins are also determined by circulation / escape requirements. Designers should liaise with Building Control / Approved Inspectors and Fire Officers at an early stage.

03 Key Dimensions & Requirements

Hall Width Calculator



A Practice basketball goals project varying distances depending on whether they are fixed or hinged. When closed hinged models project approximately 0.9m (check with equipment manufacturer before finalising dimensions).

B Recommended dimension of not less than 0.5m to reduce the risk of balls striking equipment such as basketball goal hoops and deflecting on to players.

Where basketball goals are not present A+B must not be less than 1m. A+B will also be determined by circulation / escape requirements. Designers should liaise with Building Control / Approved INspectors and Fire Officers at an early stage.

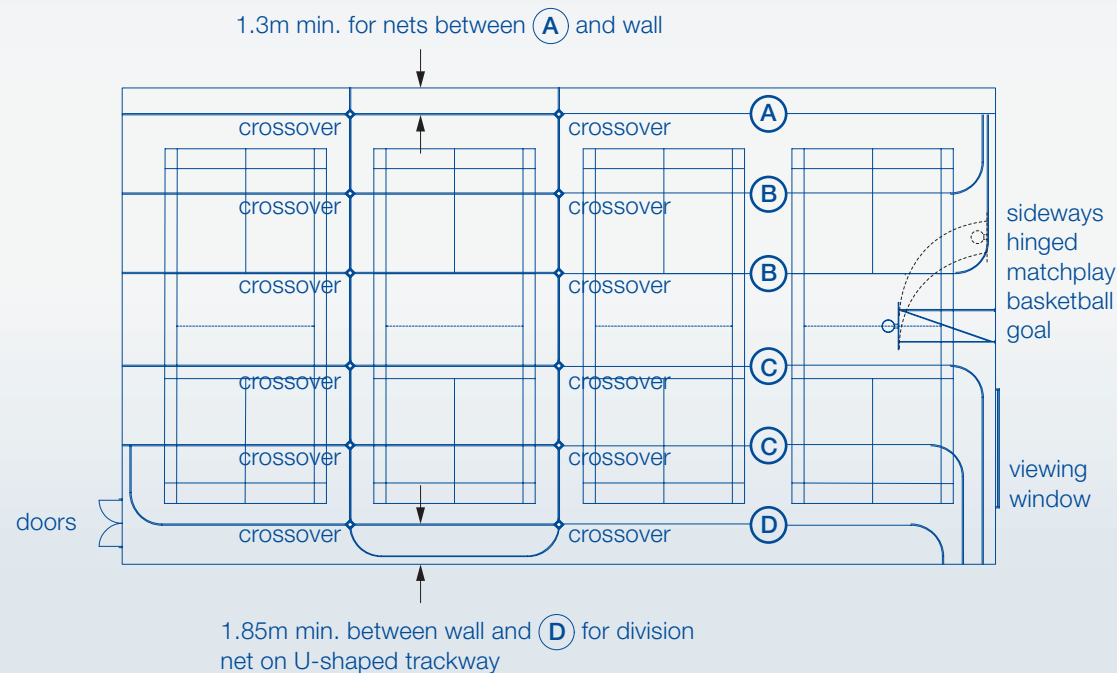
C Cricket bay widths 3.6m min. (4.0m elite).

D Roof retractable basketball goals requires 3.4m. Wall hinged basketball goals requires 2.0m (check with equipment manufacturer before finalising dimensions).

E Total width of hall.

03 Key Dimensions & Requirements

Use of Curved Tracks to Avoid Clashes Between Nets and Doors / Viewing Windows / Sports Equipment etc.



Tracks A - Do not need any curves.

Tracks B - Require curves to avoid the sideways hinged matchplay basketball goals. Curves are not required if roof retractable goals are installed.

Tracks C - Require curves to avoid the viewing window.

Tracks D - Require curves to avoid the viewing window and doors.

04 Netting, Blinkers, Screening, Tracking and Fittings

The net system used shall conform to the requirements indicated in this document and the latest edition of:
- BS EN 1892 Gymnasium Equipment Part 2. Particular Requirements Section 2.11. Specification for practice and games netting and supporting tracking.

This section is divided into Performance requirements, and Guidance.

