SPORT ENGLAND

Design
Guidance Note

Creating sporting opportunities in every community

Sports Halls Design & Layouts

Updated & Combined Guidance

February Revision 005

Sports Halls

Design Guidance Note

Foreword

Sport England believes that good facilities are fundamental to developing sporting opportunities for everyone, from the youngest beginner to the international class athlete. The buildings whether large or small can encourage civic pride and assist the process of revitalising deprived neighbourhoods. Facilities that are well designed built to last and well maintained are a pleasure to use and give an ample return on the time and money invested in their construction and day to day use.

Good design needs to be based on a sound understanding of such issues as the current trends and practices within individual sports, the wider leisure industry and the lessons to be learnt from previously built schemes.

Good design needs to be embraced within the earliest vision statement for a particular project and enshrined in the initial briefing stage through to the final detailed specifications and operational arrangements.

To be read in conjunction with separate Sport England publication 'Developing the Right Sports Hall'.

Sport England's design guidance notes aim to:

- ***Increase awareness of good design in sports facilities***
- ***Help key building professions, clients, user representatives and other stakeholders to follow best practice***
- ***Encourage well designed sports facilities that meet the needs of sports and are a pleasure to use.***

Sport England design guidance notes aim to promote a greater general understanding of overall design concepts, an appreciation of technical issues and the critical factors that need to be considered in reaching the appropriate solution for a particular project. They also advise where further information, advice and expertise may be found and point to benchmark examples.

This interim update aligns with the new Sport England publication *'Developing the Right Sports Hall'* and the *'Sports Data Sheets'.*

Later in 2012, Sport England will be rehosting a fully updated revision of *'Sports Halls Design and Layouts'* design guidance note to encompass the latest round of developments and initiatives currently under discussion.

Sports Halls

Design Guidance Note

Contents

1.0 Introduction

General

This guidance note covers the design and planning of multi sports and specialist sports halls and their attendant accommodation. These halls can be in the form of a single 'stand alone' building with minimum support accommodation or as a component within a larger centre.

The building type can be traced back to the beginning of the last century. Some early examples being simple 'sports barns' on school sites that gave basic weather projection to outdoor playing areas. Others were part of larger community sports centres that were developed from the 1970's. Various development projects and programmes [1] in the 1980's saw the evolution of standard compact and cost effective designs. Further development work by Sport England led to the 'Optimum' sports hall concept as an economically sustainable 'off the peg' design package [2] for the new millennium.

Various built examples around the country provide an excellent range of benchmarks for well designed, efficient and attractive centres that use good quality materials and achieve a high degree of customer appeal.

Well designed SPORTS HALLS can accommodate an extensive range of school PE and sports activities that can benefit the whole community.

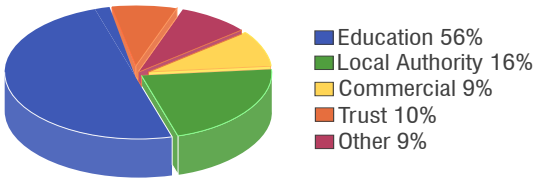
National statistics and trends

It is estimated [3] that there are over 4,500 multi-sport halls in England. This represents approximately 2.7million m^2 of floor space and the vast majority (83%) are small halls with 3-4 badminton courts. Almost half of the halls are operated on a pay and play basis (44%), whilst the remainder are split between membership / club and private use.

Nearly all sports halls in England were built in the second half of the twentieth century with one third being built since 1996 and half since 1986.

During the period 1940's – 1960's almost all new sports hall were built by the education sector. In the 1970's, Local Authority reorganisation triggered a significant increase of provision with a peak of 453 new sports halls being built between 1971 and 1975. From the mid 80's the number of local authority sports halls declined whilst the number of education sports halls increased up until the mid 1990's. Since then this trend has been reversed with an increase in the number of Local Authority halls and a decline in education owned halls despite the Building Schools for the Future (BSF) programme being an important contributor.

There has been a steady trend for the education sector to outsource the management of their sports halls as shown by the distribution diagram below:



England: Sports halls by management provider

Current challenges

With the potential for many secondary schools to have their physical education (PE) and sports provision updated, it is important to fully understand the value that flexible multi-sport indoor sports halls can offer. Stakeholders should be challenged to consider the future of teaching, learning and community participation and help to inspire future facility development [4].

This should include strategic planning for school and community sports facilities, and appropriate design specification for buildings and outside areas.

The investment in PE and school sport has never been so good; yet many of the various capital and revenue programmes supporting their development are developed in isolation.

There are significant variations and imbalances in the provision of sports halls within England and the extent that they meet local needs. For example, London, that has some 12.5% of the population of England, has 4% fewer sport halls than the average for the rest of the country.

See *Active Places* data base for the situation in a particular location.

http://www.activeplaces.com/

[1] Technical Unit for Sport Development Project at Tamworth followed by the Sport England Standard Approach to Sports Halls (SASH) design and building programme.

[2] Later updated to the Optimum Package.

[3] Active Places Data (January 2011) halls with 3 or more badminton courts.

[4] For the key design issues in designing for sport on school sites: http://www.partnershipsforschools.org.uk/documents/library/BSF-archive/PfS_Factsheet_DesignGuidance_PESport.pdf

Levels of play

The space requirements in sports halls should relate to the level of play categories for the particular activities. Generally, the higher the level of play, the more space that is required for the safety zones and other margins around the playing area. For many competition events, an extra zone is also required for team benches and officials' tables. An additional security zone between teams and spectators may also be required for major events. Adding these margins around the playing area produces the critical overall space – i.e. the minimum safe area for a particular level of play.

For some sports such as Badminton [5], Volleyball and trampoline the clear internal height above the court to any downward projection such as light fittings, roof mounted equipment and tracking for netting is also important.

Levels of play can be generally categorised as International, Premier, Club and Community [6] and an overview of what can be accommodated in various sizes of hall is shown on page 6.

International	This category relates to the lowest level of International play [7].
Premier	This category relates to a Premier / National League Club competing in regional or inter county competitions.
Club	This category relates to a local club competing in District and County League competitions.
Community	This category relates to school and community use where there is no formal competitive structure / no specific need for space for officials or spectator accommodation.

However, it should be noted that other categories and terms are used by a number of Sports Governing Bodies and sports promoters for particular events and programmes. For example:

Top divisions

Local league

Lower divisions

Sports Governing Bodies also have their own specifications and classification system for sport facilities.

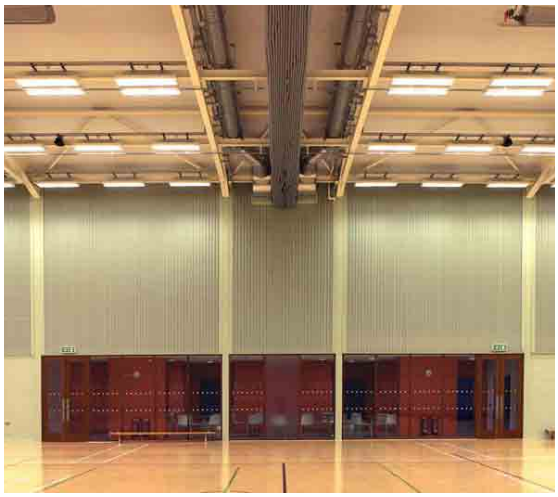
[5] See Sport England design guidance note *'Badminton'*.

[6] See Appendix 4 of Sport England publication *'Developing the Right Sports Hall'* for more information.

[7] For higher levels of international competition, such as major championships, the relevant NGB should be consulted at a very early stage as the requirements vary considerably.

See separate Sport England publications:

- ***'Developing the Right Sports Hall'***
- ***'Comparative Sizes of Sports Pitches and Courts'.***



Acoustic dividing screen integrated into the design

Adjustments of space requirements

Adjustments to the nominal sizes of sports halls may also be required for a number of business and programing reasons. In addition, there may be a range of technical issues in the detailed design and construction processes. These might include:

- Space for division nets / screens / barriers
- Space for addional viewing / spectators /officials
- Adjustment in position of court line marking to avoid conflicts
- Structural grid requirements
- Mechanical and electrical installations
- The support of fixed sports equipment on the walls and roof
- Location of light fittings in relationship to the court markings.

Early consideration of such factors will help to ensure a well integrated design solution and help to avoid compromise to the minimum safety requirements and the successful operation of the sports hall.

Modular approach to hall sizes

Badminton is often the sport which has the most influence over the design of sports halls. It is frequently a popular activity and has a convenient space requirement for adopting a modular approach to the sizing of halls. It can also influence a number of building elements such as the roof structure, lighting, background colours and air velocities. These issues are discussed in more detail in Sections 5 and 6.

A single badminton court space is regarded as the smallest practical multi-sport space. See Sport England design guidance note *'Community and Village Halls'.*

The number of Badminton courts is used as an easy reference for the size of a sports hall.

(i.e. 4 or 12 court hall)

See table on page 7 for nominal hall sizes and the range of sports that can be accommodated.

Two or three badminton court halls are also seen as valuable facilities, but a four court configuration is required for many sports that need to be played along the length of the space. However additional length and width is likely to be required to obtain the best value for money.

For school projects a minimum size of 34.5 x 20.0 x 7.5 m is recommended [8]***.***

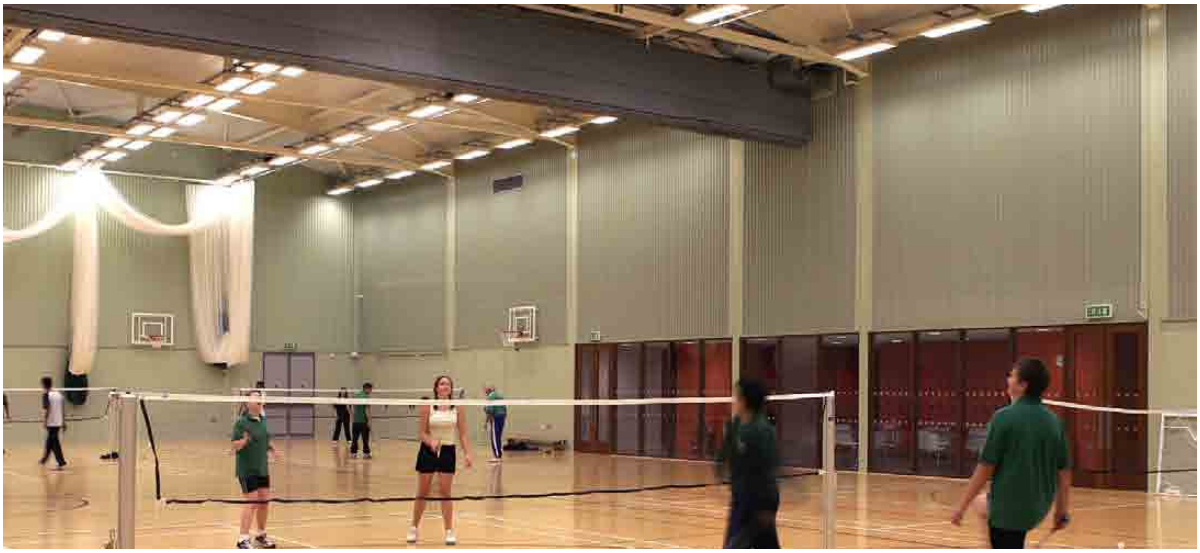
Specifications for multi-sport halls

A hall based on a 4 badminton court module can be successfully designed to accommodate a range of sports, but careful attention should be given to the proposed level of play category for each sport, the critical dimensions for the 'principal playing area' and 'run off' spaces and the choice of sports floor.

The Sport England publication *'Developing the Right Sports Hall'* sets out a 7 step process that includes decisions about establishing which sports are considered as 'priority' and 'secondary' within a hall. In multi-sports projects, the individual spatial requirements of sports such as netball, handball, hockey and korfball that exceed the minimum requirements for 4 badminton courts are critical - extra space will be required both on the width and the length.

This has led to the updated 4 court hall module with nominal dimensions of 34.5 x 20.0 x 7.5 m and a larger 5 court hall module with nominal dimensions of 40.6 x 21.35 x 7.5 m being the minimum sizes for multi-sport projects, depending on the range of sports to be accommodated. See the table on page 7 for the sports, level of play categories and court numbers that can be accommodated within a range of typical nominal hall sizes based on these modules.

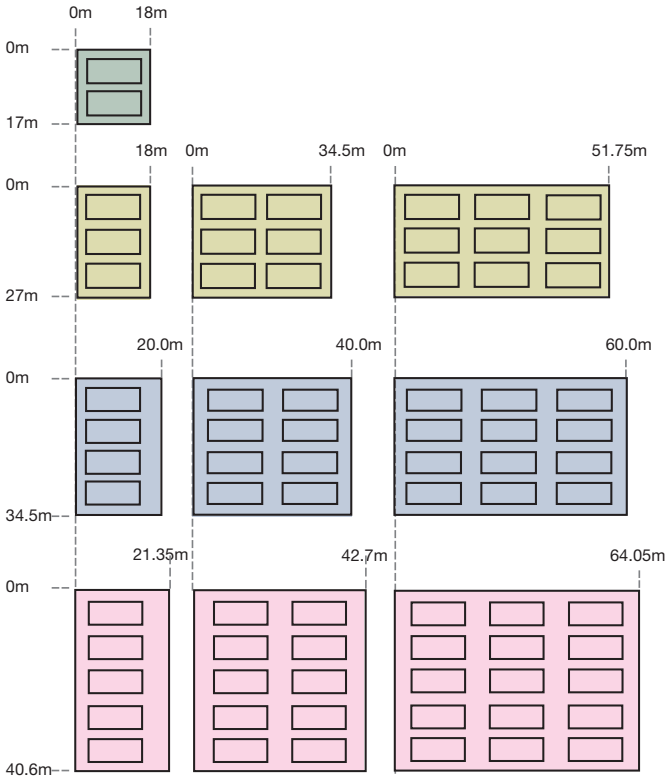
[8] In the past, Building Bulletin 98 referred to a minimum size of 18 x 33 x 7.6m. This size is now considered by Sport England and the NGBs to be unsuitable as it does not allow the recommended court sizes and limits teaching / coaching and flexibility of use.



Acoustic dividing screen at the centre point of a 6-court hall on a school site allows the space to be divided into two teaching spaces

The 4 and 5 court halls provide additional space for teaching school PE and coaching

(particularly when the hall is sub-divided into two sections).



Modular sports hall approach

The updated sizes for the 4 and 5 badminton court modules give advantages for the individual sports which include:

Volleyball

- *2 training courts that can be separated by netting*
- *Space on side for officials tables for central court*

Basketball

- *Space for safety zones to NGB's standards*
- *Space on side for official's tables*

Netball

- *Space for increased size of court and safety zones (but still less than NGB recommendation unless the width is increased to 21.35 m)*

Handball

- *Additional length for court (1m short)**

Cricket

- *Additional length for bowlers run up end*

Others

- *Added general flexibility for teaching nets.*

See pages 38 - 41 for details.

**** if Handball is a priority then additional length would be recommended.***

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Overview of numbers of courts* / levels of play for nominal hall sizes

Sport and level of play category**	4 Court hall (34.5 x 20.0 x 7.5 m)	5 Court hall (40.6 x 21.35 x 7.5 m)	8 Court hall (40.0 x 34.5 x 8.3 m)	10 Court hall (40.6 x 42.7 x 9.0 m)	12 Court hall (60.0 x 34.5 x 9.0 m)	15 Court hall (64.05 x 40.6 x 9.0 m)	General notes: • Unless noted otherwise all sizes include for team / officials zones but **DO NOT** include for any spectator provision. • The number of courts noted for each hall size does not take into account the additional option of inclusion of 'Show Court' overlays.
Badminton (with 1 dividing net per 4 or 5 court module)							
International [1]	4^{2+3}	4^{2}	8^{2}	8	12	12	[1] Excludes officials zone. [2] Requires a clear height of 9.0 m. [3] It is assumed that division nets are excluded.
Premier [1]	4^{2}	5^{2}	8^{2}	10	12	15	
Club [1]	4	5	8	10	12	15	
Community [1]	4	5	8	10	12	15	
Basketball							
International	-	-	1	1	2	2	
Premier	-	-	1	1	2	2	
Club	1	1	2	2	3	3	
Community [4]	1	1	2	2	3	3	[4] Excludes team / officials zone.
Reduced court size [5]	2	2	4	4	6	6	[5] Excludes team / officials zone.
Cricket practice / Indoor cricket							
Community [6]	4	4	8	8	12	12	[6] Includes allowance for a central 3.4 m wide (minimum) clear zone for basketball goals within each 4 or 5 court module.
Gymnastics							
International	-	-	-	O	P	P	The new hall sizes provide more space for all the gymnastics disciplines.
Premier	P	P	1	1/2P	1/3P	1/3P	
Club	P	1	1	1/2P	1/3P	1/3P	
Community	1	1	2	2	3	3	
Five-a-side football / Futsal							
International	-	-	P	P	1	1	The new hall sizes provide more space for Five-a-side football / Futsal.
Premier	P	P	1	1	3	3	
Club	1	1	2	2	3	3	
Community	1	1	2	2	3	3	
Handball							
International	-	-	-	1	1	1	The new hall sizes provide more space for Handball.
Premier	-	1	1	2	1	3	
Club	-	1	1	2	1	3	
Community	1	1	2	2	3	3	
Indoor hockey							
International	-	-	-	1	1	1	The new hall sizes provide more space for Indoor Hockey.
Premier	-	P	P	1	1	1	
Club	-	P	P	1	1	1	
Community	1 Unihoc	1 Unihoc	1 Unihoc	2	1	2	
Korfball							
International	-	-	-	-	1	1	The new hall sizes provide more space for Korfball.
Premier	-	-	1	1	1	2	
Club	-	-	1	1	1	2	
Community	1	1	2	2	3	3	
Netball							
International [7/8]	0	0	1	1	1	1	[7] A practice area will be required close to the international competition court. [8] For International and Super League consult with England Netball on space required for tv equipment and anticipated club specific spectator requirements.
Premier	0	1^{9}	1	2^{9}	1	3^{10}	[9] The hall / module width needs to be increased to 23.35 m to allow for a 2.0 m wide team / officials zone which cannot be accommodated in the standard size hall. [10] Excludes team / officials zone which must be accommodated by increasing the hall size and/or by sharing team/official zones between multiple courts. [11] Where netball is not the primary sport, by agreement, England Netball will allow club netball to be played in this size hall, with reduced run-offs and no team and official zones.
Club	1^{11}	1^{9}	2^{10}	2^{9}	3^{11}	3^{10}	
Community	1	1	2	2	3	3	
Sports hall athletics							
International	-	-	-	P	1P	1P	The new hall sizes provide more space for all the athletics disciplines.
Premier	P	P	2P	2P	3P	3P	
Club	P	P	2P	2P	3P	3P	
Community	P	P	2P	2P	3P	3P	
Volleyball							
International	0	0	1	1	2	2	
Premier	1	1	2	2	3	3	
Club	1	1	2	2	3	3	
Community [4]	1	1	2	2	3	3	[4] Excludes team / officials zone.
Training courts [4]	2P	2P	4P	4P	6P	6P	[4] Excludes team / officials zone.