Performance

The structure of the net system nets, blinkers, screening, tracking and fittings should be able to withstand cricket balls hitting the net and supporting structures when subjected to normal use. Balls should not pass under, over, through or between the nets, screening etc. Horizontal nets should be attached to vertical nets and balls should not pass between them. Balls should not become entrapped in the net system during normal use.

The netting should withstand balls impacting it, and players running into it.

Components should be UV resistant and not degrade or weaken as a result of exposure to sunlight.

The tracking holding the netting should not be damaged by cricket balls impacting it or players colliding with it.

Guidance

The individual net bay is separated from the adjoining bays by tracked side netting extended from end to end. The most efficient method is independent overhead tracks, which allows nets to be drawn independently and which allows for flexible usage.

It is recommended that nets be suspended from a heavy-duty aluminium tracking and trolley system which conforms to BS EN 1892. This type of system requires an independent overhead net, below which the tracking system is fixed; there should be no space between the roof netting and the tracking system through which a ball can pass into adjacent nets.

It is recommended that white polymer netting be used for the roof netting and it be either sewn or roof fitted with, 50 mm knot (knot to knot) or 40 mm knotless (weld to weld) square mesh, with the leading edges taped for reinforcement.

If the roof net is fixed to the side net the side net cannot be drawn independently and whilst this style of arrangement may be appropriate if the tracking has to be fitted to the roof joists well above the normal height requirements for roof netting it should otherwise be avoided.

The side netting should be long enough for at least 0.3m and no more than 0.5m of slack/drape to rest on the floor. This creates added weight and prevents the net from billowing out when struck by the ball (a billow of no more than 1.3 metres should be achieved when in service) otherwise it will interfere with activities in adjacent nets and walkways forming a potential trip hazard.

04 Netting, Blinkers, Screening, Tracking and Fittings

It is recommended that 50 mm knotted or 40 mm knotless white polymer netting mesh be used.

All sports hall netting, canvas, storage pouches, etc should be made of fire retardant material in accordance with BS 5867 Part 2.

The netting shall not be hung too taut to prevent balls rebounding dangerously.

Blinkers should be fitted to all practice nets. (Either heavy white canvas or polymer). They should be suspended on lanyard cords threaded through the net (not fixed to the net as this will, overtime create sag) both side and rear nets around the batsman/wicket keeper. It is recommended that the blinkers extend 5m in front of the batsman 7.72m from the rear net, and to a height of at least 1.8m.

A blinker similar system is recommended for the back netting behind the bowler to create a good visual background and to reduce the risk of injury from balls being driven down the net bay.

It is recommended that the bowling end blinker be 3m high either as a Velcro attachment or sewn in to the netting.



04 Netting, Blinkers, Screening, Tracking and Fittings

All the definitions are not included in this document but may be found in other documents associated with cricket and British Standards.

Net System: a net system is a single unit from a performance point view.

Net Bulge (net billowing): the extent to which the nets move horizontally from the vertical when an object hits it.

Lacing Nets: the fastening of nets to each other, to supporting frames or structures with a lace threaded and wound through the nets.

Ties: the fastening of nets to each other, to supports, bars and other structures, with individual sections of cord, string, yarn etc.
Net Aperture: the size of the mesh making up the netting.

Drag: the amount of netting which lies on the floor subsequent to the fixing of the netting unit to the overhead tracking.

Selvedge: a continuous cord attached to the periphery of the net.

Drape: netting has a tendency to produce a curtain effect when suspended from tracking or a tension wire.

Meshes: a collection of apertures between the cords making up the net.

Net Stretch: increase in size and length of fibres making up the netting.

Fittings: cables and any other materials used to support the net system.

Screening: a solid curtain manufactured from fibres.

Blinkers: term used for screening.

Track: nets are attached to track by runners. This allows the nets to be drawn along the track.

Fixings: brackets, bolts, ties, etc that hold the net system together.

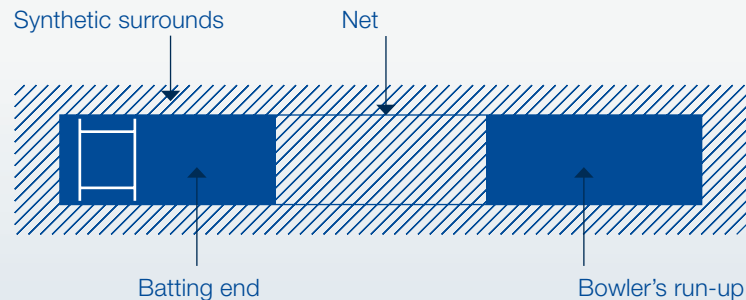
05 Playing Surface

To ensure surfaces with the playing and durability characteristics required by cricket are installed the ECB has developed a Performance Standard for Indoor Cricket Surfaces. It is based on BS EN 14904 Surfaces for sports areas - Indoor surfaces for multi-sports use - Specification, but includes properties specifically required by the game of cricket.

A cricket surface is a combination of the synthetic surfacing, together with its supporting layers (sub-structures) and the playing performance will be influenced by both. Before making a choice of surface, it is recommended you obtain test results showing compliance with the ECB Standard and detailing the performance of various products under consideration.

A cricket surface comprises two principal playing areas, a batting end and a bowling end. These are located within synthetic surrounds. The batting area measures a minimum of 10m in length in front of the popping crease with 1.22 metres between the stumps and the popping crease and a minimum of 1.5m behind the wicket (stumps). The Bowling end is an area measuring a minimum of 4m in length in front of the bowler's crease and a minimum 6m behind the bowler's crease on which the bowler runs and delivers the ball. The synthetic surrounds are located around and between the batting and bowling ends.

Figure 1 - areas of surface forming the playing area (colours and hatching for illustration only)



The surfacing laid in a multi-sport hall in which cricket is played may be continuous sports floor that has the required playing characteristics or roll out mats that, in conjunction with the sports hall floor on which it is laid, provide a suitable surface for cricket activities – it is important to note that a roll out mat found to be suitable on one

Left: The marking demonstrate the position of the batting crease, see markings under 03 Key Dimensions & Requirements.

Markings shall be accordance with the Rules of the Game and any special requirements for coaching, training etc.

05 Playing Surface



type of sports hall will not necessarily provide satisfactory performance on a different type of sports hall floor.

In dedicated cricket halls specialist cricket surfaces may be used that have different underlay constructions for the batting and bowling areas. The surface should allow repair without significant effect on its playing characteristics.

The flooring may be a combination of polymer sheeting or carpet, laid on a concrete or bitumen macadam base. By incorporating an under-layer the characteristics of the surface can be varied.

If roll out mats are to be used they should be firm with no significant cushioning, otherwise a combination of the sub-surface and mat may seriously affect the way the ball behaviours. If in doubt it is worth seeking specialist advice.

In the interests of safety roll out mats should be fixed to the floor when in use with double sided adhesive tape or an alternative material or method, unless they are heavy enough to prevent slip or movement on the sports hall floor.

Mat options for sports halls where cricket activities are to take place but the sports floor is unsuitable without some form of additional matting are detailed below.

- Roll out matting for batting ends (with crease markings)
- Roll out matting for bowling ends with crease markings.
- Additional spin mats if appropriate.
- Roll out match pitch 30 metres x 2 metres. (This facility is dependent on the overall size of the hall).

The supplier of the flooring system shall indicate and supply the materials to make the floor suitable for cricket.

Compliance testing after the floor is installed should be undertaken to ensure the correct qualities are achieved. In an increasingly litigious world, on-site testing and compliance with standards might be used in personal injury claims and compliance with ECB guidelines should be regarded as the minimum requirement to defend such a claim.

Operation and Maintenance Guidance:

Net Systems and Playing Surface.

The supplier/installer of the playing surface and netting systems shall provide details of the operation and maintenance of the system.

05 Playing Surface

Guidance should include how the system is used and the activities required to maintain it in good working order for the life of the installation. It should include: -

Netting:

- Maintaining the nets at the appropriate level of tension.
- Keeping them clean and free from dust
- Repairing damaged netting
- Preventing nets from becoming slack
- Preventing nets from sagging

Tracking, cables, fixings, fittings:

Maintaining the tracking, and if applicable cables, including: -

- Lubrication all movable parts
- Cleaning

- Removal of dirt to prevent a build-up

Surface:

- Cleaning
- Marking
- Removal of debris
- Application of colour coats (when required)
- Replacement sections (when required)

Any other maintenance work required to keep the facility operational at all times.