* Indicative court numbers are an update of the previous revision and should be checked against the space requirements for the individual sports to be accommodated.

** See Appendix 4 of '*Developing the Right Sports Hall*' for guidance on the level of play category for each sport.

*** P = Below space standard for competition play recommended by the governing body, but suitable for practice and training.

Range of sports and local need

The local need for each sports hall project, for both new and refurbishment schemes, may vary considerably and needs to be established before any designs are developed. Sport England and the NGBs have worked together to produce a standard methodology for all sports hall projects to enable a clear vision and project brief to be established. Detailed guidance on the methodology and who can help is available in Sport England's publication *'Developing the Right Sports Hall'*. A summary of the 7 steps in the methodology is set out below.

Decisions on the size of the sports hall and support accommodation should be based on:

1. **SUPPLY AND DEMAND ISSUES**
2. **STRATEGIC CONSIDERATIONS**
3. **TYPE OF ACTIVITY / LEVEL OF PLAY CATEGORY**
4. **HOW MUCH USE**
5. **DEVELOPING THE PROJECT BRIEF**
6. **THE BUSINESS CASE**
7. **THE DECISION**

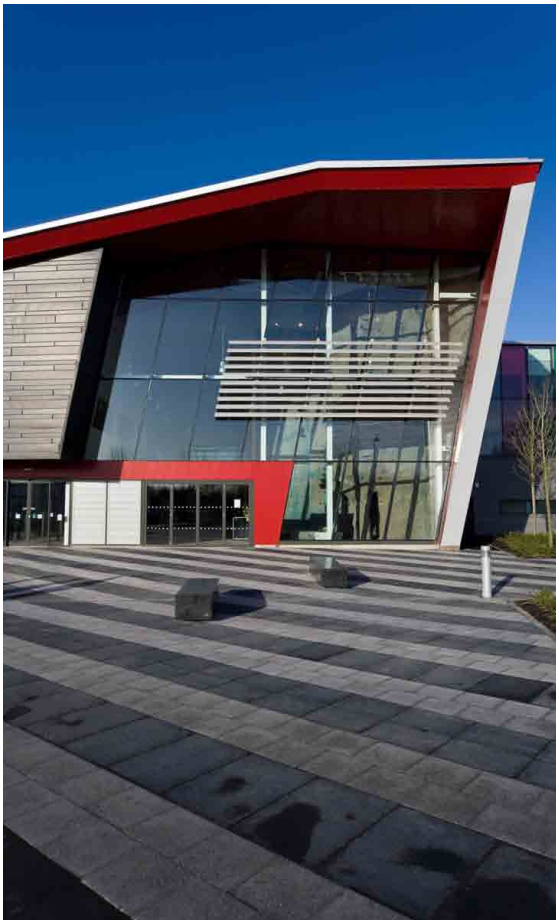
All sports hall projects should use the 7 step process to develop the project brief.

Activity	Hall visits (%)
Badminton	24.4
Keep fit / aerobics / step / yoga	23.6
Indoor five-a-side football / Futsal	18.3
Martial arts	6.3
Carpet / mat / short bowls	6.1
Gymnastics	3.6
Basketball	2.3
Netball	2.1
Table tennis	1.9
Dance	1.8
Trampolining	1.8
Indoor hockey	1.6
Tennis / short tennis	1.5
Roller skating / roller blading	1.2
Indoor cricket	1.0
Multi-sports session	0.7
Racquetball	0.6
Volleyball	0.6
Others	0.6

Most popular sports hall activities taken from a Survey of Sports Halls and Swimming Pools in England - Sport England (1999)

Other activities that can be accommodated in sports halls include:

- Archery
- Boxing
- Children play
- Dodgeball
- Fencing
- Handball
- Indoor golf
- Korfball
- Roller hockey
- Tchoukball.



Imaginative design can invite attention and focus to the building entrance

Quality

Sports halls are open for long hours, seven days a week and take heavy wear as a result. It is therefore important to design durable and high quality buildings with good, attractive and easily maintained finishes.

For overall participation figures see *'Active People Survey'* download (for *'Sport By Sport Fact Sheet'*) available from the Sport England website.

With careful management and use of division curtains a number of activities can be programmed simultaneously

2.0 Site selection and planning

Active design objectives

Plans for the location of new sports halls should consider the objectives set out in the Sport England publication 'Active Design' [9]. It contains guidance and information on how sport and opportunities for people to be physically active can be integrated into planning and development projects. The range of physical and management measures to promote active design objectives include:

- Improved accessibility
- Enhanced amenity
- Increased awareness.

Key issues in the site selection process will include:

- The opportunities for co-location with other community focus points in order to share car parking, access and reception facilities
- The prioritisation of pedestrian, cycle and public transport routes
- The prominence of the location and opportunities for visual communication / signage to encourage use of the facility.

[9] See Sport England publication *'Active Design'*.

Location:

The shape and contours of the available site will obviously influence the siting of the sports hall and any important ancillary facilities, such as artificial grass pitches (AGP) or a group of tennis courts. However, in most instances the proximity of an existing access road and/or the necessary main services will be the main factor affecting its location, if unnecessary and expensive site development costs are to be avoided. It is essential that the site provides:

- Sufficient space for the proposed facility as well as space for future expansion
- Adequate car parking provision, including the potential for overspill parking
- Access for service and emergency vehicles.

External planning

Provision should be made for:

- Car and coach parking closely related to the main entrance
- Disabled parking bays with ramped curbs
- Drop off point adjacent to the entrance
- Appropriate bench seating along pathways.

The entrance should be easy to access, feel safe to all users and be an attractive part of the public realm

- Access and adequate turning provision for service vehicles
- Secure cycle standing located within sight of the office or reception
- Ramps, if there are changes in ground level, and additional handrailing
- Well-lit car parks and footpaths for safe access after dark
- Pedestrian routes planned away from areas of potential concealment.

The location of the building on the site should allow space for future expansion when the opportunity exists. The popularity of specific sports and the need for social accommodation may change over the life of the building and past experience shows that sport's dimensional and safety requirements can increase along with user expectations for better equipped and more comfortable support accommodation.

A planting scheme can assist in linking the sports hall building to its surroundings and particularly in urban projects can help to create a more welcoming entrance. Suitably selected shrub planting will provide a barrier to the building face and help to deter vandalism and give more privacy to glazed accommodation. All new planting will need initial barrier protection.

See Sport England design guidance note *'Car Parking and Landscape Design'*.

External appearance

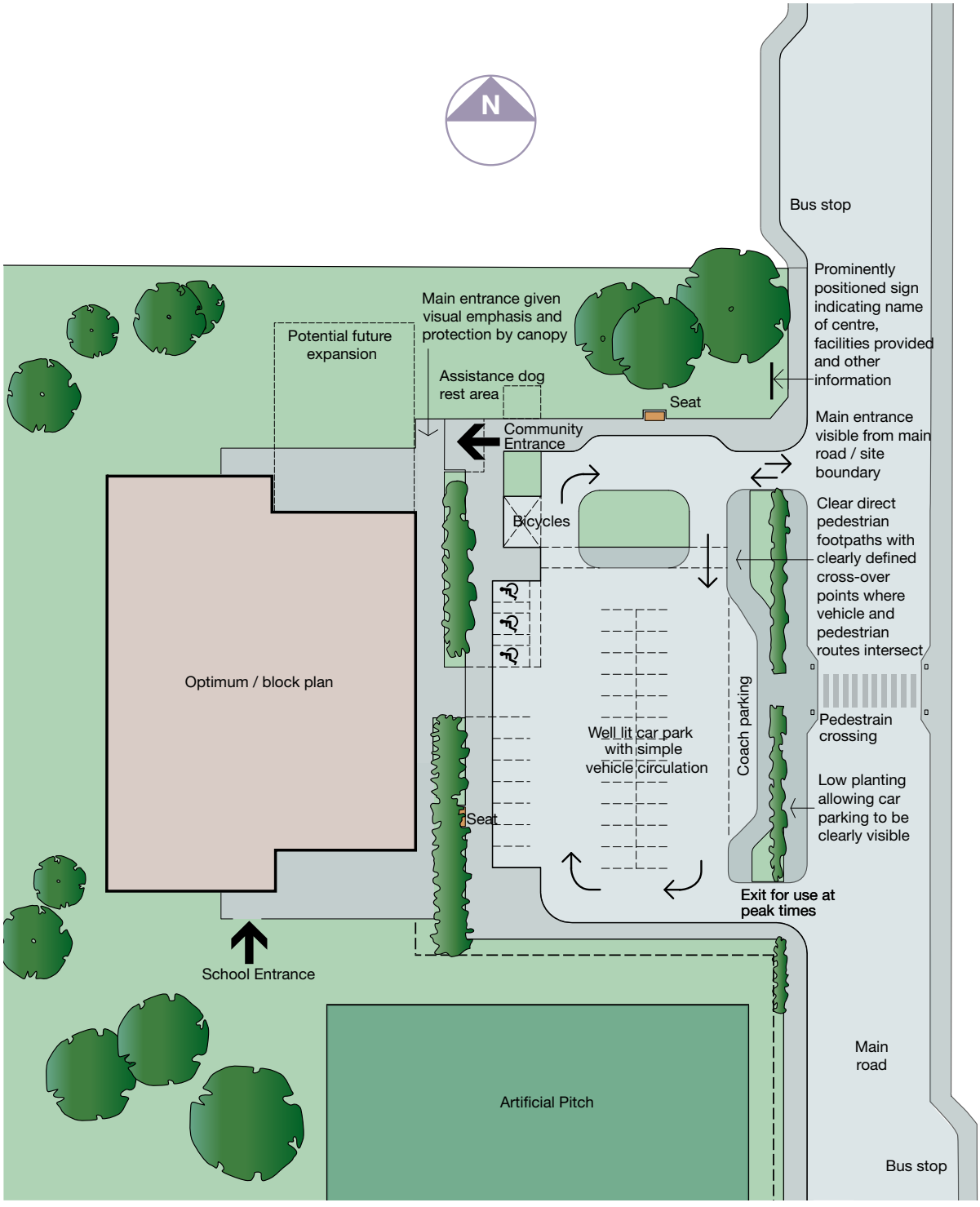
Sports halls often use industrial building components and, unless carefully designed, can all too easily look just like another factory or warehouse, an impression that should be avoided.

By necessity they are large buildings with few windows and require considerable skill in the selection of materials, use of colour and the general design so that they look attractive and inviting by day and night.

In some locations such as on existing school and college sites, it may be appropriate to use brick cladding, but this can often lead to a heavy and oppressive character.

Key design features:

- ***Clearly identified entrance***
- ***Well articulated structure***
- ***Prominent signage***
- ***Crisp detailing***
- ***High quality roof and wall cladding.***



Notional site layout

3.0 Scale of facility

The scale of the facility and support accommodation will depend upon the size of the sports hall and the extent of other activities to be included as part of the facility. For instance sports halls may be combined with swimming pools, ice rinks, etc. as part of a larger sports and leisure facility.

Each project will have its own requirements, but every freestanding sports hall should have:

- Foyer and reception
- Refreshment area
- Changing and toilet accommodation
- Facilities for disabled people
- Office accommodation
- Integral equipment storage
- Hall viewing with seating
- Provision for first aid
- Plant room
- Cleaners store.

This is often expanded to include the following model range of accommodation which complements sports halls of all sizes:

- Crèche [10]
- Pram store
- Club meeting room
- Fitness and exercise studio/areas
- Multi-purpose secondary hall
- Staffroom
- Physiotherapy treatment room
- Licensed lounge
- All-weather external playing area.

Sports halls should be planned to provide:

- A simple, economical and spacious circulation system that is clearly intelligible to the user and permits easy supervision
- The elimination of long, narrow corridors that might confuse visitors and impart an institutional image
- Safe and secure access achieved by design and not by reliance on a closed circuit television system (CCTV).

The circulation pattern should enforce a sequential progression through the building:

- The entrance foyer and reception
- Linked to a social refreshment area
- Leading on to changing and toilets
- Leading to activity spaces.

The need to backtrack should be avoided except where a conscious decision has been made to rearrange accommodation for a specific purpose, such as grouping glazed activity space around the social hub of a centre to allow spectator viewing.

Servicing and plant room access should be remote from the main entrance or arranged on an adjoining elevation with an internal service route direct to kitchen store or bar cellar or into any accommodation that needs to be provisioned for social functions. Plant rooms should be located as close as possible to the most heavily serviced spaces, usually the changing rooms or the deep end of a pool in a wet and dry centre. First aid rooms must have direct or easy access to the building exterior and an ambulance bay should be provided, remote from the main entrance.

[10] Crèches national standards for under 8s day care and childminding, Surestart DfE and DWP.

Sports Halls

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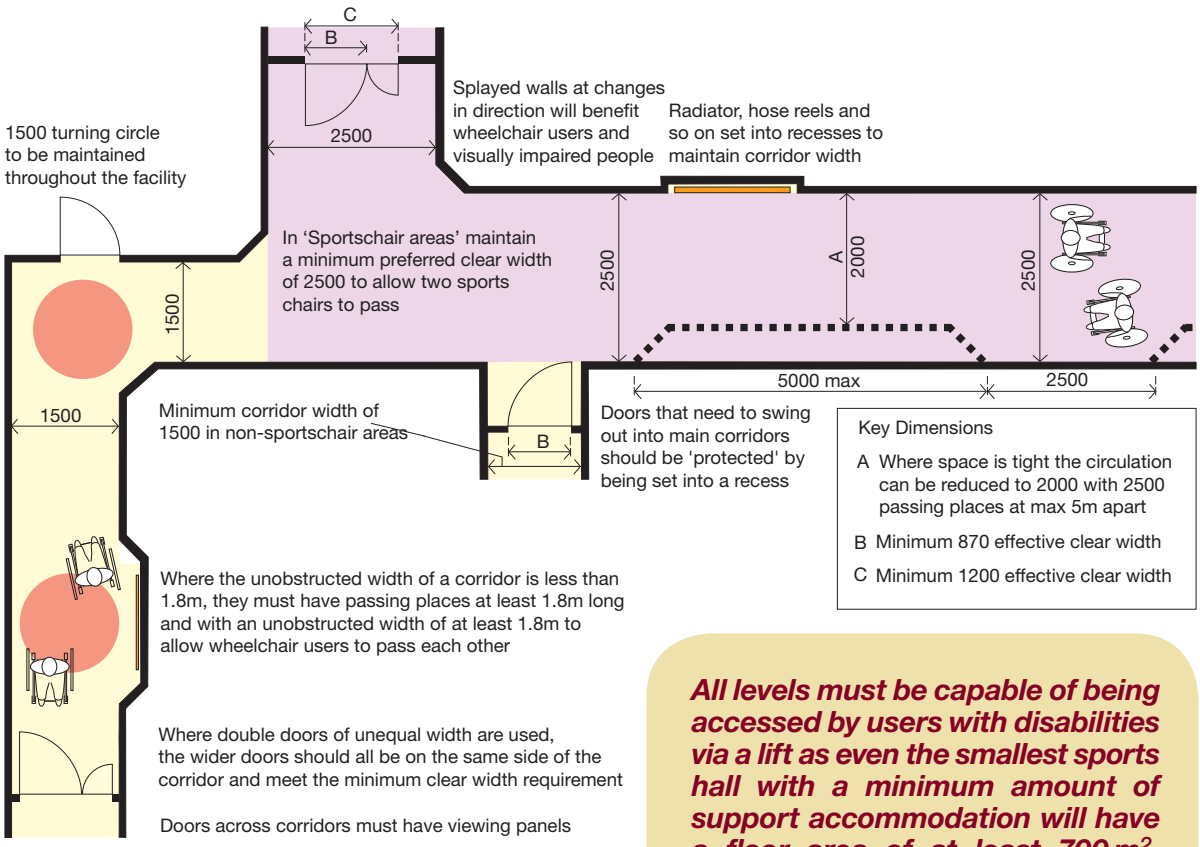


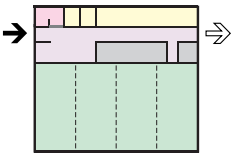
Note: All dimensions are in millimetres

Internal circulation diagram

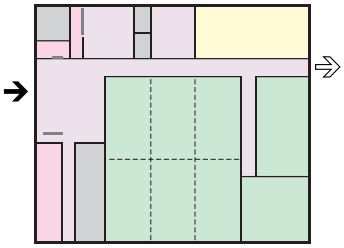
All levels must be capable of being accessed by users with disabilities via a lift as even the smallest sports hall with a minimum amount of support accommodation will have a floor area of at least 700 m². Larger centres will require 2 lifts.

Sports wheelchairs require wider doors, careful consideration is needed during the design stage to allow sports chairs to access all appropriate areas of the building, including changing rooms, toilets and social areas.

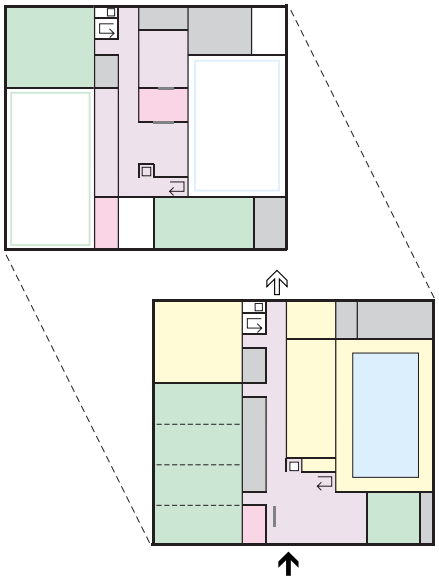
See Sport England design guidance note 'Accessible Sports Facilities'.