The desired frequency of operations should be indicated so that they form part of a regular maintenance schedule the user can refer to in order to manage and monitor the extent of the work required and make available the resources to do the work.



06 Internal and External Doors

Refer to current Sport England guidelines.

07 Internal Finishes (Colours)

Refer to current Sport England guidelines.

08 Flooring

Refer to Performance Standard for Indoor Cricket Surfaces. See page 22



09 Heating

Most multi purpose sports hall often require little heating and benefit from a system with a fast response time. There are two options available

Gas fired radiant with 2 branches with supply and extract fans in the end walls

Or

Ducted warm air delivering heated air through Air Handling Units (AHU) which should be indirect gas fired to reduce boiler capacity. Ideally this heating system should 100% recirculation with ventilation provided by other means

Heating System Controls

For both heating options, heating will be controlled by presence detectors and thermostat and ventilation by air quality

Heating Design Parameters

- Design Room temperature = 16 deg C
- Specialist Cricket Schools = 16 deg C to 20 deg C
- Sport England 'Optimum Sports hall' = 12 deg C to 20 deg C

10 Ventilation

High ventilation rates will be needed for a sports hall, but heating large quantities of outside air is energy intensive. Consequently, the strategy should seek to decouple the heating and the ventilation so that the spaces may be maintained at comfortable temperatures ready for use, with ventilation linked to occupancy. If ventilation rates are coupled to air quality control, then fresh air is provided only at the required rate, saving fan power and heating energy.

Low levels of fresh air can be provided passively through motorised dampers at high level, while additional ventilation could be provided by fans at high level which also provide large volumes of fresh air in summer to cool the space.

A properly designed multi-purpose sports hall, which meets the ventilation requirements for other sports (basketball, badminton etc), should be adequate for cricket practice without further modification.

Ventilation Design Parameters:
Design ventilation rate 1.5 Air changes per hour (ACHR)



11 Lighting

Indoor cricket schools should be illuminated using natural daylight. However, such an approach does require careful shading design to ensure that direct sunlight is excluded from the playing area at all times.

Sports halls with rooflights and glazing located in end walls may need suitable blinds/shades installed to exclude sunlight from the playing area – particularly low sun at particular times of the day and year. Consequently, the design of the shading for cricket practice will need to be assessed on a case by case basis.

Artificial Lighting

In multi-purpose sports halls lighting should use fluorescent light fittings with multiple lamps, which reduces glare and maintains uniformity at different illumination levels. The required light level should be provided by lines of fluorescent light fittings running alongside each wicket and fixed to the structure. Some assessment and coordination of the locations of the existing sports hall lighting, heating system (e.g. radiant tubes etc), net tracks and the wicket will be necessary. Consequently, the design of the lighting for cricket practice will need to be assessed on a case by case basis.

Wall Reflectance

For cricket practice, light wall colours are preferred. Ideally, a reflectance of 0.7 should be achieved with white painted walls, soffit/ceiling so as to provide adequate contrast with and improved visibility of the ball.

Some multi-purpose sports halls may be finished in other, darker, colours and it may be necessary to use a different coloured ball. Darker wall and ceiling colours also have a lower reflectance than lighter colours which must be taken into account when designing the cricket practice area lighting.

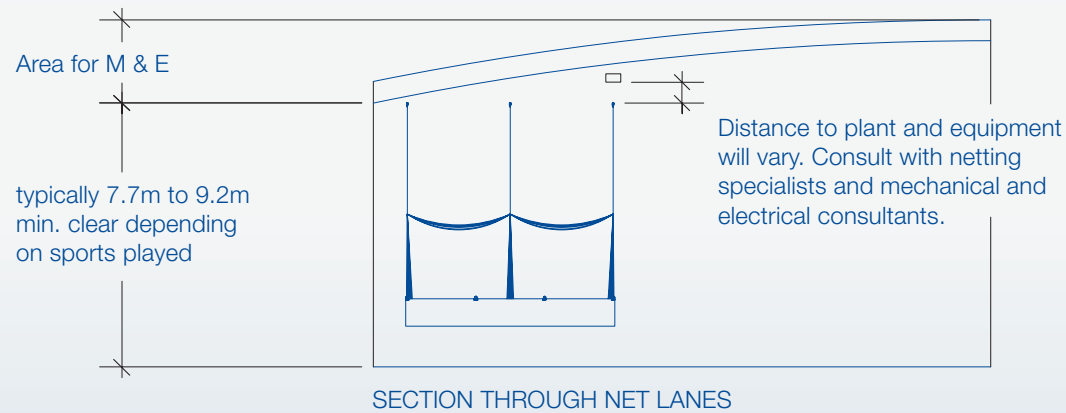
Lighting Design Parameters

These are the lighting levels, measured at pitch level, required over the practice net/playing area (Wicket and run up):

- Low-level Club/Local Club
Design illumination: 750 lux average
Design uniformity: min/ave = 0.8
- Mid-Level Competition.
Regional/Club level
Design illumination: 1000 lux average
Design uniformity: min/ave = 0.8
- Top-Level Competition.
International/National level
Design illumination: 1500 lux average
Design uniformity: min/ave = 0.8

11 Lighting

Mechanical & Electrical Consideration



Consideration must be given to space required for the safe installation, operation and maintenance of mechanical and electrical plant and equipment, and nets. Specialist advice should always be sought prior to fixing overall dimensions, in particular with regard to distances between radiant gas heaters and net systems.

12 Indoor cricket for disabled people

ECB advises that players with many different types of impairments enjoy the game on a regular basis. Players who use a wheelchair are just as likely to use indoor facilities in the same way that a mainstream cricketer would do so. Matches will be played using the full hall and net lanes will also be used for

practice by players using wheelchairs. There is no need for any specific design alteration to accommodate wheelchair players.

13 Lifts

ECB guide to refer to current Sport England guidelines.

14 Lockers

Cricketers require space to store personal cricket equipment (usually 'soft bags) and valuable outside the changing rooms. Ideally this should be within, or adjacent, to the main hall and within sight of the players/coaches. Refer to Sport England guides for lockers.



15 Cricket specific storage

Storage of cricket specific equipment (Mats, bowling machines and floor cleaners etc) will be required separately.

16 Spectator Seating / social areas

ECB guide to note that spectators should be outside of the playing hall, ideally be behind the bowlers arm and at an elevated level to assist viewing. Spectators must be protected from ball impact

17 Reception areas

ECB to refer to Sport England guidance. Note to be added that sufficient space is needed for 35 players with parents on hourly rotations outside of the practice area.





Performance standards for indoor cricket surfaces

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01 Introduction and Scope

This Standard describes the requirements for synthetic surfaces designed for indoor cricket. It is based on *BS EN 14904 Surfaces for sports areas – Indoor surfaces for multi-sports use – Specification*, but includes properties specifically required by the game of cricket.

The Standard covers three types of sports hall flooring systems:

- sports hall flooring designed to be laid as a continuous system throughout a sports hall allowing a range of sports, including cricket, to be played(1). Continuous systems are required to satisfy the performance requirements of batting and bowling ends;
- specialist cricket surfaces used in dedicated cricket halls with different underlay constructions for the batting and bowling areas. Each section of the surfacing shall satisfy the relevant performance requirements for ends on which it is intended to be laid;
- roll out mats that, in conjunction with the sports hall floor on which they are laid, are designed to provide a suitable surface for cricket training activities. In such cases the ball/surface and player/surface interaction of the mat shall be assessed in conjunction with the floor on which it is designed to be laid (2). The batting ends of mats are required to satisfy the performance requirements for batting ends and the bowling ends are required to satisfy the performance requirements for bowling ends.

- (1) This Standard only addresses the needs of the game of cricket. The suitability of a floor meeting this standard for other sports needs to be determined by the organisation proposing to install the floor.
- (2) A roll out mat found to be suitable on one type of sports hall will not necessarily provide satisfactory performance on a different type of sports hall floor.

02 Normative References

Test methods from other publications are incorporated into this Standard by dated or undated reference. Where dated references are used, subsequent amendments to or revisions of any of these publications will apply to this Standard only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

03 Definitions

03.1 Playing surface

An area of synthetic surfacing, together with its supporting layers, that is used for cricket. The area comprises two principal playing areas, a batting end and a bowling end. These are located within synthetic surrounds.

03.2 Batting end

An area measuring a minimum of 10m in length in front of the popping crease and a minimum of 1.5m behind the wicket (stumps) on which the batsman stands and the ball pitches when bowled.