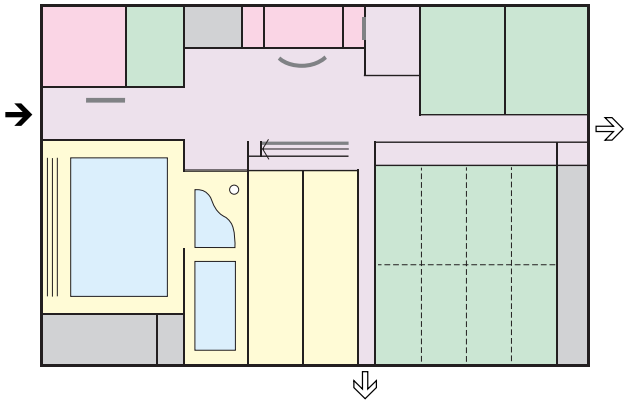
Four court hall with minimum ancillary accommodation



Six court hall with fitness and dance studios

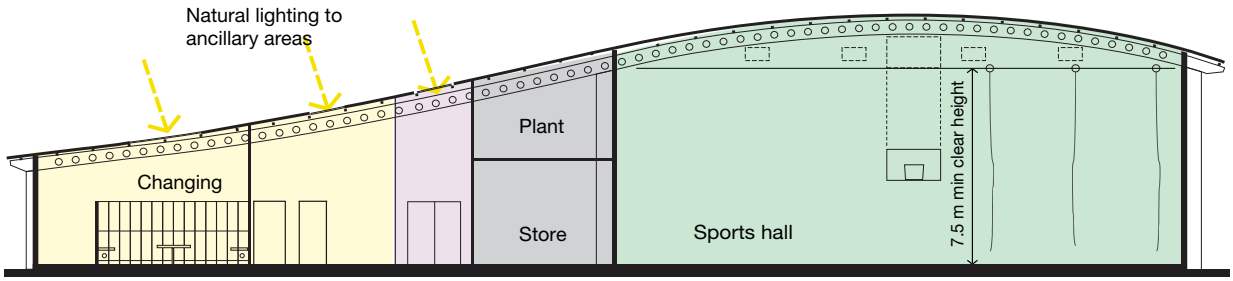


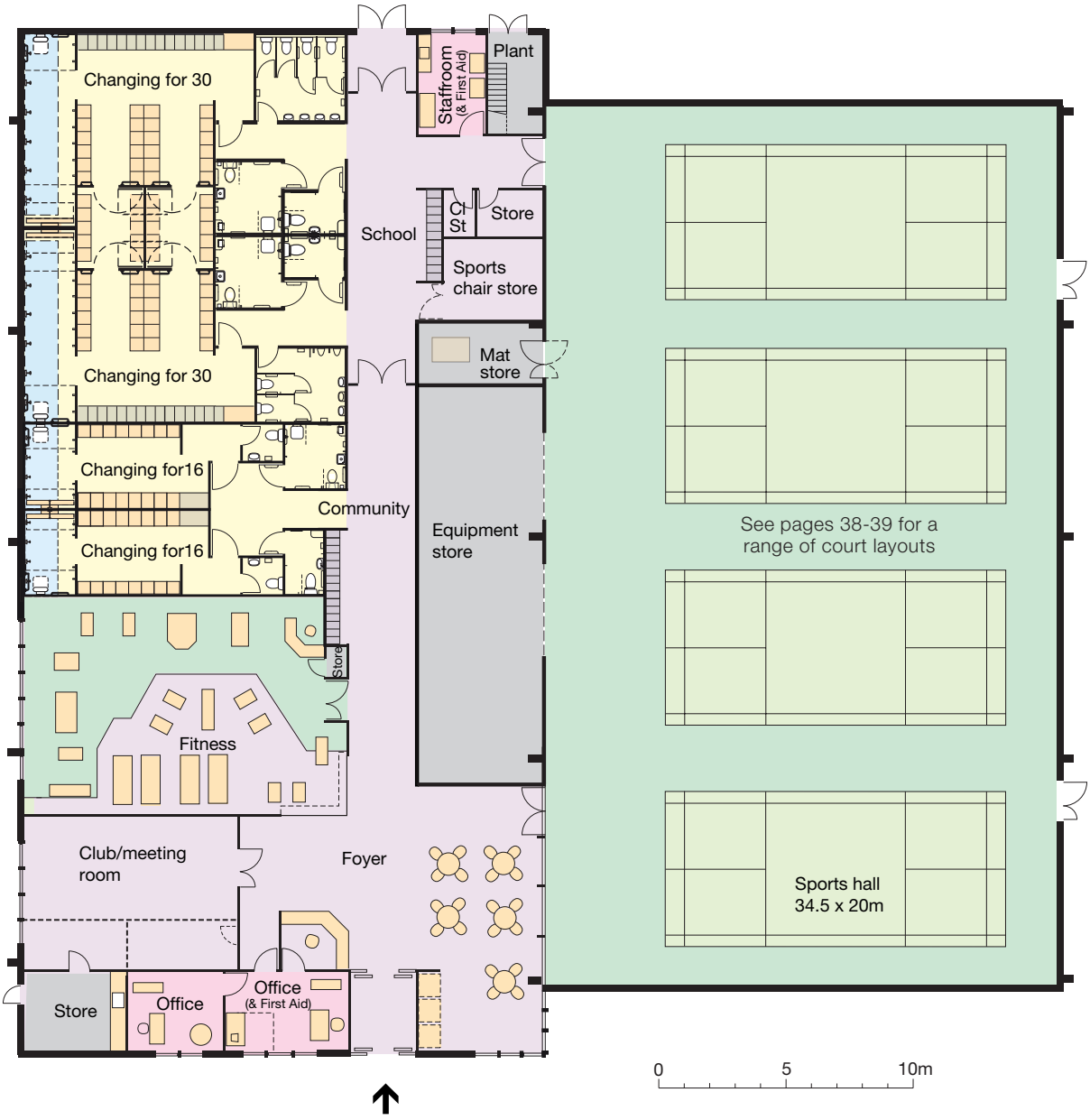
25 m pool, four court hall with social areas and secondary sports space on two levels



Main and learner pools, an eight court hall and other accommodation planned off a mezzanine circulation spine

Block plans illustrating different scales and mixes of accommodation





A 34.5 x 20.0 m sports hall with a typical range of accommodation. Alternatively, the club-meeting room space could be developed as a crèche, soft play or exercise studio

4.0 Hall and centre planning

Main entrance

The design of the entrance should be warm and welcoming. The entrance foyer is the hub of the building and should have sufficient space and volume for people to circulate, view notices or wait for friends in comfortable surroundings. Design to provide:

- Views towards the sport hall and other main elements of the building
- Convenient and secure store for pushchairs overlooked from reception
- Draught lobby to the main entrance doors
- Automatic operation of the main doors which is particularly helpful to wheelchair users and people with young children
- Space for the inclusion of security barriers.

The management strategy will dictate foyer planning. Options for foyer design include:

- reception close to the point of entry with sufficient space for queuing
- an informal hotel type arrangement.

The first has the advantage of close control over those entering the centre, the second provides for a more relaxed and welcoming style of operation. In either case the foyer and its associated spaces, which can include seating, viewing and refreshment areas, should be designed to be as open and transparent as possible. Natural lighting, most probably from a roof source, will help create a pleasant atmosphere. The volume of the entrance is important in creating a comfortable arrival space. A higher ceiling can also help relate to the larger volume of the sports hall.

In dual-use centres it is preferable to separate the main community entrance from the school entrance, so that one is approached directly from the main car park, and the other directly from the school premises. This can reduce excessive usage of the entrance and social areas and minimise wear and tear on specified finishes.

Dual use projects can have implications for the overall building specification.

Check requirements for:

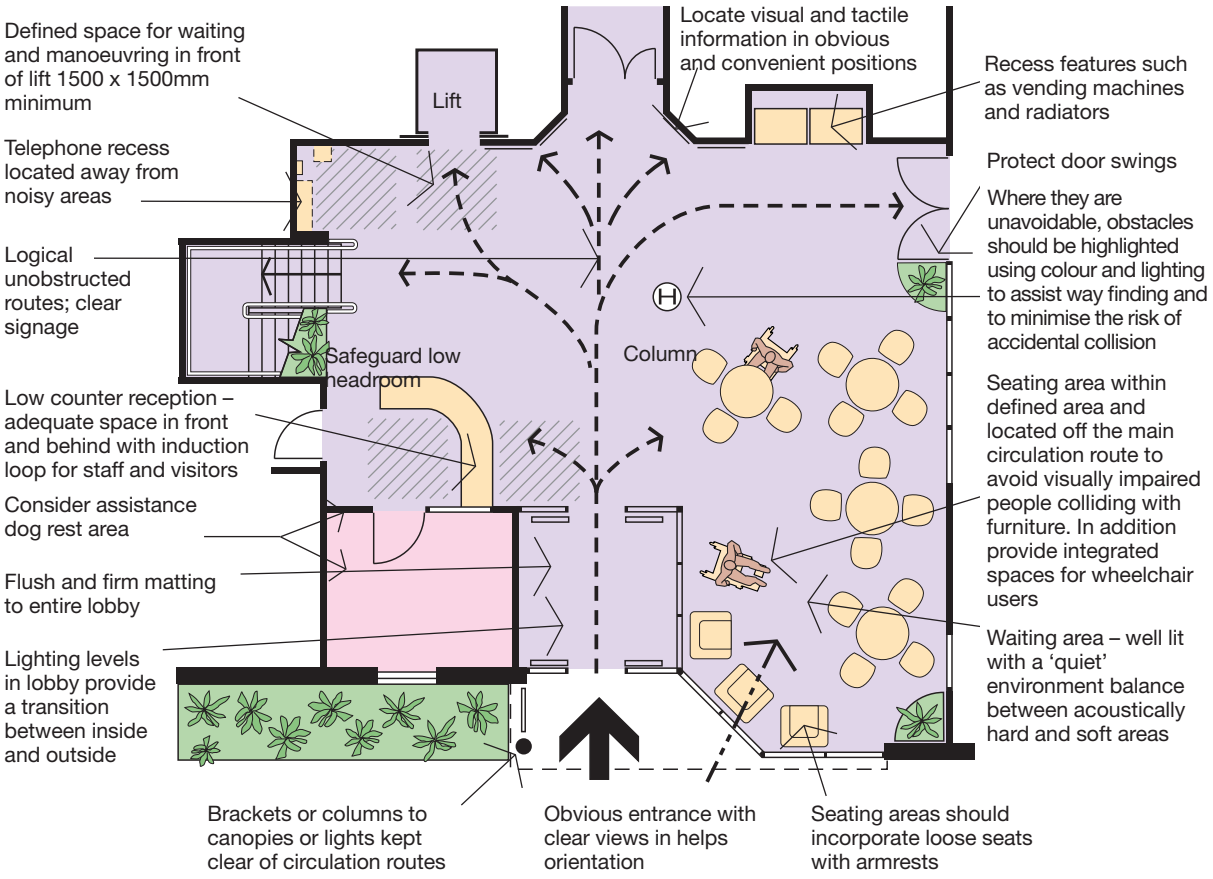
- ***Heating and ventilation strategy***
- ***Escape routes***
- ***Examination requirements***
- ***Acoustics***
- ***Public entertainment.***

Reception and office accommodation

The reception desk should:

- Be prominently sited
- Be of an open design with a dropped level for wheelchair users and children, but with sensitively designed security features as appropriate
- Incorporate storage for lost property and items for sale or hire
- Make provision for the monitoring of fire and security systems
- Allow for the integration of CCTV, PA and other essential equipment (retrofitting such equipment when space is tight can be difficult).

Only in dual-use schemes where club programming predominates is it appropriate for the open reception counter to be replaced with a glazed screen and counter to the staff office.



Reception area and office accommodation

The reception desk and office accommodation should be closely linked. An island reception counter may be used for larger centres to control sports hall, pool, ice rink or spectator access. Isolated reception counters should be provided with an integral secure cash office.

Whenever possible offices should be located on an external wall for day lighting and views over the approach to the building.

A small school / community sports hall might have a minimum administration area consisting of an office for one person with some storage.

Generally, a four-court hall would have a manager's office with meeting space and a general office, unless some administrative functions take place off-site.

Larger centres may include a separate catering managers office, other specialist accommodation such as a rest room and male and female staff changing.

Reception and social areas should be designed for flexibility to allow for different management styles and changing local circumstances.

Open reception desk with lower height sections for wheelchair users and children

Social and viewing areas

Where possible sports halls should be capable of being viewed from social accommodation and every hall with public use, including those on school sites, should have some social and refreshment accommodation. The simplest answer is to extend the foyer to include a seating area overlooking the hall through safety glazing fitted with blinds or a curtain to avoid distracting badminton players or other user groups. Two or three vending machines with adjacent storage are often sufficient for small halls but an alternative is to extend the reception counter for staff to serve drinks and snacks.

Check with operators that there is adequate space for vending machines (and future expansion).

If a cafe area is included it should be:

- Located in or close to the entrance foyer to enhance the welcoming ambience and to enable the centre to benefit from customer secondary spend
- Designed to ensure that standards of decor match successful high street equivalents.

In large centres social and viewing areas can be grouped together and may include:

- A bar and lounge
- Viewing into the hall and other areas.

Views from entrance / reception of climbing wall and other sports activity spaces beyond

Where it is not possible to accommodate these facilities at ground floor level, the social areas should be visible from the foyer and linked to it with a prominent staircase set in a generous well. It is important that this relationship is emphasised and that the social content is not tucked away in a remote corner of the building. Support accommodation will include:

- Storage and servery areas serviced from a nearby vehicle delivery point
- Proper refuse storage and containment with direct access
- If there is a licensed area separate cellarage will be needed and a physical form of segregation may be required.

Viewing of sports halls and other activity areas provides added interest to the social content and assists in breaking down the cellular characteristics common to many older sports buildings. These benefits have to be reconciled with the privacy needs of some occupants so open galleries should be capable of being shut off and glazed screens must be fitted with curtains or blinds.

Viewing of sports halls and other activity areas provides added interest and should be designed to benefit all users - see 'Accessible Sports Facilities' design guidance note.

A well furnished and suitably equipped refreshments area: an attractive image for the leisure environment

Screen panels fitted to first floor viewing to give privacy

Spectator seating / viewing

In larger halls, bleacher seating can be integrated into the wall and linked up to a first floor access route. In smaller halls smaller temporary seating units may be kept in the sports hall store. In all cases, the space requirements need to be considered in relationship to the court markings.

Bleacher seating integrated into the side wall and access gallery above

Changing capacity

Changing capacity should be provided to cope with the normal maximum occupancy level and pattern of use. Calculations should take into account:

- The number of badminton courts (4 players) x 2 for changeover. This number can be exceeded where there is school use and a need to provide for two or more classes. Extra changing spaces will also be required for single sex activities such as keep fit or aerobics
- For small fitness equipment rooms changing spaces are often provided for each item of equipment (based on 5 m^2 of floor area) but for larger facilities this can be discounted by 25-30%
- Aerobics studios and other ancillary halls require one space per 5-10 m^2 and an allowance for overlap [11]
- Squash courts require four spaces per court
- The need to accommodate varying ratios of males/females with buffer or individual changing units as required
- Changing areas need to be fully accessible for disabled users
- Ideally, provide a proportion of cubicles for male and female customers who may prefer privacy
- Have entrances that screen off views from circulation areas eg. privacy screening or lobbies.

The design should allow a minimum of 1.6 m^2 per person with a 0.5 m bench run for an accessible open group changing area and shower areas. More space will be required where cubicles are provided or where dedicated disabled provision is incorporated in the general area.

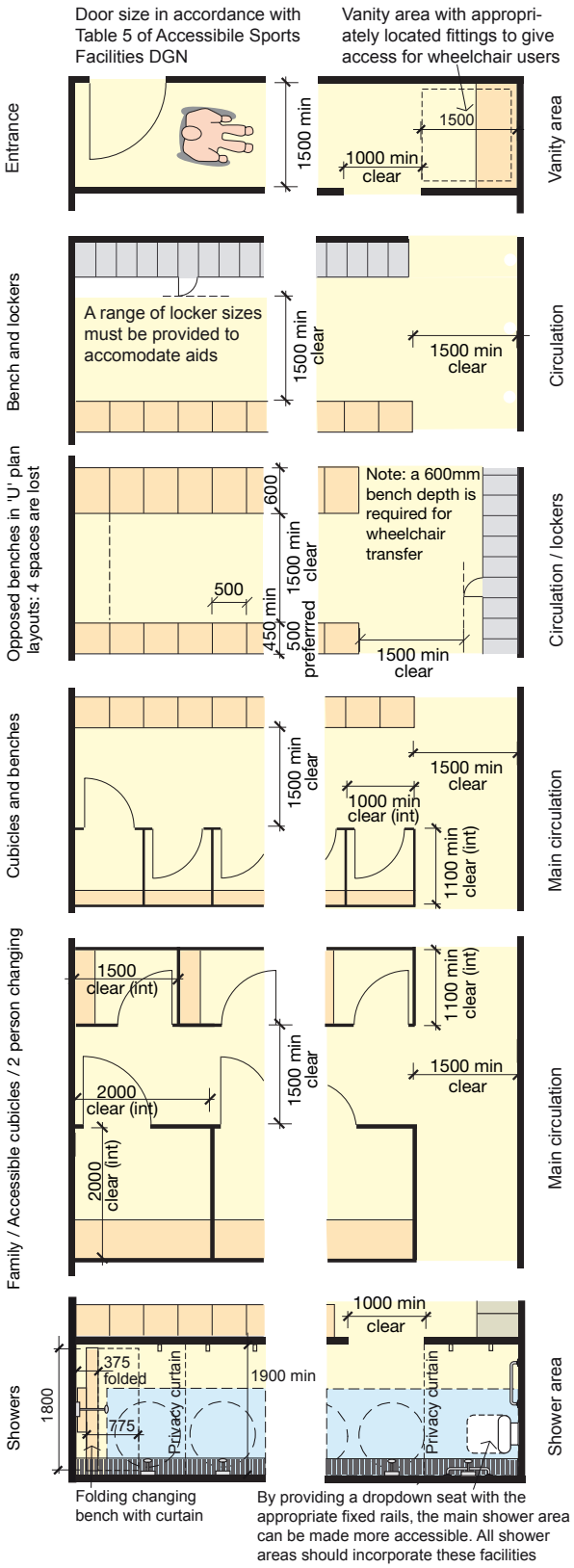
See Sport England design guidance note *'Accessible Sports Facilities'*.