03.3 Bowling end

An area measuring a minimum of 4m in length in front of the bowler's crease and a minimum 6m behind the bowler's crease on which the bowler runs and delivers the ball.

03.4 Synthetic surrounds

The areas located around and between the batting and bowling ends.

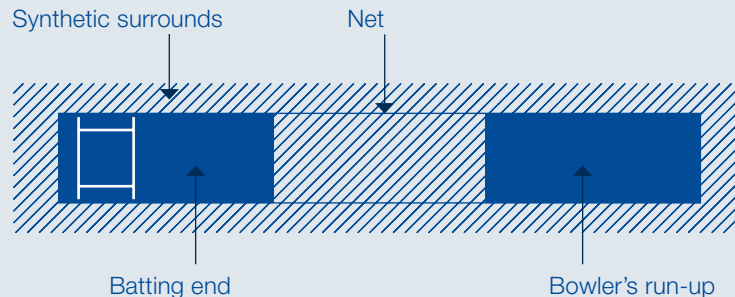


Figure 1 - areas of surface forming the playing area (colours and hatching for illustration only)

03.5 Point-elastic sports floor

Sports floor, to which the application of a point force causes deflection only at or close to the point of application of the force.

03.6 Area-elastic sports floor

Sports floor, to which the application of a point force causes deflection over a relatively large area around the point of application of the force

03.7 Combined-elastic sports floor

Area-elastic sports floor with a point-elastic top layer, to which the application of a point force causes both localised deflection and deflection over a wider area

03.8 Mixed-elastic sports floor

Point-elastic sports floor with a synthetic area-stiffening component

04 Classification

Surfaces are classified by their intended use and performance characteristics and not by materials or construction. There are two principal categories:

1. Club and Educational
2. First Class Cricket & Centres of Excellence

Both of which may be used for practice, coaching and general training.

05 Performance Requirements

05.1 Ball / surface interaction

05.1.1 Ball rebound

Ball rebound shall be measured from a drop height of 2000mm + 10mm in general accordance with BS EN 12235 using a cricket ball complying with BS 5993 and having a rebound on a rigid concrete floor of 640mm + 30mm. The rebound shall be expressed as the absolute rebound in mm.

For area-elastic and combined-elastic sports surfaces, the test piece shall be a sample of the complete system measuring 3.5 m by 3.5 m, assembled in accordance manufacturer's stated method, with the manufacturer's requirements. For point-elastic and mixed-elastic sports surfaces, the test piece shall be a piece of the surface of minimum size 1.0 m by 1.0 m, in combination with the supporting layers to be used in service and using the method of attachment in accordance with the manufacturer's instructions.

Note: a Reader Grade 1 County Ball has been found to satisfy these requirements.

The ball rebound of batting ends shall satisfy the requirements of Table 1.

Table 1 - Ball rebound requirements	
Club / Educational	Centre of Excellence & First Class Cricket
240mm – 520mm	320mm – 560mm

Installed surfaces shall be tested in the positions shown in Appendix A. Laboratory tests shall be made in similar positions proportioned to suit the test piece size.

All test positions shall fall within the specified range. The maximum individual result at any test position shall be no more than 1.5 times the minimum individual result at the test position.

The overall mean for all test positions shall be calculated. The variation from the overall mean of any test position shall be no greater than + 50mm of the overall mean.

05.1.2 Surface pace

The pace of some forms of indoor sports hall flooring may be considered too fast for indoor cricket. At present there is no suitable test for assessing the pace of a cricket surface so limits of acceptability cannot be set. The ECB wish to rectify this and has commissioned research to develop a test and establish limits of acceptability based on natural grass cricket pitches. It is hoped this work will be completed by the end of 2008, at which point this standard will be updated. In the mean time facility operators are advised to seek specialist guidance on whether the pace of indoor surfaces they are considering is suitable for their intended needs.

05.1.3 Surface hardness – batting ends

When tested by the method described in Appendix B the mean Clegg Impact Value (in g) for each test position on a batting end shall be greater than 100 gravities.

Installed surfaces shall be tested in the positions shown in Appendix A.

05 Performance Requirements

05.2 Player surface interaction

05.2.1 Shock absorption – bowler's run-up

When tested by the method described in BS EN 14808 the Force Reduction of bowling ends shall be between 25% and 55%. Installed surfaces shall be tested in the positions shown in Appendix A. No individual result shall differ from the mean of all the test areas by more than ± 5 units.