If there is enough capacity the internal changing can also serve external pitches with an artificial playing surface, subject to a suitable access route with hard paving and entrance matting. However, grass pitches must have separate provision with direct access to and from the field and boot cleaning facilities.

See Sport England design guidance note *'Pavilions and Clubhouses'.*

Management feedback shows that split school and community changing works well, subject to supervision and programming.

[11] See Sport England design guidance note *'Fitness and Exercise Studio's'.*



Note: All dimensions are in millimetres

Changing rooms and showers: some key minimum dimensions

Changing areas

Changing areas often attract criticism in facilities that would otherwise be well received.

- Always use high quality, robust and easily cleaned materials to give an immediate and lasting impression of hygiene and cleanliness
- Ceramic tiles need to be used on all wall surfaces in showers and changing rooms, with slip-resistant ceramic tiles on the floors
- Whenever possible changing areas should be equipped with high ceilings and rooflighting. Note that clerestory windows and suspended ceilings are vulnerable to vandalism.

Customer feedback confirms that underfloor heating is liked for changing areas.

Clothes storage lockers

The decision on the location of lockers is often dependant on the local situation and user profile. Lockers in the main corridor can be easily supervised by staff and might help to deter vandalism, whilst lockers in the changing room are more convenient for users. In many centres a mixture of both are provided.

- Allow 2.5 times the assessed occupancy levels for changing
- Locate lockers in changing rooms to offer maximum convenience for users
- Typically, manufacturers supply locker units that are 0.5 m deep, 0.3 m wide and arranged in 1.8 m high columns. These can contain either two individual 'half height' lockers or a single 'full height' locker. There should be a proportion of both to suit the likely use of the centre. Some should be wider (say 0.4 m x 1.8 m) to accommodate larger sports bags, children's buggies and mobility aids [12].
- Behind bench lockers save space but are inconvenient at times of peak use.

Showers

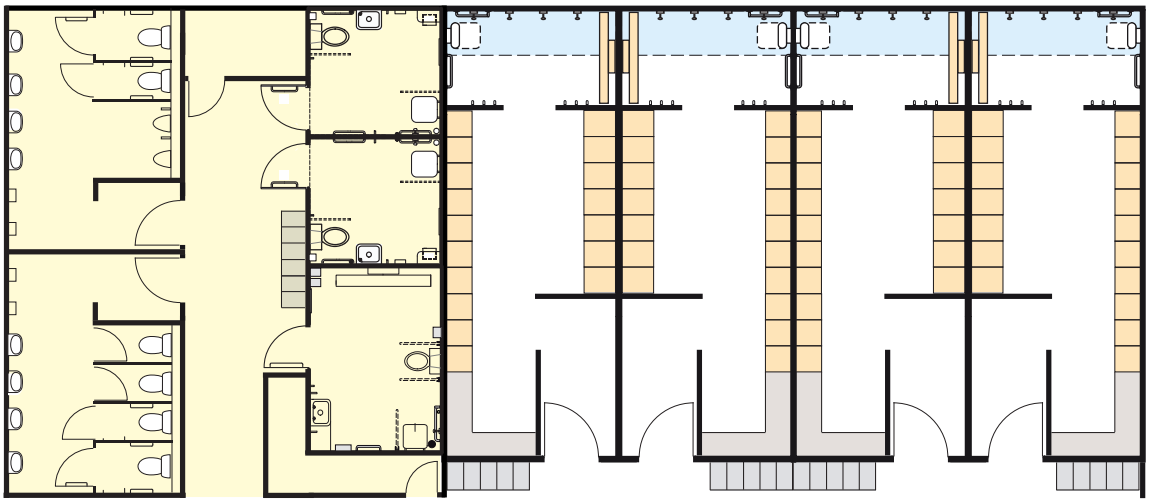
- Allow one shower point to every six changing spaces. Provide a separate dry off area and include a proportion of cubicle showers [13].

[12] See Sport England design guidance note *'Accessible Sports Facilities'* and approved www.inclusivefitness.org

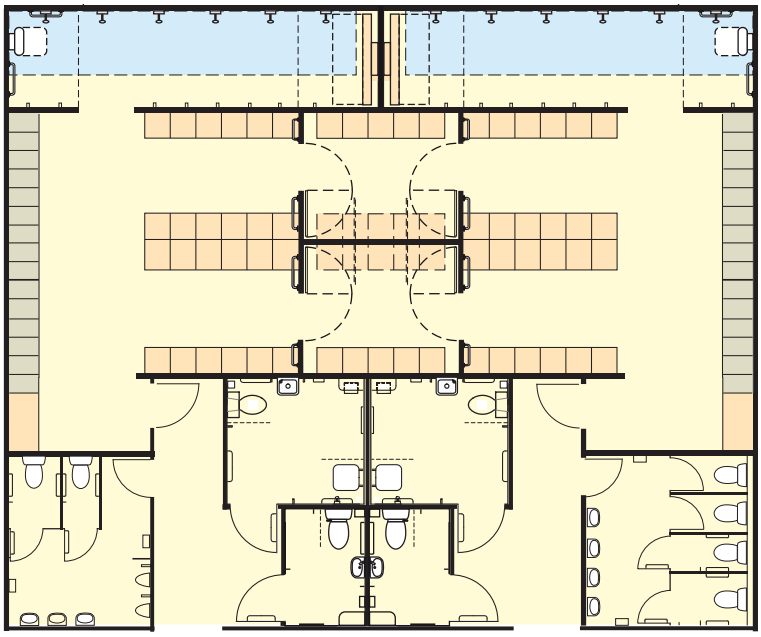
[13] Above the BS 6465-1 recommendations.

Strong colours add to a bright and clean appearance

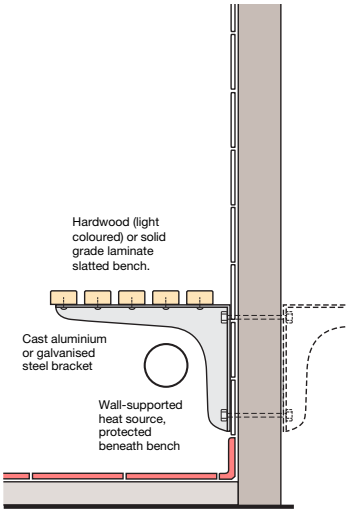
Floor channels with bucket gullies and lift-off grilles give effective drainage in shower and other wet areas. They require regular cleaning



Individual units allocated as required to provide flexibility. Each unit can incorporate toilets if the centre's main facilities are not adjacent.



An arrangement of similar capacity incorporating lockable buffer rooms for flexibility. Generally, this is the more economical approach in terms of overall floor area and is more easily supervised.



Cantilevered benching and wall-hung heating source allow floor surfaces to be easily cleaned

- Shower outlets should be at 0.75 m centres with 0.45-0.5 m between end fittings and side walls. Fittings carried around an internal corner should be to an increased space standard to allow for wheelchair access.
- Showers on opposing walls should be spaced 2.5 m apart to permit a central circulation route and will require a separate dry off area to one end.

See separate guidance note 'Accessible Sports Facilities' for space requirements for showering.

Equipment store

Adequate storage space of suitable proportions, sited in the correct location, is essential for the efficient operation of multi-sports halls.

- A total of 12.5% of the hall floor area is required as a minimum for sports equipment. Community use school halls and large events halls may require more for furniture and specialised fittings
- Locate storage on the long side of four court halls or, where this cannot be achieved, split stores into two areas according to the pattern of hall use
- In larger halls locate storage where it can efficiently serve subdivided play areas
- Stores should have easy access from the hall with wide door openings and at least 2.5 m clear height to allow for storing small trampolines
- Up-and-over, sliding, folding and side-hung doors can be considered but must be detailed to resist impact damage and to be free from projections that can injure users upon impact
- Wide-leaf, side-hung panels usually require a steel frame
- A store depth of 5.0 m is preferred for end-on storage of goals but excessive depth restricts entry and increases handling difficulty
- A separate racked store may be required for roller skate hire. It should be located next to the sports hall entrance
- Provision for floor socket type posts for badminton / netball / volleyball to be stored vertically (if this type of post system is used).

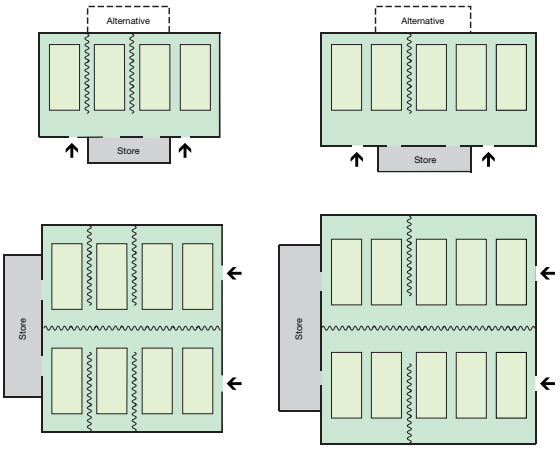
Shelving and wall fixings should be considered to help use the full volume of equipment storage areas.

Access doors to the store should be wide to allow easy access

Allow ample space in the equipment store for all the activities that are likely to occur in the sports hall

Mat storage

Mats can be a potential fire risk and consideration should be given to a separate one-hour fire-rated enclosure vented to the external air and equipped with a smoke detection system. Early discussions with the fire officer are advisable. Maximum use can be made of the available space by storing the mats on a purpose-made trolley, which can be pulled out for safe and easy access. Mats usually measure 2.0 x 1.0 m.



The location of the equipment store should allow easy access to various subdivisions of the hall

Badminton	4 sets of posts, 4 nets, 2 spare nets
Basketball	Scoring equipment Officials table / chairs Team benches Portable baskets (if no fixed goals)
Bowls	4 short mat carpets, rolled, each 1.83 long x up to 0.5 m diameter
Cricket	Roll out mats (to ECB standards for the particular sports hall)
Five-a-side football / Futsal	1 pair portable goals with anchor points, each 3.66 / 4.99 x 1.20 m
Handball	1 pair goals, each 3 x 2 m
Hockey	1 pair goals, each 3 x 2m
Gymnastics *	Range of apparatus with anchorage points and floor mats
Judo/karate	Mats, each 2 x 1m (full 14 x 14 m matted area with an 8 x 8 m combat area requires 98 mats)
Netball	1 pair adjustable posts, each 3.05 m high
Table tennis	6 tables, folded, each 1.855 x 1.830 x 0.65 m, nets and supports
Team benches	2
Trampoline *	2 folding trampolines, each 4.60 / 5.20 m x 2.75 / 3.05 m x 2.25 / 2.00 m high when folded
Volleyball	Posts* and nets / officials table / chairs

Notes:
* Floor socket required

Typical schedule of loose equipment for a four-court hall (dependant on sport priorities for the particular project)

Special events

Extra large external doors will be required for additional large items of sports equipment, and mobile seating and so on for competitions and exhibitions. Bleacher fold-out seating should be considered for halls with six or more courts, located in wall recesses so as to retain a flush rebound surface.

For larger halls a suitable adjustment should be made for the additional number of courts and the proposed programme of activities.

Toilet accommodation

Toilets can be planned to share a common access lobby with changing rooms. This is an economical, proven arrangement that concentrates services and affords convenient access to sports, social and office areas.

Male:	One WC, one washbasin, one urinal per 15-20 users
Female:	One WC per 7-10 users, one washbasin per 15 users.

The total toilet provision should be calculated on the likely maximum occupancy of the building in accordance with BS 6465-1: 2006.

	4-6 court hall	8-12 court hall
Accessible changing provision		
Unisex accessible changing room with WC	2	2*
In addition, provide an accessible changing cubicle within the main changing area	❍	●
Changing room large enough for wheelchair teams	●	●
In addition, provide a unisex 'Changing Places' changing room	❍	●
Accessible toilet provision		
Dedicated unisex Accessible WC compartment on each floor (in addition to any provision within unisex accessible changing above)*	2	2*
Provide a minimum of one cubicle each within the general male and female toilets suitable for an ambulant disabled person	●	●
In addition, provide an accessible WC compartment located within the 'Sports Chair Zone' to serve people using large sports chairs	❍	❍
Changing Places provision: include as indicated under 'Accessible Changing Provision' above		

Key: ● Required ❍ Recommended

Notes:

See *'Accessible Sports Facilities'* for details of the layouts for the above facilities.

* The above figures are the minimum and should be increased if necessary to reflect the anticipated amount of use and the relationship to the individual facilities. Unisex accessible changing facilites must be located wherever there is general changing provision.

Accessible changing and toilet provision for sports halls

As a minimum there should be at least one unisex accessible toilet at locations where there is public toilet provision. See BS 8300. It is unreasonable to expect disabled users to travel further than other members of the public. Where single sex changing facilities are provided, an additional unisex accessible toilet easily accessed from the main circulation area should be provided, thereby enabling a disabled user to be assisted by people of either sex. Additionally, disabled user's needs can be met within the general changing areas by provision of:

- Open bench changing or double sized cubicles
- Showers fitted with fold down seats.

See Sport England design guidance note *'Accessible Sports Facilities'.*

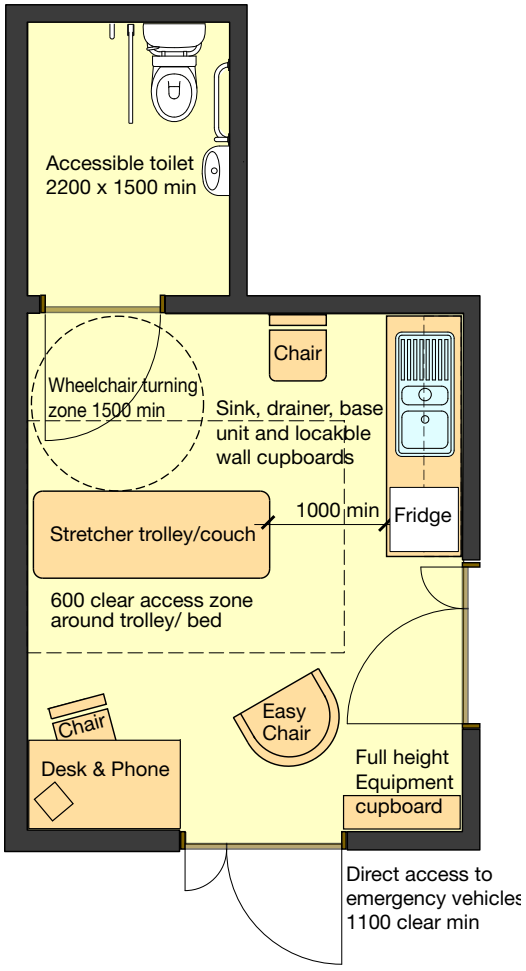
Independent panelling systems protect pipework and simplify surface cleaning

First aid / physiotherapy room

The most basic provision is shared use with an office or staff restroom containing a sink or washbasin , a secure first aid cabinet and access for a stretcher. A clear space of 2.0 x 1.6 m is recommended as a minimum. A supply of drinking water should be available and there should be an adjacent WC compartment with a hand basin.

Based on the provision for school table 7 in BS 6465-1: 2006

Where a dedicated first aid room is to be provided, an increase in dimensions may accommodate a physio treatment room, and/or a drug testing facility.



Note: All dimensions are in millimetres

First aid for a medium sized centre. Small centres can incorporate first aid within a staff area subject to sufficient space being available

Cleaners store

Even in a small hall separate provision for the storage of cleaning equipment and materials must be made. Locate the store close to the changing accommodation and include a Belfast sink.

Staff facilities

BS 6465 recommends separate staff facilities for school situations. The Workplace (health, safety and welfare) regulations 1992 require that there should be a suitable seating area for use during breaks. It needs to be clean and located where food cannot get contaminated.

Larger centres require more dispersed accommodation which can include separate toilets for staff.

Secondary areas

Valuable complementary facilities include:

Ancillary halls

- ***Dance***
- ***Exercise***
- ***Martial Arts***
- ***Social***

Fitness equipment areas

Fitness equipment room should be bright and attractive. The internal design can often be enhanced with the use of natural lighting and carefully considered external views.

Fitness equipment room

A fitness equipment area can be a valuable complementary space to a sports hall. It allows a range of general fitness and conditioning activities to take place on a more casual basis than the main sports activities that are usual on a programmed basis for the sports hall. It allows users to increase their own personal strength and fitness and to obtain increased attainment in their chosen sport. The minimum practical floor area is 25.0 m^2 and 80.0-100.0 m^2 is the norm for small sports centres, with a preferred ceiling height of 3.5-4.0 m.

Larger centres might devote considerably more space to fitness training, often combined with an exercise studio, integral office / reception, cubicle changing, sauna, spa pool and lounge. Separate guidance notes deal with these subjects in more detail.

See Sport England *'Fitness and Exercise Spaces'* design guidance note.

Fitness rooms benefit enormously from having windows or roof-lights but for ground floor locations it is advisable to provide external screening for privacy. These spaces also benefit from increased volume. Mechanical ventilation or air-conditioning is always required. Glazed panels to social or circulation space help to open up and promote these activities but all glazing, external and internal, must be fitted with blinds or curtains.

Ancillary halls

Ancillary halls can range upwards from a size of 10.0 x 10.0 x 3.5 m high for a range of physical and social activities. These may be of lower specification than the main hall, and be suitable for activities such as training, practice, exhibitions and wet weather social events that require less height than the main sports hall. The potential for social use will be enhanced by ease of servicing which can result in adjoining catering or bar space. Equipment storage should be a minimum of 10% of the hall area.

Dance and exercise studios fall within this category with minimum recommended dimensions of 15.0 x 12.0-15.0 x 4.5 m high. Windows should be at high level and admit only north light. Flexible use of space can be achieved by including two or more squash courts with sliding division walls.

Secondary halls have similar flooring requirements to main halls and benefit from increased height. Natural lighting contributes to the success of these spaces but must be able to be blacked out.

5.0 Detailed design of the sports hall

General design

The hall is a functional space with stipulated court and safety margin dimensions and with unobstructed clear height requirements.