05.2.2 Vertical deformation – batting end, bowler's run-up and synthetic surrounds

When tested by the method described in BS EN 14809, the vertical deformation of batting and bowling ends shall not exceed 3.5mm.

05.2.3 Friction – batting ends, bowler's run-ups and synthetic surrounds

When tested by the method described in BS EN 13036-4 using the CEN rubber under dry conditions, the mean result shall be between 80 and 110.

When different forms of surfacing are used for the batting or bowling ends and synthetic surrounds the maximum difference between the slip resistance of two surfaces shall be four units.

06 Material Requirements

06.1 Resistance to wear

When tested by the method described in BS EN ISO 5470-1, using H18 wheels with a 1 kg load, the maximum loss in mass per 1 000 cycles of synthetic surfaces shall be 1 000 mg.

When tested by the method described in BS EN 13672 the percentage mass loss after 2000 cycles of synthetic turf and textile surfaces shall be equal to or less than 5%.

06.2 Resistance to a rolling load – continuous surfaces only

When tested by the method described in BS EN 1569, the minimum resistance of continuous surfaces shall be 1500 N, the maximum indentation shall be 0.5 mm under a 300 mm straight edge and no perceivable damage shall be observed after the test.

NOTE This property is important to ensure that continuous surfaces laid throughout a sports hall will not be damaged by equipment or seating that might be moved around on it.

06.3 Resistance to indentation

When tested by the method described in BS EN 1516, the mean residual indentation measured 5 min. after removal of the load shall be reported and the mean residual indentation measured 24 h after removal of the load shall be ≤ 0.5 mm. For area-elastic sports floors the test shall be made on the upper layer supported on a rigid structure only.

06.5 Specular gloss

When tested by the method described in ISO EN 2813 using an angle of incidence of 85° , the specular gloss shall be ≤ 30 for matt surfaces and ≤ 45 for lacquered surfaces.

06.6 Reaction to fire

If a claim for reaction to fire performance is made, the sports surface shall be tested and classified using the procedures specified in BS EN 14904.

If it is decided to make no claim for reaction to fire performance, i.e. it is decided to place a product on the market as Class Ffl, no testing is required.

06.7 Formaldehyde emission

When formaldehyde-containing materials have been added to the surface as a part of the production process, the product shall be tested and classified into one of two classes: E1 or E2, as specified in BS EN 14904.

06.8 Content of pentachlorophenol

The surfacing shall not contain pentachlorophenol or a derivative thereof as a component in the production process of the product or of its raw materials. In cases where verification is required the procedures described in BS EN 14904 shall be used.

07 Construction Requirements

07.1 Surface regularity – batting ends, bowler’s run-ups and synthetic surrounds

When tested by the method described in BS EN 13036-7 the maximum undulation shall not exceed 2 mm under 0.3 m straight edge and 6 mm under a 3 m straight edge.

07.2 Slope – batting ends, bowler’s run-ups and synthetic surrounds

Indoor cricket surfaces shall be installed flat.

08 Test Conditions

Laboratory tests shall be made at an ambient laboratory temperature of $23 \pm 2^{\circ}\text{C}$.

Test specimens shall be conditioned for a minimum of 3 hours at the laboratory temperature prior to test.

Tests on an installed floor shall be made when the ambient temperature of the sports hall is in the range 12°C to 25°C .

09 Test Laboratories

Tests for ECB approval shall only be made by ECB approved test laboratories.

Appendix A Site Tests

Tests shall be carried out in the positions detailed below or in the case of a dispute in the area of concern.

Property	Test location
Ball rebound	Five individual tests across the playing area in each test segment a to e as shown on Figure 1
Surface hardness (pitch of the ball area)	Segments a to e as shown on Figure 1
Slip resistance	Segments a, c and e as shown in Figure 1 and positions 1, 3 and 5 as shown in Figure 2
Shock absorption	Each position shown in Figure 2.
Deformation	Segments a, c and e as shown in Figure 1 and positions and 1, 3 and 5 as shown in Figure 2

The surface regularity of the playing surface and surrounds shall be measured over the entire area; both along the length and across the width. The position and magnitude of any undulations found that exceed the specified maximums shall be recorded and detailed in the test report.