- Surfaces should be flush and of consistent colour. Applied design features should be avoided. A successful interior should rely on a careful selection of materials, colours and lighting.
- Natural lighting invariably contributes to the hall's ambience but a suitable system will be expensive and difficult to reconcile with sports lighting requirements, particularly those of badminton. See Section 6 for more details.

Access to and from the Sports Hall

The number, width, height and location of access doors to the sports hall will depend on the overall building layout, the fire strategy, proposals for the delivery of large equipment, and the required evacuation time. Sports hall access doors should open outwards to avoid creating a hazard to the users within. Additional doors may be required to give direct access to sections of the hall that can be divided into separate sections.

Structure

- Columns and beams should be laid out so that they run between the badminton courts in order to avoid conflict with the overhead light fittings and the hanging of division netting. See recommendations for badminton and the Sport England design guidance note *'Badminton'*.
- Columns can be wholly or partly within external walls or outside the building envelope. They should never project into the hall.
- Additional structure may be required to support specific items of fixed equipment such as basket ball goals.
- Purlins should be avoided when possible in favour of a structural deck spanning between the main beams. When Z-purlins are used they must be painted white to blend with the roof decking.

Sports floor

A specialist sports floor is the critical element in providing a comfortable and safe place in which to play sport. Halls may also be used for some non sports purposes but the primary function of safety requirements should not be compromised.

A range of materials can provide good multi-sports floors including various timbers such as beech, maple or oak, either solid or veneer, and various composition and synthetic materials. Key required features can be summarised as follows:

- The sports floor should conform with the appropriate performance standards for the priority range of sports to be accommodated (for example an area elastic floor complying with BSEN 14904 or a specific National Governing Body standard).
- The structural loading must accommodate special features such as bleacher seating or roller skating.
- The positions of fixed and portable sports equipment and their floor sockets should be integrated into the design.
- The floor colour should be considered in order to create an integrated design with wall reflectance and lighting scheme. (The walls should have a 40-50% light reflectance).
- Mats should be provided for sports that cannot be accommodated on the chosen sports floor (Note that cricket mats can only be effective for specific floors. See ECB performance specification).

Court marking lines are painted on most sports floors. PVC tape is not usually used, except for temporary courts, whilst inlaid lines are an option for

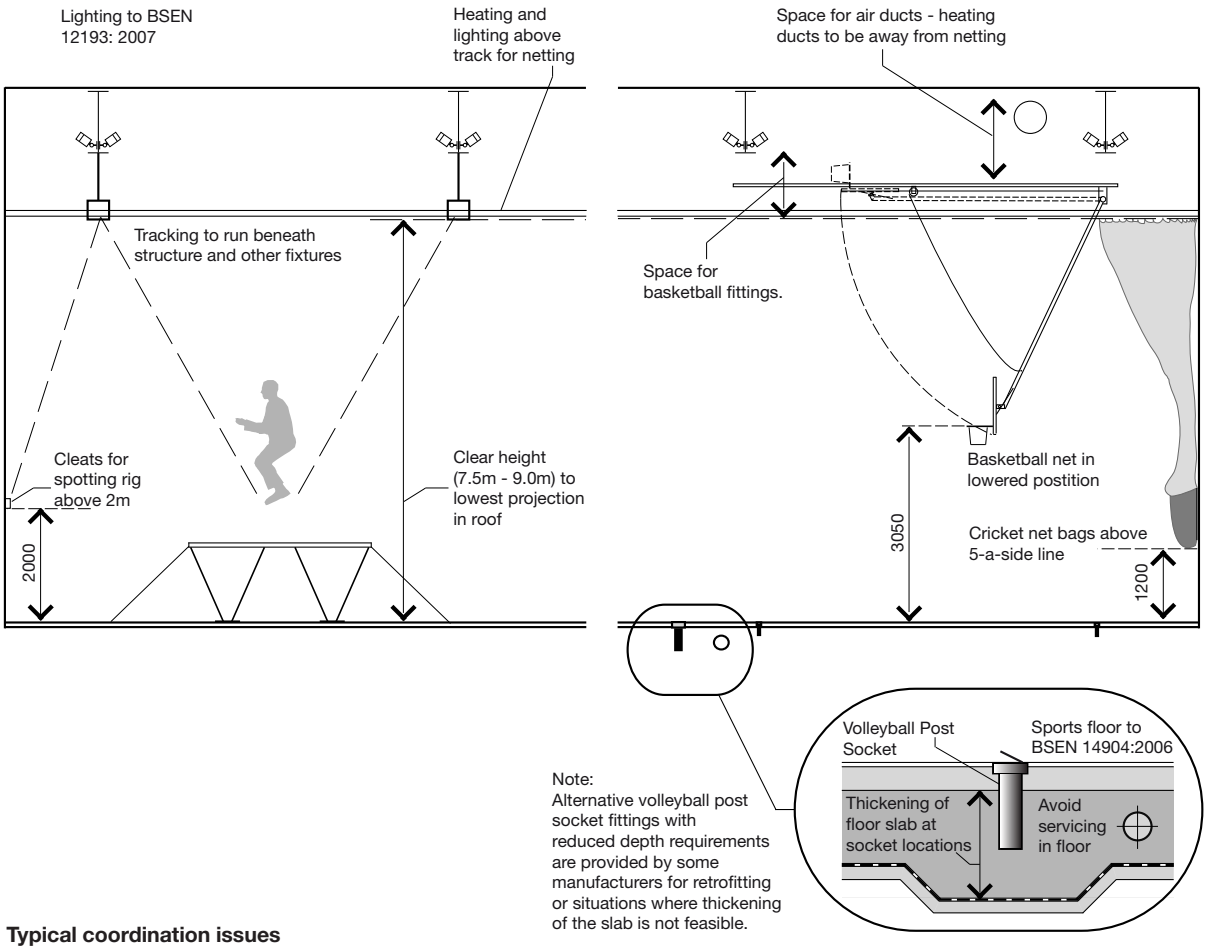
Sport	Line colour	Width
Hockey	Blue or Other	50mm
Netball	Red	50mm
Volleyball	Green or Other	50mm
Five-a-side football	Other	80mm
Basketball	Black	50mm
Tennis	Yellow	50mm
Badminton/ Short Tennis	White	40mm

Recommended court marking line colours & widths

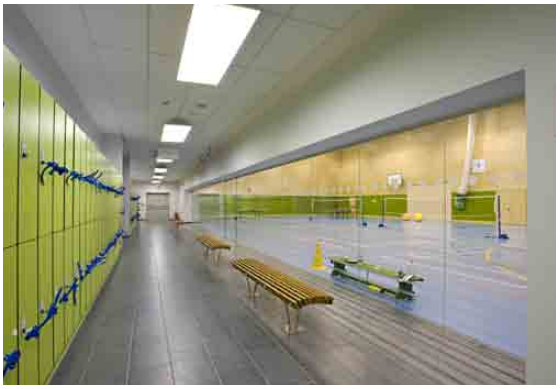
a limited number of sports floor products. Most sports require white lines for major competitions although yellow is used for handball and sometimes hockey and basketball. For multi-sports halls a range of colours is required to avoid confusion.

See Sport England design guidance note *'Floors for Indoor Sports'*.

A combined elastic floor, walls of the right reflectance value and compact fluorescent lights between badminton courts provide an excellent sports hall environment.



Typical coordination issues



Flush glazed panel and access door to give viewing from the locker area into the sports hall

Internal walls

The internal walls should be flush-faced and impact resistant. Options include:

- plywood
- fair faced brick
- painted block work
- frameless or flush-framed glazed panels.

Whatever material is selected, it is preferrable if it runs full height and with a consistent colour as horizontal changes in material cause visual obstruction to badminton players and can result in a stepped back surface.

- A diaphragm wall construction can be used in all masonry solutions.
- The reflectance value should be generally around 40-50% to give sufficient contrast to a white shuttlecock but not so dark as to result in an oppressive interior[14]. See Section 5, page 26.
- The wall colour should contrast with the floor and be uniform across the wall plane.
- Include a 0.15 m skirting designed for easy replacement if roller skating will take place in the hall.
- Doors and door frames should be flush with the internal surfaces, and should open outwards away from the sports hall. Escape doors require panelling above and below the crash bar (See diagrams on p29.)

[14] For cricket a lighter coloured end wall (reflectance value >0.7) will be required behind the bowler end and additional lighting for cricket nets. See ECB recommendation for club and school cricket. BSF Cricket Data Sheet England and Wales Cricket Board (ECB).

See Sport England *'Badminton'* design guidance note for requirements for badminton in dedicated and multi-use sports centres.

Standard proprietary flush door with a flush viewing panel, opening outwards away from the sports hall

Colour	Code *
Blue	86 BG 43/321
Green	30 GG 40/290
Blue green	53 GG 50/360 87 GG 51/291 10 GG 48/366

Notes:

* ICI colour code (Dulux) where the central number represents the surface reflectance. i.e. 86 BG 43/321 is a colour with a 43 % light reflectance value (LRV).

Typical sports hall wall colours from the ICI Dulux Range.

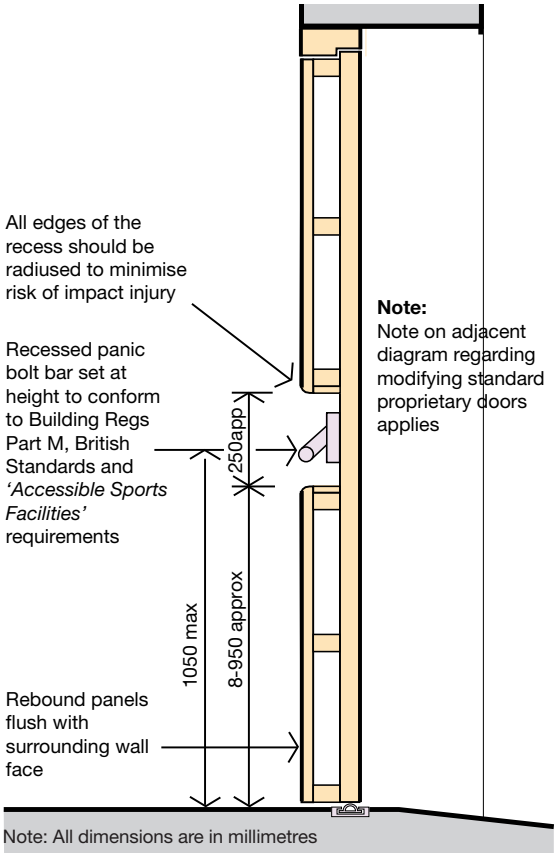
For dedicated badminton centres, colours with lower light reflectance values (LRV) are preferred, whilst in constrast for a multi sports hall, a higher LRV will help give a greater spread of light within the space. Where cricket nets are installed lighter coloured end walls or curtains are preferred to help players see the cricket ball.

See Sport England design guidance note *'Badminton'* and TS3 - *'Indoor sports halls with cricket provisions'* available from the ECB website.

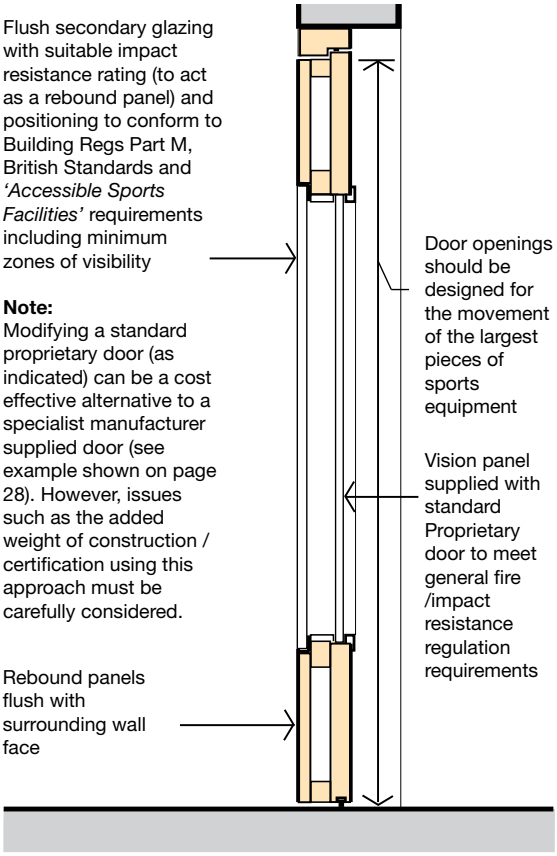
Flush doors, especially those with panic bolt mechanisms, are often difficult to get right and consideration should be given to using metal frames and procuring as a single source supply item (like an engineered window).

Sports hall walls should be detailed for safety and without hazardous projections. Flush surfaces should extend to 2.0 m minimum, preferably to 2.7 m above floor.

Store doors should be flush detailed, and unless they can only be opened by operators and otherwise kept locked, they should not open out into the sports hall Doors may need to perform as rebound panels and therefore their construction needs to be robust and safe for users. Net bags should have no projecting fittings/features that could create a hazard and be high enough to not compromise the five-a-side rebound zone (1.21 m).



External escape doors must be panelled out to line through with the wall surface. The lower section can then form part of the five-a-side football rebound zone (1.21m high along walls) and a flush facing is essential for overall safety.



Internal doors must be panelled out to line through with the wall surface, including vision panels which must have suitable impact resistance as part of the rebound zone.

Wall colour should have a reflectance value of around 50%. Only halls specialising in table tennis or dedicated badminton centres will benefit from a darker background.

- Climbing walls should not be located in a sports hall. For safety and operational reasons they require a separate dedicated space.

Exterior facades

When selecting materials for exterior facades consider the following points:

- Successful external claddings can include colour-coated steel. Where profiled metal is used this looks better when run horizontally.
- Cedar boarding can be appropriate as it is cheaper than metal cladding and if properly specified requires minimal maintenance.
- Metal cladding used above brickwork at a lower level invariably gives a very industrial appearance and should be avoided.
- External windows and door frames must be in powder-coated aluminium or galvanised steel, PVCu or hardwood.

Roof

The roof soffit and structure should:

- Be uniform, preferably white with more than 90% reflectance value
- Make provision for acoustic absorbency. Reverberation time should not exceed two seconds at mid-frequency [15]
- The roof decking should span the main beams to achieve minimum visual obstruction
- Where unavoidable, internal linings or suspended ceilings must be impact-resistant
- Suspended ceilings are generally inappropriate for sports halls. Mill-finish standing seam aluminium roof finish is likely to provide the best value for money for most sports buildings and can be curved, avoiding interruption of the ridge.

Where the location demands a slate or tile roof the better quality pressed steel sheet products can provide a convincing appearance for buildings of this scale without the weight penalty of the genuine product.

Fittings

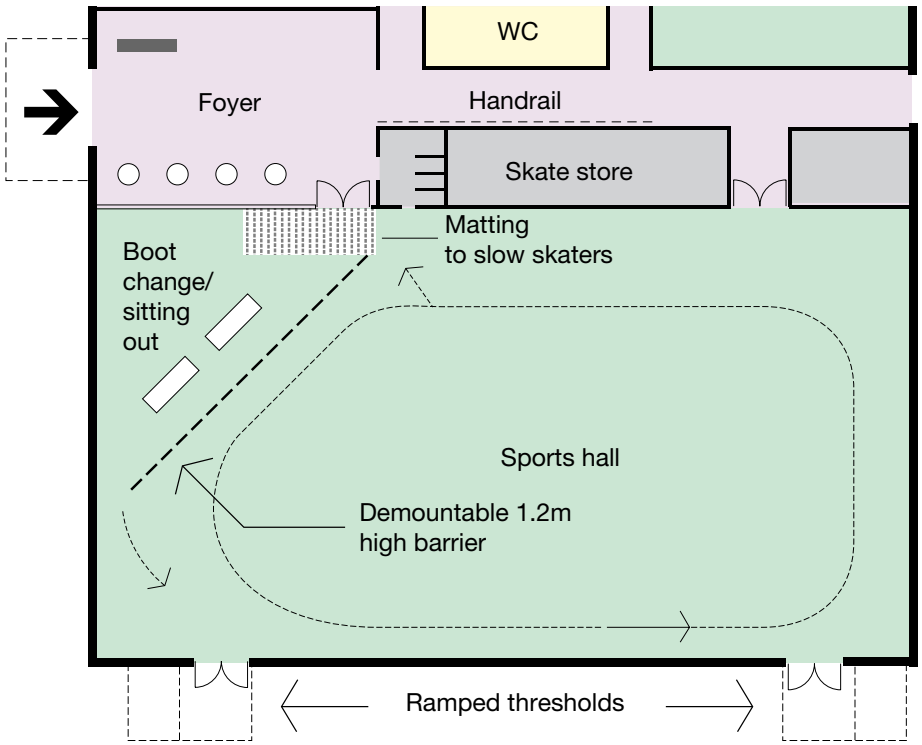
Early consultation is recommended with specialist equipment companies to ensure coordination of clear heights, court markings, floor fittings and safety requirements.

The hall should be equipped with a range of fixed equipment depending on the chosen priority sports. Typically this might be:

- Wall- or roof structure -mounted basketball goals with additional practice goals fixed directly to the wall
- Roof structure-mounted spotting rig for gymnastic (wall fitting to be above 2.0 m high) and tracked division netting
- Cricket nets
- Floor and possibly wall sockets with flush fitted cover plates will be required for specific items of equipment
- Pulley-mounted net bags.

Care should be taken to ensure that there are no dimensional conflicts with the court markings and the safety requirements.

[15] See later section on acoustics



See Sport England publication *'Developing the Right Sports Hall'* for sports activities and business plan considerations when developing a project brief. Roller skating might be popular for some sports halls but requires an appropriate specification for the floor, skirtings, music equipment and storage.

6.0 Environmental and sustainability issues

Heating, lighting and ventilation services can account for a significant proportion of construction costs. It has been estimated that energy can account for between 24-30% of the overall operating cost of a dry sports facility. It is often the next largest item to staff cost. The full environmental impact of a sports hall building through its life cycle should be carefully considered and it is recommended that the BREEAM assessment method be considered [16].

Energy efficiency

Installations should be designed for simplicity and serviceability to achieve the required environmental conditions and energy saving criteria. Good insulation and air sealing of the building envelope should be achieved together with careful selection and operation of the optimum temperature and ventilation rates for the occupied space.