Figure 1 – tests positions

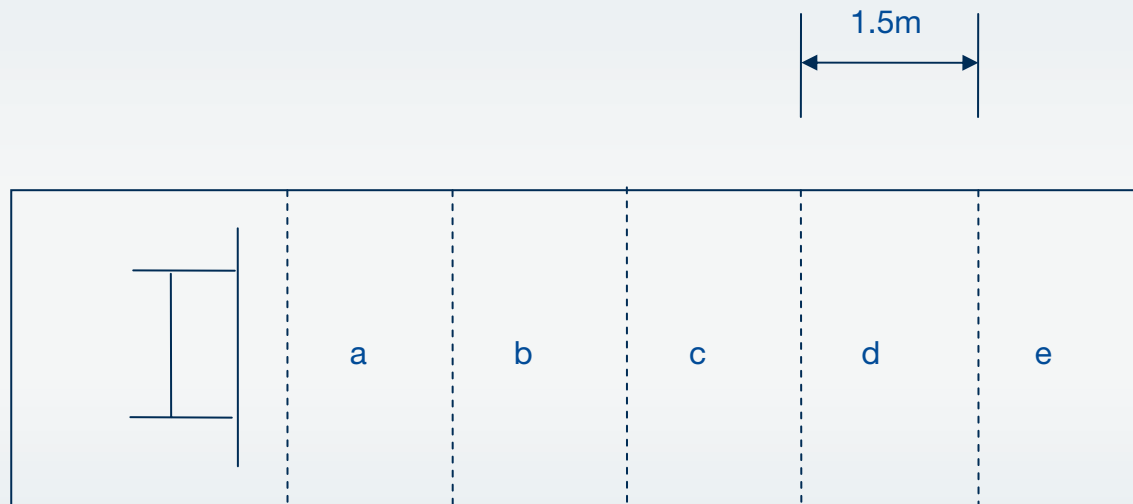
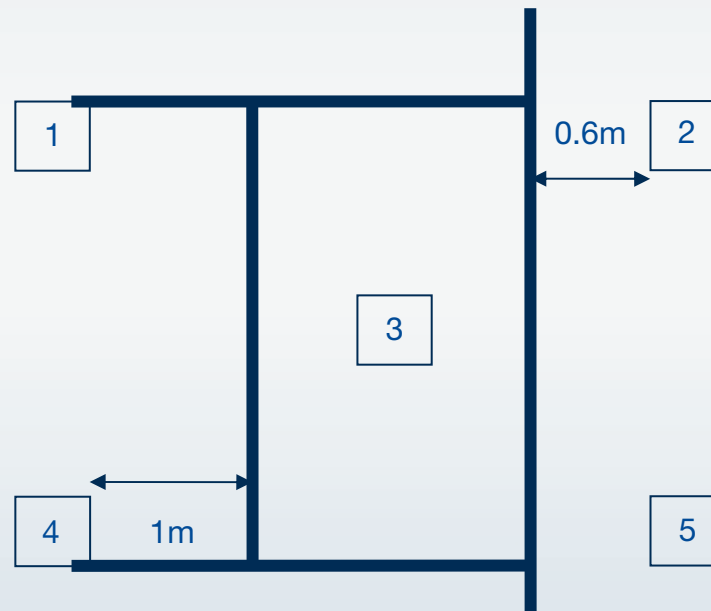


Figure 2 – tests positions



Appendix B Method of test for determination of surface hardness

1 Principle

A cylindrical mass is released from a standard height and its peak deceleration during impact with the surface is recorded.

2 Apparatus

A Clegg Impact Soil Tester shall be used. The apparatus consists of a cylindrical compaction hammer with a mass of 2.25kg and a diameter of 50mm attached to a piezoelectric accelerometer which feeds into a peak level digital meter. The peak deceleration of the hammer on impact with the ground shall be displayed in units of gravities.

3 Procedure

Ensure that the guide tube is held vertically and drop the compaction hammer down the tube from a height of 450+10mm. After the impact of the hammer on the surface record the peak deceleration in units of gravities.

Repeat the procedure five times in each test position moving the guide tube by at least 100mm so that the compaction hammer does not impact with the surface on the same spot twice.

4 Expression of Results

Calculate the mean hardness value of the five individual impacts for each test position.