Simple energy conservation techniques, such as heat recovery and efficient thermal and time controls will also be beneficial. The way sports halls are used make them particularly suitable for occupancy sensors or presence detectors to automatically control heating, lighting and/or ventilation systems, in order to avoid wasteful conditioning of spaces when they are unoccupied. Unlike other building types, sports halls generally need to exclude solar penetration and are less able to benefit from solar gain as a contributor to energy efficiency.

Overall heating and ventilation requirements

The heating and ventilation of a sports hall will be required throughout the year.

The main active sports are likely to be badminton, basketball, and five-a-side football / futsal and a heating system that gives an overall minimum temperature range of 12 to 16° C will satisfy most users. However, temperatures of up to 20° C may be required for less physically intensive sports such as short-mat bowls and for other sports, coaching and training where participants may be static for periods of time. In practice, sports halls may often require low levels of heating but do benefit from systems that have fast response times in order to be adaptable to the needs of different user groups.

The use of presence detectors and temperature sensors should be considered for all systems.

Subject to the introduction of adequate fresh air to meet the requirements of occupants (minimum 20%), the air in the sports hall can be re-circulated in order to minimise the energy needed to heat up the incoming air. Such a system can have automatic controls and carbon dioxide or other types of detectors to achieve acceptable air quality.

The fresh air requirement will generally depend on the number of occupants, unless dependant on the cooling needs. The CIBSE Guide does not define a value for sporting activities but a value of 8-12 l/s of fresh air per person is appropriate in most circumstances. A ventilation rate of approx 1.5 air changes per hour is adequate for most 4 court sports halls of between 7.0-8.0 m high assuming heat gain or large occupancies are not an issue and that there is good air distribution.

Air velocities should generally be kept below 0.1 m/s with the sports activity volume. This is particularly important for badminton where the flight of the shuttle cocks is likely to be up to 6.0-7.0 m over the court.

In the interests of sustainability, consideration should be given to providing separate controls for heating and ventilation so that the space can be maintained at a comfortable temperature ready for use, and the ventilation is linked to occupancy and air quality. Such an approach can provide fresh air at the required rate and save on fan power and heating energy.

Common complaints in sports hall H & V systems:

- ***Overheated / stuffy in warm summer periods (opening the escape doors can exacerbate the problem)***
- ***Too cold / draughty in winter***
- ***Smells from the heating systems when started up after being dormant in the summer (school sites).***

[16] The Building Research Establishment Environmental Assessment Method (BREEAM) includes leisure buildings. http://www.breeam.org/podpage.jsp?id=388

Choice of systems

The following systems are often seen as the most appropriate for sports halls:

- Radiant heating ceiling panels with a separate ventilation system
- Combined ducted warm air and ventilation delivering through air handling units (AHU).

A ducted warm air system has generally been seen as the preferred method of integrating heating and ventilation. It can give a good degree of control of air quality throughout the year and achieve good distribution and efficiency.

In some instances fan convectors and unit heaters with outside air provision can provide a limited amount of ventilation, but this is generally not very substantial or effective.

High-level extract fans in the roof or walls together with appropriate means of outside air supply can often be used as a separate ventilation system and can be effective, subject to air velocities not affecting shuttlecocks and large volumes of cold air causing high heating loads or discomfort. The noise caused by wind acting on the external damper can also be an issue.

Natural ventilation systems such as ventilation towers that utilise wind energy can also be considered. However, these will need some form of supplementary system to deal with warm windless days and some means of tempering the cold incoming air during cold winter periods. The risk of unwanted air movements needs also to be considered. Some natural ventilation products utilise solar panels to activate an auxiliary ventilation fan on warm windless days.

Where the hall is part of a larger centre, the choice of system may be influenced by the needs of other areas. Even in the smallest project there are likely to be changing rooms and entrances that will need to be heated and ventilated and might be integrated with the hall system and give scope for shared fuel source and plant room space.

Light fittings suspended from main beams located between the badminton courts. Additional lighting for cricket nets. Clear height requirement taken to the lowest point. Drop down basket ball nets to fold up to maintain clear height requirements

Natural ventilation towers in roof to give controlled ventilation and compensate for the heat loads from occupants, artificial lighting and solar gain, and anti-glare roof-lights to supplement the artificial lighting

See Sport England design guidance note *'Floors for indoor Sports'* for concerns about potential problems with the thermal stability and performance of floors with under floor heating systems. The coordination of the exact locations of floor sockets for sports equipments needs to be considered. Often floor sockets are installed after the building construction is completed and under floor heating system may limit future flexibility. The response time of under floor heating systems to cope with varying programme needs may also be a consideration.

The type of heating system should be identified early to coordinate with the 'clear height / space' requirement and fixing of sports equipment (See diagram on page 27). Examples are:

- ***Radiant heating systems should not be too close to netting***
- ***Air distribution ducts should not impact upon clear heights and sports use within the hall***
- ***Floor socket conflicts with under floor heating (including future installations).***

See Sport England design guidance note *'Floors for Indoor Sports'.*

Artificial lighting

Adequate artificial lighting is an essential element of the sports hall and should be integrated into the design from the outset, rather than be added in later.

The sporting activities often demand critical visual tasks, with fast moving objects and players. It is important that the whole volume of the space is considered and that the quality of illumination is considered along with the colour and texture of materials. See Section 5 page 26 for reflectance levels of walls, floors and ceilings.

A good lighting system should provide adequate luminance, suitable brightness, contrast, uniformity of light distribution and satisfactory control of glare. It will also have a major influence on the overall ambiance of the hall.

It is vitally important that the roof / ceiling enclosure, lighting system and the layout of the court markings in a hall are designed together.

Many sports halls have to cater for a range of activities and some simultaneously where the sports hall can be divided into sections. There may also be a need to achieve adequate visual conditions for spectators. Non-sporting use may also be a requirement, for example on a school site the hall may be used for examinations and school plays. Where substantial variations in luminance are required, additional switching of supplementary lighting could be considered.

It is generally recommended that for multi sports halls, the lighting design is based on the requirements of the priority activities, whilst ensuring that, as far as practicable, all other potential activities are catered for. In most situations in England a lighting design that caters well for badminton, with courts running across the hall will be more than adequate for the sports that are played along the length of the hall. However a common enhancement is to provide an additional lighting system for cricket that can be controlled separately.

The key issues for lighting design can be summarised as:

- Illumination value (Eave) – minimum maintained average. The system should be designed with a higher initial value and for planned replacement of lamps when output falls below the Eave level
- Uniformity ratio (Emin/Eave) – the ratio of minimum to average illuminance over the playing area
- Colour rendering (Ra) an indication of the quality /distortion when compared to natural light.

For 34.5 x 20 m and 40.6 x 21.35 m sports halls:

A 500 lux lighting system that caters well for Badminton, with courts running across the hall, will be adequate for most sports that are played along the length of the hall.

However a switchable system should be considered:

- ***to improve the suitability for badminton, basketball and volleyball***
- ***to increase to 750 lux average and uniformity min / average of 0.8 over cricket nets.***

See separate Sport England guidance for variations between technical advice (such as BSEN 12193:2007 and CIBSE LG4) and requirements of National Governing Bodies for the priority sports in a particular project.

Daylighting

Any proposed use of daylight in a sports hall needs very careful consideration. There are likely to be technical issues that need to be weighed against the perceived benefits. These include:

- Controlling glare
- Stable and uniform levels of lighting
- Heat gain
- Local cooling.

The capital cost of incorporating daylight can be 2-3 times that of a plain wall or roof, and maintenance costs are likely to be increased. The

Light fittings suspended from main beams located between the badminton courts. Additional lighting for cricket nets.

inclusion of daylight is difficult to justify solely on economic grounds and amenity benefits should be considered.

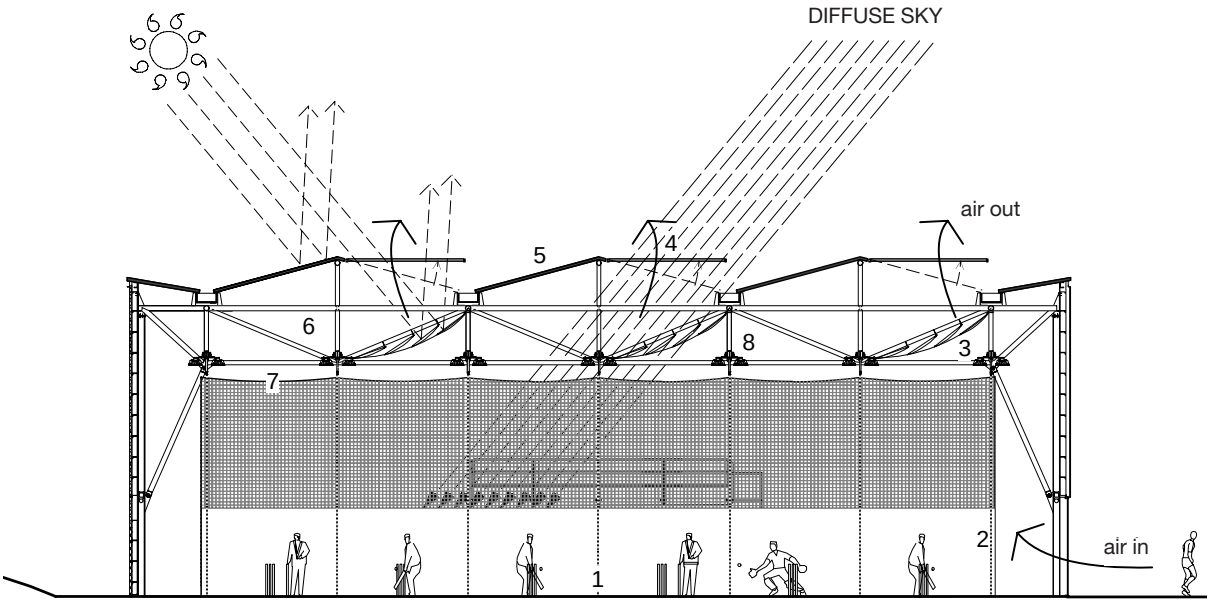
Some sports such as badminton, table tennis and gymnastics have strict advice against daylight in sports halls.

Small amounts of daylighting in say a rooflight or a side wall can create a sombre and dull internal atmosphere in the hall.

See Sports Scotland publication:

'Understanding Daylighting of Sport Halls' SSC

www.sportscotland.org.uk/ChannelNavigation/Resource+Library/



1 Playing area
2 Retractable tension nets
3 Roof blinds
4 Rooflight
5 Metal roof panels
6 Steel truss
7 Ceiling net
8 Artificial lights

Example of daylighting successfully integrated into an indoor cricket school with north facing roof lights and screens to prevent entry of direct sunlight

Acoustics

The internal acoustic conditions within a sports hall should be appropriate for its intended use. It will be beneficial to all users that the ambient noise levels are low and that verbal communication is easy and critically important for people with hearing impairment or learning difficulties. This is particularly important for training, teaching / learning situations, and activities that are accompanied by music.

Sports halls on school sites are required under the Building Regulations to comply with DfES Building Bulletin 93 : 2003 with respect to sound insulation, reverberation times and internal ambient noise levels.

Acoustic design is a complex and specialist subject that can be influenced by many factors. Requirements should be established early in the briefing and design process.

Key issues are covered below.

Reverberation times

The hard surfaces required to withstand impact damage within the sports hall tend not to have good sound absorbency properties and results in sound being repeatedly reflected from the various surfaces. This is exacerbated by the size and rectangular shape of sport halls. Technically this can be measured from the time that a given source of sound decreases by a standard amount and is referred to as the reverberation time (RT) [17].

Characteristics that can be attributed to excessive reverberation times include:

- Poor speech intelligibility
- High background noise levels
- Increase stress for users
- Management / control difficulties.

The greater the background noise the greater the need to shout leading to a spiral of increased noise. An appropriate RT is likely to give the users a more relaxed experience with less background noise, greater understanding of key communication and making speech clearer.

The problem can be avoided through acoustic design that integrates sound absorbent materials into the ceiling and/or upper wall levels.

See DfS Building Bulletin 93 : 2003 for a case study of remedial work to an existing hall to introduce a pattern of sound absorbent slots and acoustic quilting into an existing timber ceiling.

Ceilings provide the best opportunity for the provision of acoustic absorbency. They are often the underlining of the roof, which is usually a sandwich construction that can have a perforated self decorated metal finish. However additional sound absorption material on the side walls is likely to be required to achieve good acoustic conditions. This should be formed with a suitably robust lining material.

Sound insulation

The level of sound insulation within the building fabric to prevent distracting sound from external sources being transmitted into the hall should also be considered. Heating and ventilation equipment should be specified to minimise background noise and similar attention should be given to openings in the building. A standard of NR40 would normally be specified.

In some situations the noise that may be emitted from a sports hall may also be an issue.

Sports hall acoustics:

- ***Reverberation times should be between 1.5 and 2.0 sec at mid-frequency***
- ***Sound insulation standard should be capable of a minimum of NR 40.***

[17] See ISO 354 and BS EN ISO 140-7: 1998 for standard and test methods.

7.0 External sports facilities

Where site dimensions permit it is advantageous to include a floodlit and fenced multi use games area close to the hall. These tennis court, or larger, sized facilities can significantly increase overall use and can reduce wear and tear in the sports hall. Overall changing capacity will have to be increased according to the capacity of the play area and some secure external equipment storage must be provided. Artificial pitch areas will require paved routes connecting with the halls main or secondary entrance, arranged so that staff can supervise the changing to play area route.

The same criteria will apply to tennis or netball courts but grass pitches and cricket squares require separate changing rooms with field exits. Site planning should be arranged so that routes to grass and artificial pitch areas do not cross or coincide. In centres with extensive outdoor provision a pavilion, suitably orientated for external viewing and located for servicing, could be provided.

An adjacent artificial grass pitch can complement a sports hall and be an economical way to provide additional booking capacity

Appendix 1

Standard multi-sport halls

Four court hall

The recommended minimum size for a multi-sports hall is nominally 34.5 x 20.0 x 7.5 m.

The new dimensions allow an increased range of sports at various levels of play. For example:

Badminton:	club
Basketball:	club/community/training
Cricket (4 lanes)[18]:	community / training
Gymnastics:	training
Five-a-side football:	club
Futsal:	club
Handball:	community
Korfball:	community
Netball:	community / training
Volleyball:	premier / training

The benefits can be summarised as follows:

Length (34.5 m)

- The length of the hall allows division nets to be installed in two locations between the badminton courts. This could extend the programme of use of the hall to include a range of additional sports activities such as short mat bowls, gymnastics, table tennis and martial arts which can be played concurrently with some of the other main sports noted above. (See following diagrams).
- The length accommodates the preferred length for cricket nets of 33.62 m.
- The length allows a full length netball court with reduced end runoff zones of 2.0 m that are the recommended minimum for community level play and training.

Width (20.0 m)

- The width can allow the 4 badminton courts to to be offset to allow some circulation space and seating for informal viewing.
- Two volleyball training courts can be accommodated across the width and can be integrated with practice basketball goals on the side walls (but with limited space for cricket).
- The netball court can be offset to allow a 1.75 m margin along one side and a minimum recommended side runoff of 1.5 m for community level and training.
- Basketball benefits from the increased width to allow full side margins or, alternatively, the minimum side margins plus more space for officials.
- The width allows 4 cricket nets and a central zone for roof mounted drop-down basketball goals.
- The width is helpful for sports requiring a smaller amount of space. For example, a full-length fencing piste, short mat bowls carpet and up to four table tennis tables can be accommodated across the width of the hall.

Height (7.5 m)

- The height allows badminton to be played at club level, and volleyball to be played at premier level. The 7.5 m clear height should be achieved across the entirety of the hall.

General

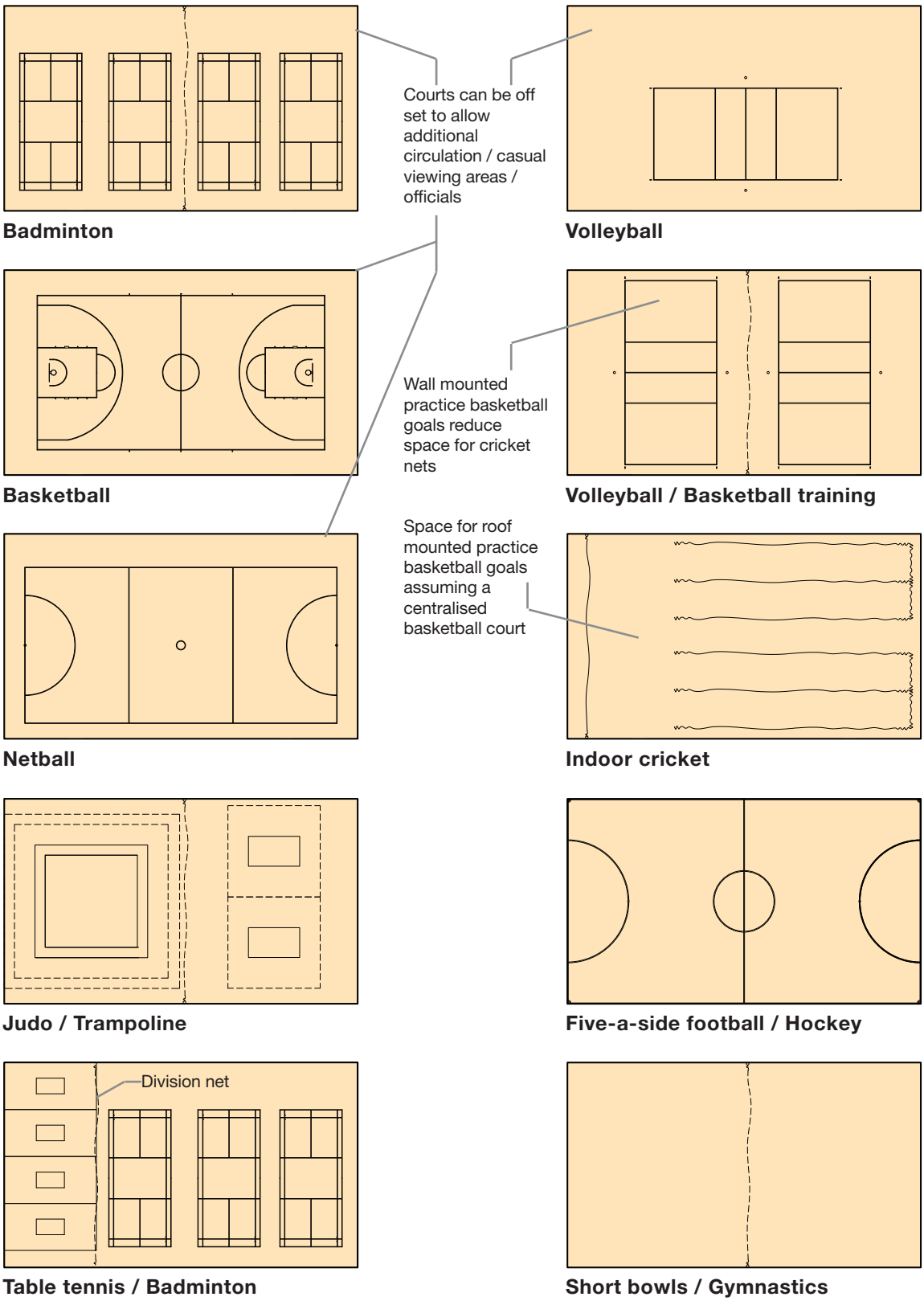
- See pages 43-52 for detailed court information for the individual sports.
- The cricket nets and hall division netting can be stored in wall bags outside the critical play areas for most sports. However, for five-a-side football which utilises the whole space, nets must be hoisted above 1.21 m (NB. Cricket and division nets require extra height to avoid conflict with the clear height requirement).
- Generally it is preferable to locate the access and exit points on the longer sides of the hall and to relate these to the circulation space within the hall (see notes on the diagrams for offset courts).
- The positions of door openings and viewing panels should be positioned to avoid conflict with the court layouts.

The 34.5 x 20 x 7.5 m hall provides additional space for teaching school PE and coaching

(particularly when the hall is sub-divided into two sections).

[18] Four cricket lanes are possible with centrally located basketball court and goals but without basketball training goals on the side walls.

Four-court hall (Cont/d)



Court layouts for a nominal 34.5 x 20.0 x 7.5 m four-court hall

Five court hall

The additional space within a 5 court hall allows more activities to take place consecutively and creates further areas of bookable space. It also allows more sports to be accommodated, higher levels of competition to be hosted and greater flexibility for teaching and coaching.

The recommended size for this multi-sports hall is nominally 40.60 x 21.35 x 7.5 m.

Additional sports

Badminton	(one additional court - see note below)

Other benefits

Basketball	(more space for officials and team benches)
Cricket	(more space for bowlers run up and fielding practice)
Gymnastics	(more space for training)
Five-a-side football	(more space for larger court)
Futsal	(more runoff space for premier level of play)
Handball	(more runoff space for premier level of play)
Netball	(more runoff space for club level of play)
Volleyball training	(more run off space)

General

See pages 43-52 for detailed court information for the individual sports.

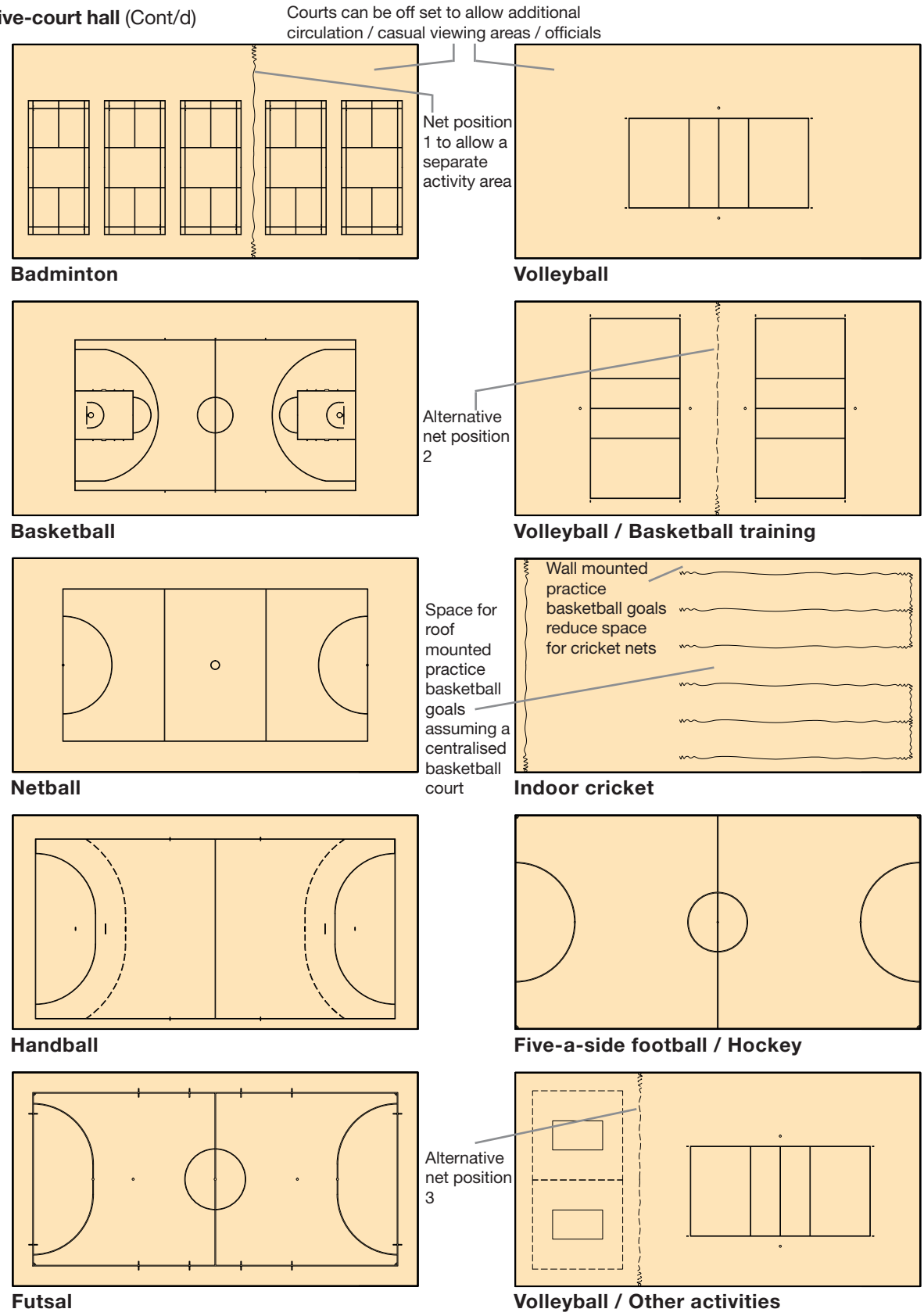
See general notes on four court hall for:

- cricket / division netting storage bags
- clear height under tracking
- access and exit points
- circulation space within the hall
- door openings and viewing.

The 40.6 x 21.35 x 7.5 m hall provides additional space for teaching school PE and coaching

(particularly when the hall is sub-divided into two sections).

Five-court hall (Cont/d)



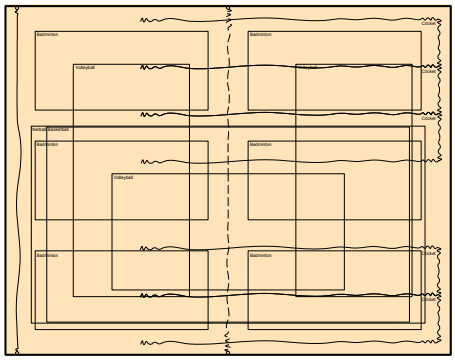
Court layouts for a nominal 40.6 x 21.35 x 7.5 m five-court hall

Six court hall

The 34.5 x 27.0 x 7.5 m 6-court hall creates two team sports zones or a competition play area aligned with spectator seating. This 3 + 3 badminton court arrangement is recommended in preference to the 4 + 2 layout (33 x 27 m hall) originally used for this hall size. The 34.5 m length provides the required safety margin behind the badminton courts.

Notes

- Align structure between badminton courts to provide three full-span bays or introduce a primary beam across the centre of the hall.
- Division netting is hung between the three rows of courts. It can also be considered between two end courts but this zone is usually designated for retractable seating.
- A height of 9.0 m and extra length is required for Premier standard badminton.
- Two standard basketball courts or two reduced five-a-side football courts can be laid across the hall.



Court layouts for a nominal 34.5 x 27.0 x 7.5 m six-court hall (3 + 3 court arrangement)

Larger hall configurations

Larger sports halls can be conveniently organised as multiples of the layout for 4, 5 and 6 court halls that are described on the previous pages (see pages 6, 38 and 40).

This gives an efficient method of organising the court markings and the subdivisions of the space with dividing nets / screens to deliver a multi-sport programme.

These larger halls can also provide space for a range of show courts to be overlaid and spectator accommodation as may be required for higher levels of play and sporting events. In effect, such halls can operate as a small indoor arena [19]. However, careful consideration needs to be given to the many implications. For example:

- The strategic case for such a facility and the national facilities strategies for the particular sports that are being considered.
- The business, operational and design implications such as the requirements of NGBs, sponsors and TV companies.
- Technical issues regarding the health and safety, fire escape and general welfare of the spectators and associated accommodation.
- Additional safety zone and height requirements for the higher levels of play for the sports concerned.

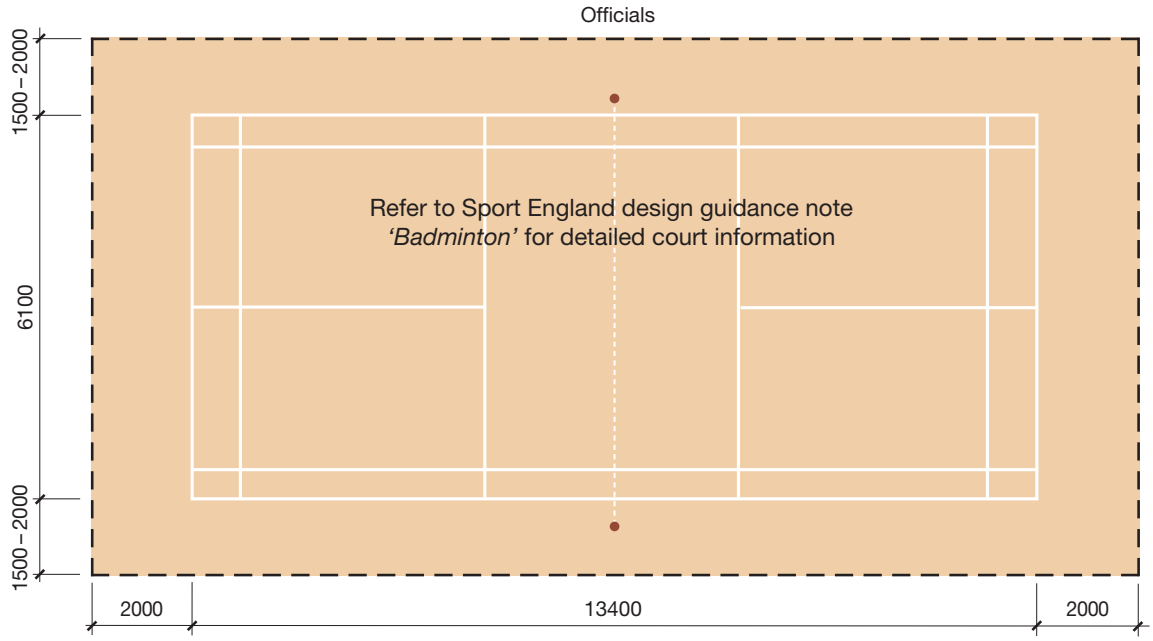
See Sport England publication *'Developing the Right Sports Hall'*.

[19] See *Arenas: A Planning, Design And Management Guide* - Sports Council 1998.

Appendix 2

Court dimensions

Badminton



Dimensions of a badminton court (mm)

	Community	Club	Premier	International
Minimum height over court	6700	7500	9000	9000
Playing area (doubles court)				
Length	13400	13400	13400	13400
Width	6100	6100	6100	6100
Wall from baseline, min	2000	2000	2000	2000
Between opposing courts including division netting	3000	3000	4000	4000
Wall from sideline [1]	1500	1500	1500	2000 [2]
Between parallel courts, min	1500	1500	1500	2000
Between parallel courts including division netting	2400	2600	2600	3000
Minimum overall area:				
For a single court	17400 x 9100	17400 x 9100	17400 x 9100	17400 x 10100
For two parallel courts [3]	17400 x 16700	17400 x 16700	17400 x 16700	17400 x 18200
For each additional court [3]	17400 x 7600	17400 x 7600	17400 x 7600	17400 x 8100

Notes:

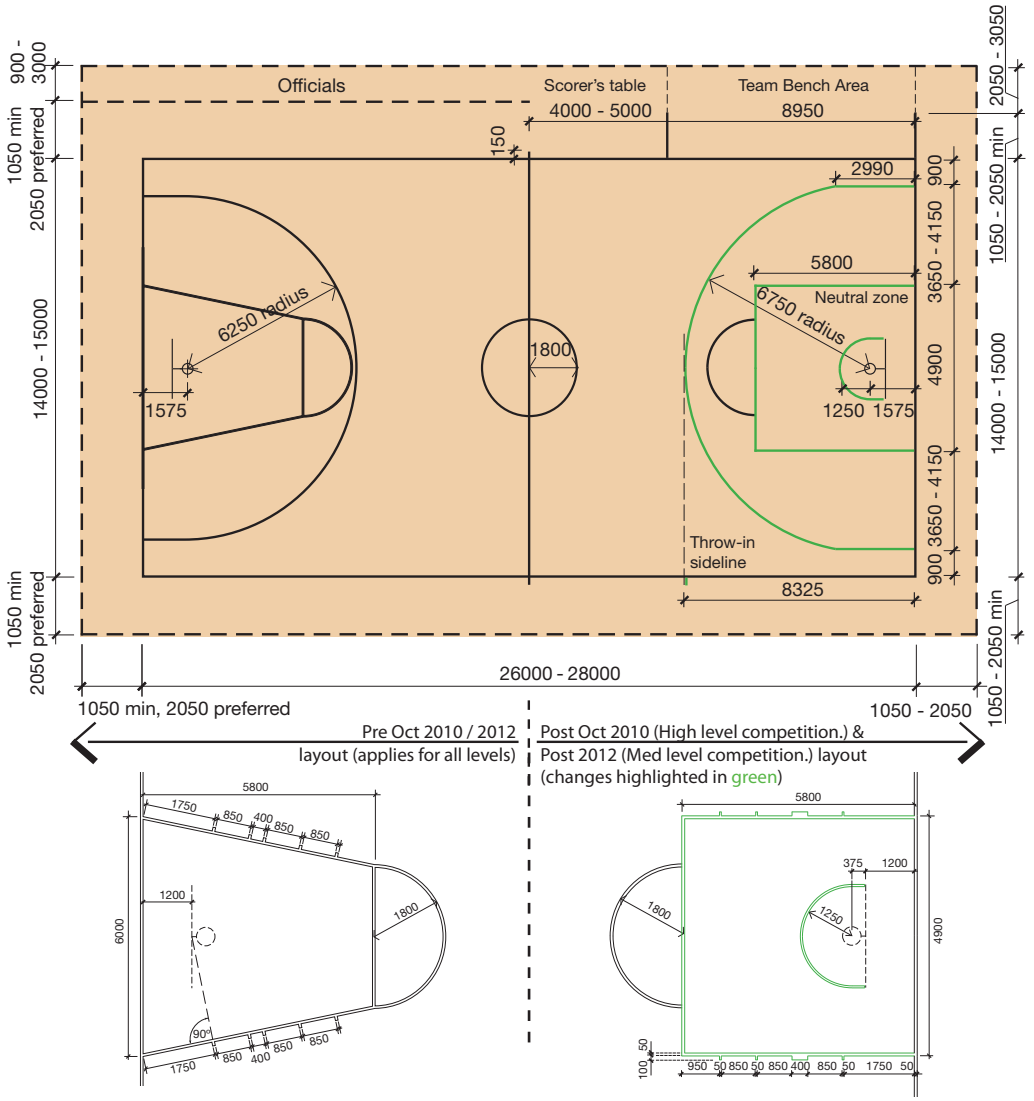
[1] To accommodate umpire chairs an additional width may be needed between court sides outside of safety run off.
[2] Excludes space for officials tables or division netting.
[3] Excludes division netting.

www.badmintonengland.co.uk

Refer also to Sport England design guidance note *'Badminton'*.

Badminton space requirements (mm)

Basketball



Dimensions of a basketball court (mm)

	Community	Club	Premier	International
Playing area				
Length (minimum or preferred)	26000 or 28000	26000 or 28000	26000 or 28000	28000
Width (minimum or preferred)	14000 or 15000	14000 or 15000	14000 or 15000	15000
Out of bounds (minimum or preferred)	1050 or 2050	1050 or 2050	2050	2050
Extra one side for officials and team areas / benches	Optional	2050 - 3050	2050 - 3050	3050
Overall space requirements				
Minimum Preferred	28100 x 16100 32100 x 19100	28100 x 18150 32100 x 22150	30100 x 20150 32100 x 22150	32100 x 22150[4]
Height	7000	7000	7000	7000

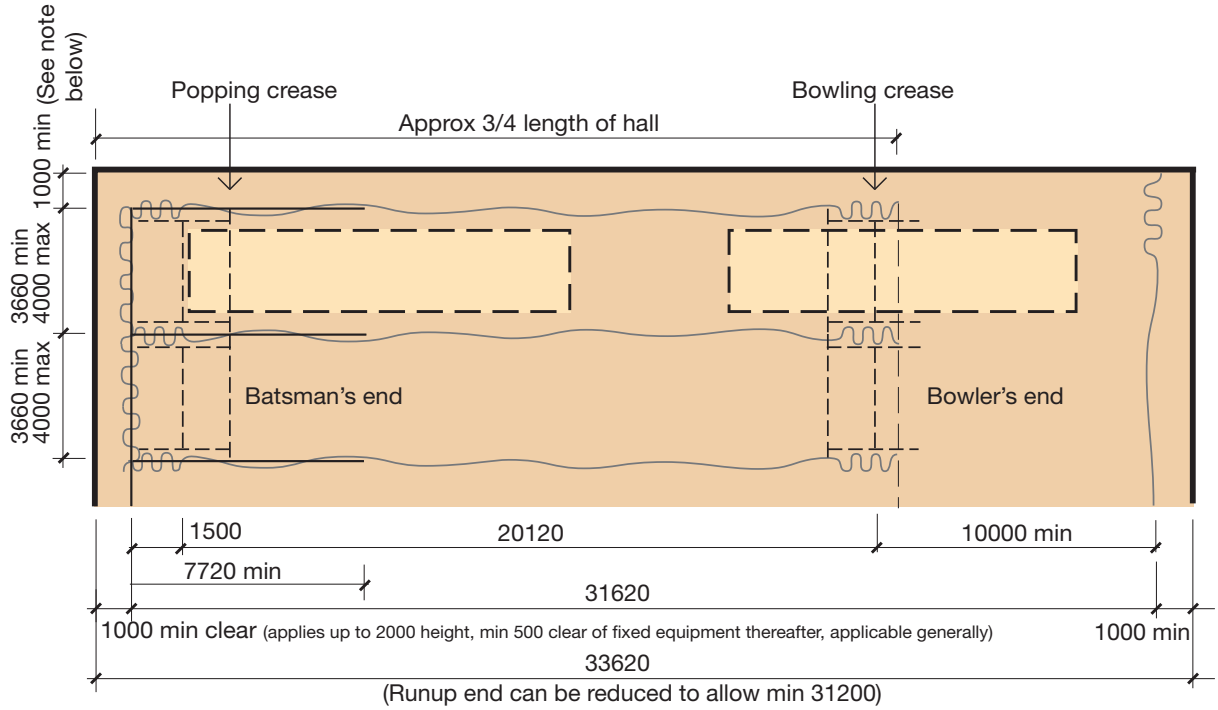
Notes:

[1] Provision for spectator seating has been excluded
[2] 34.5 x 20 m sports halls can accommodate the preferred size court 28 x 15 m for club / community / training level use.
[3] Markings in green are changes from Oct 2010 (high level competition) and 2012 (medium competition).
[4] For international events, EBL recommend min 5.0 m additional safety zone in front of spectator seating.

www.englandbasketball.co.uk

Basketball space requirements (mm)

Cricket practice / Indoor cricket



Roll-out mats (if required)
Batting ends - 11220 x 2000 (10000 in front of popping crease)
Bowling ends - 10000 x 2000 (6000 behind bowling crease, 4000 in front)

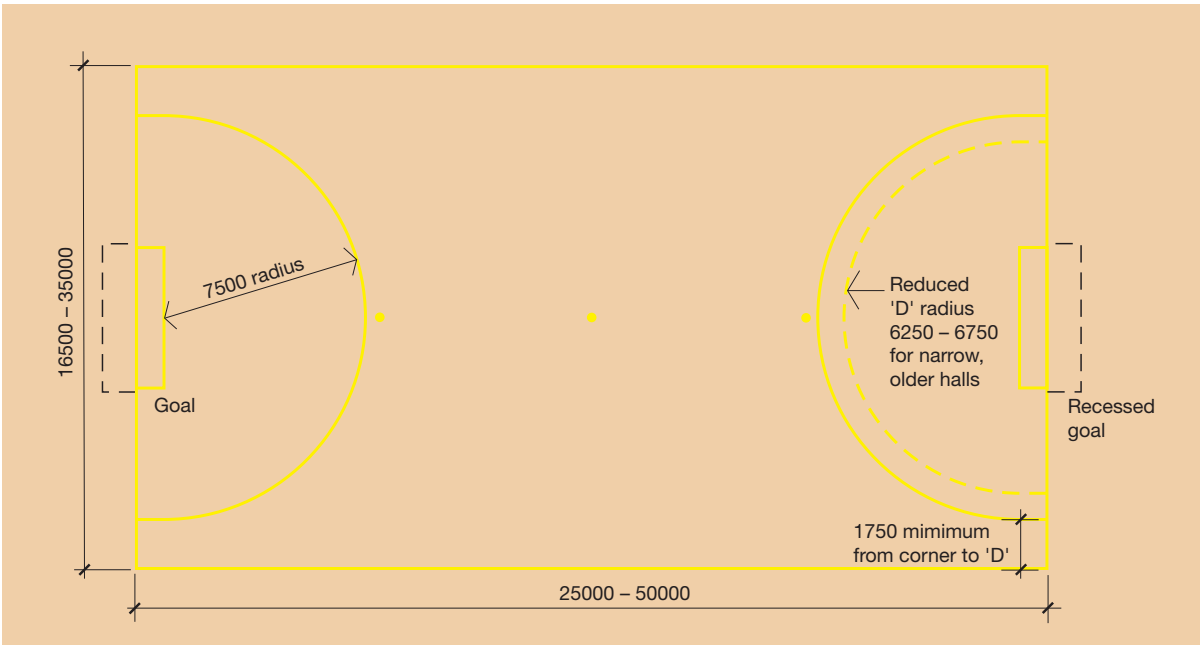
Dimensions for indoor cricket (mm)

	Minimum	Recommended maximum
Length	31200	33620
Width	3660	4000
Height of horizontal top net	4500	5000
Height of underside of loft net	4000	
Safety margin surrounds	1000 (clear) - subject to projection of fixed equipment from wall e.g. basketball practice hoops	

Indoor cricket space requirements (mm)

See ECB Facility Briefs and Guidance Note *'Indoor Sports Halls with Cricket Provision (TS3)'*.

Five-a-side football



Dimensions of a five-a-side football pitch (mm)

	Community	Club	Premier	International
Playing area				
Length (min - max)	25000-50000	25000-50000	25000-50000	25000-50000
Width (min - max)	16500-35000	16500-35000	16500-35000	16500-35000
Out of bounds surround	N/A	N/A	N/A	N/A
Overall space requirements	For sports halls, walls may be used (where safe) as the court boundary, or rebound boards may be provided. There are no run off requirements.			
Height	No prescribed minimum height [1]			

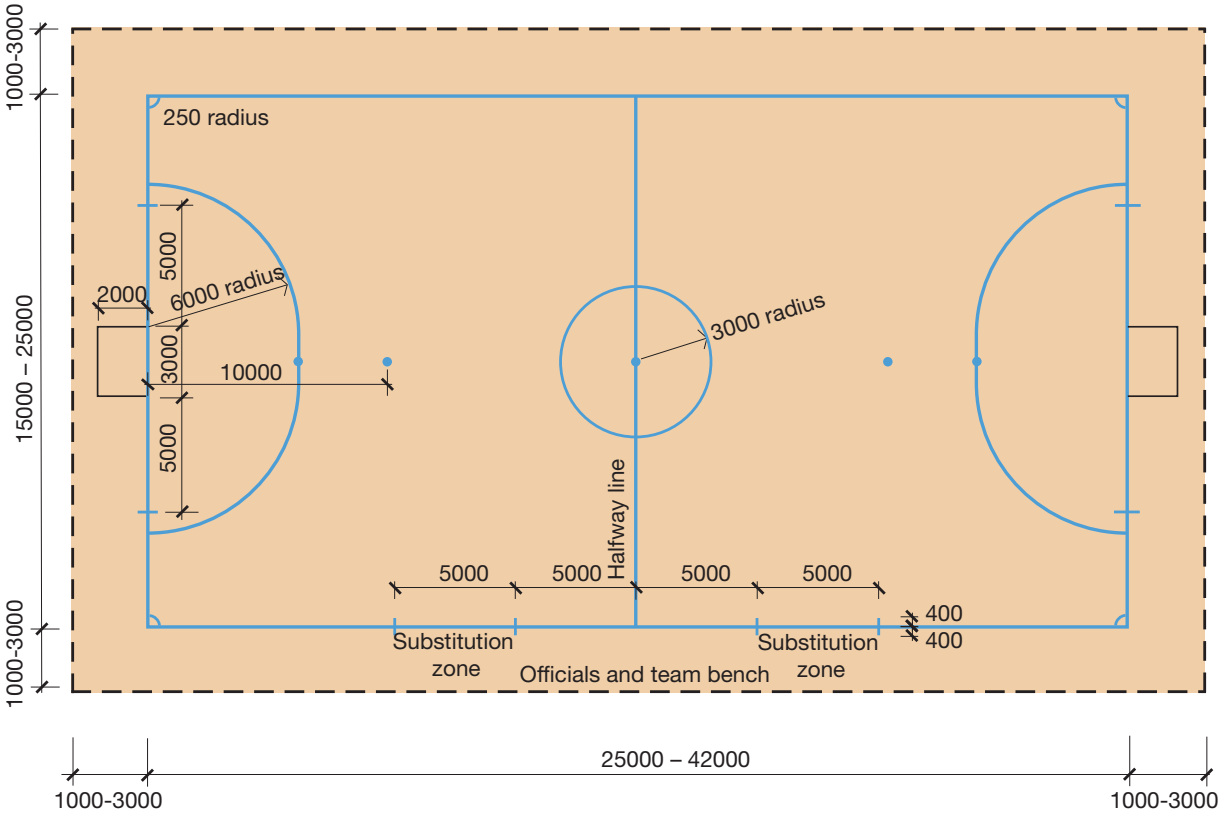
Notes:

[1] No specific minimum height is given. Height provision is driven by other sports using the space (e.g. Badminton, Gymnastics, and Tennis etc). Wall surfaces used as boundaries must be impact resistant, smooth, with finishes to prevent dusting / flaking. There must be no protrusions and doors should be avoided or be flush and open outwards away from the sports hall.

www.thefa.com

Five-a-side football pitch space requirements (mm)

Futsal



Dimensions of a futsal pitch (mm)

	Community	Club	Premier	International
Playing area				
Length (min - max)	25000-31000 [1]	31000-42000 [1]	31000-42000	38000-42000
Width (min - max)	15000-16000	16000-25000	16000-25000	18000-22000
Run off surround	1000	1000-2000	2000-3000	3000 [2]
Overall space requirements Minimum Maximum	 27000 x 17000 33000 x 18000	 33000 x 18000 46000 x 29000	 35000 x 20000 48000 x 31000	 44000 x 24000 48000 x 28000
Height	No prescribed minimum height [3]			

Notes:

[1] The side walls or rebound boards are not used in Futsal and a runoff is a requirement. For recreational and club levels of play the court sizes and runoffs can be adjusted to allow Futsal to fit into a four court Sports Hall, otherwise the preferred run off of 3m is required for national and international play. However, this may be reduced to 2m where space is limited.

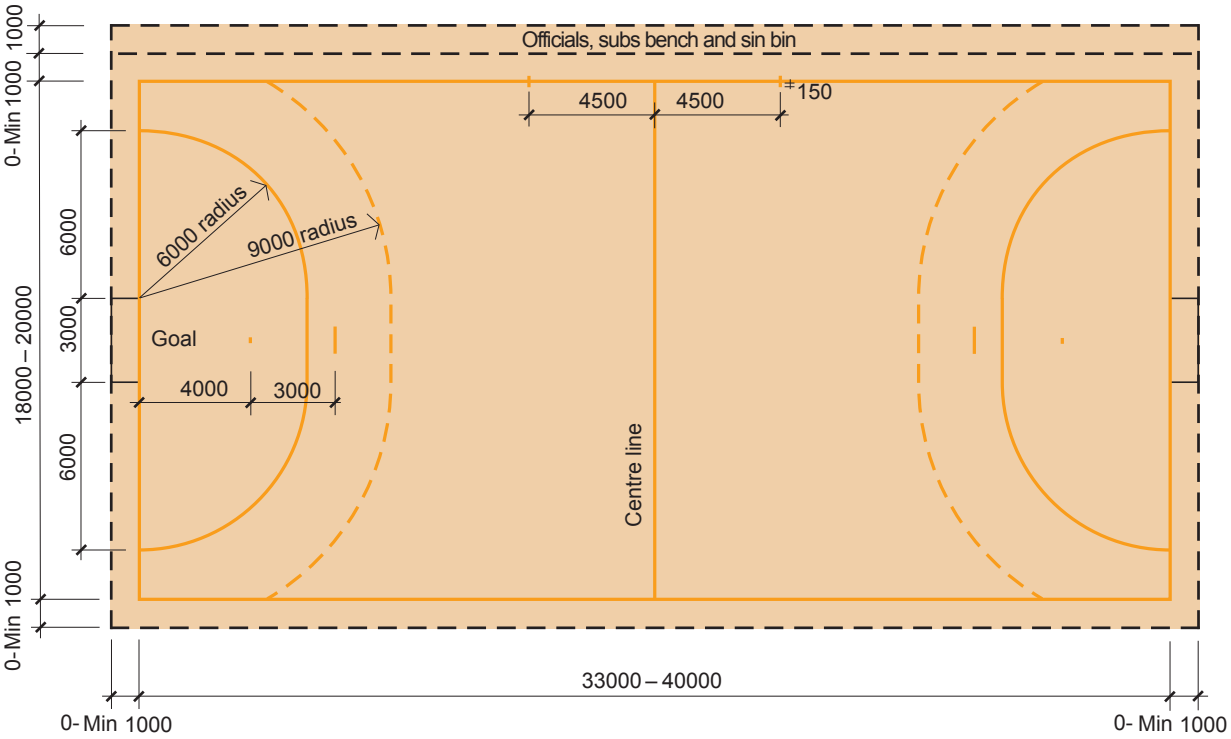
[2] Additional space is required for benching / tables / officials / team bench.

[3] No specific minimum height is given. Height provision is driven by other sports using the space (e.g. Badminton, Gymnastics, and Tennis etc).

http://www.fifa.com/aboutfifa/footballdevelopment/technicalsupport/futsal/lawsofthegame.html

Futsal pitch space requirements (mm)

Handball



Dimensions of a handball court (mm)

	Community	Club	Premier	International
Playing area				
Length (minimum - preferred[1])	33000-40000 [2]	36000-40000	36000-40000	40000
Width (minimum - preferred[1])	18000-20000	18000-20000	18000-20000	20000
Out of bounds surround	0-1000	1000 min	1000 min	1000 min
Extra one side for officials and team areas / benches	N/A	1000	1000	1000
Overall space requirements				
Minimum Preferred (min)	33000 x 18000 42000 x 22000	38000 x 21000 42000 x 23000	38000 x 21000 42000 x 23000	42000 x 23000
Height	7000	7000	7000	7000

Notes:

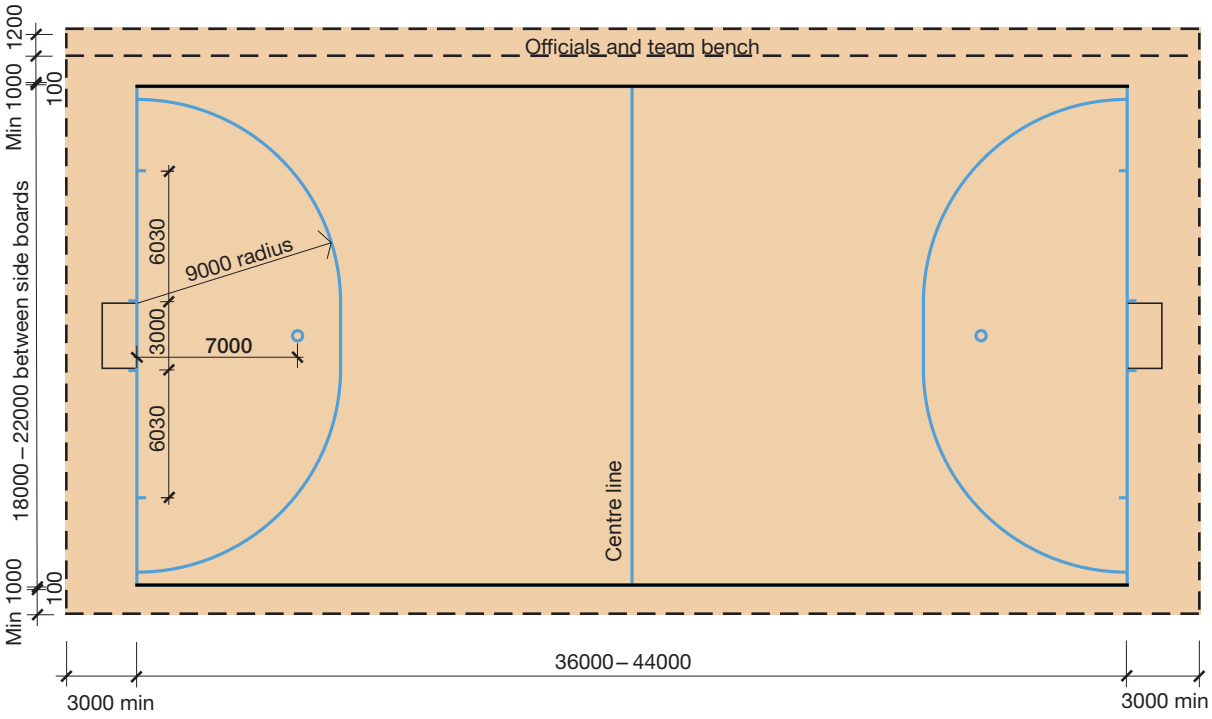
[1] Preferred court sizes should be provided whenever possible as playing on undersized courts presents difficulties. Reduced sizes will fit in standard 4, 5, 6 or 8 court halls while preferred sizes will fit in standard halls with 9 courts and above.

[2] The hall walls can be used as the court limit where space is limited and mini handball courts (20 x 13 m) can be suitable at community level of play. In both cases, safety runoffs are beneficial but not a requirement provided boundaries are impact resistant, smooth, with finishes to prevent dusting/flaking. There must be no protrusions and doors should be avoided or be flush and open outwards.

http://britishhandball.worldhandball.com

Handball space requirements (mm)

(Indoor) Hockey



* Court width is measued between 100mm side boards. Court length is measured overall backlines/side boards. Safety run off is measured outside the side boards/back lines.

Dimensions of an indoor hockey pitch (mm)

	Community	Club	Premier	International
Playing area (2:1 l/w ratio)				
Length (minimum - preferred) (including back lines)	36000-44000	36000-44000	36000-44000	36000-44000
Width (excl.100x100mm side boards)	18000-22000	18000-22000	18000-22000	18000-22000
Run out behind back lines	3000	3000	3000	3000
Clearance outside side boards	1000	1000	1000	1000
Extra one side for officials and team areas / benches	N/A	1200[2]	1200[2]	1200[3]
Overall space requirements				
Minimum Preferred	42000 x 20200 50000 x 24200	42000 x 21400 50000 x 25400	42000 x 21400 50000 x 25400	42000 x 21400 50000 x 25400
Height [1]	No prescribed minimum height			

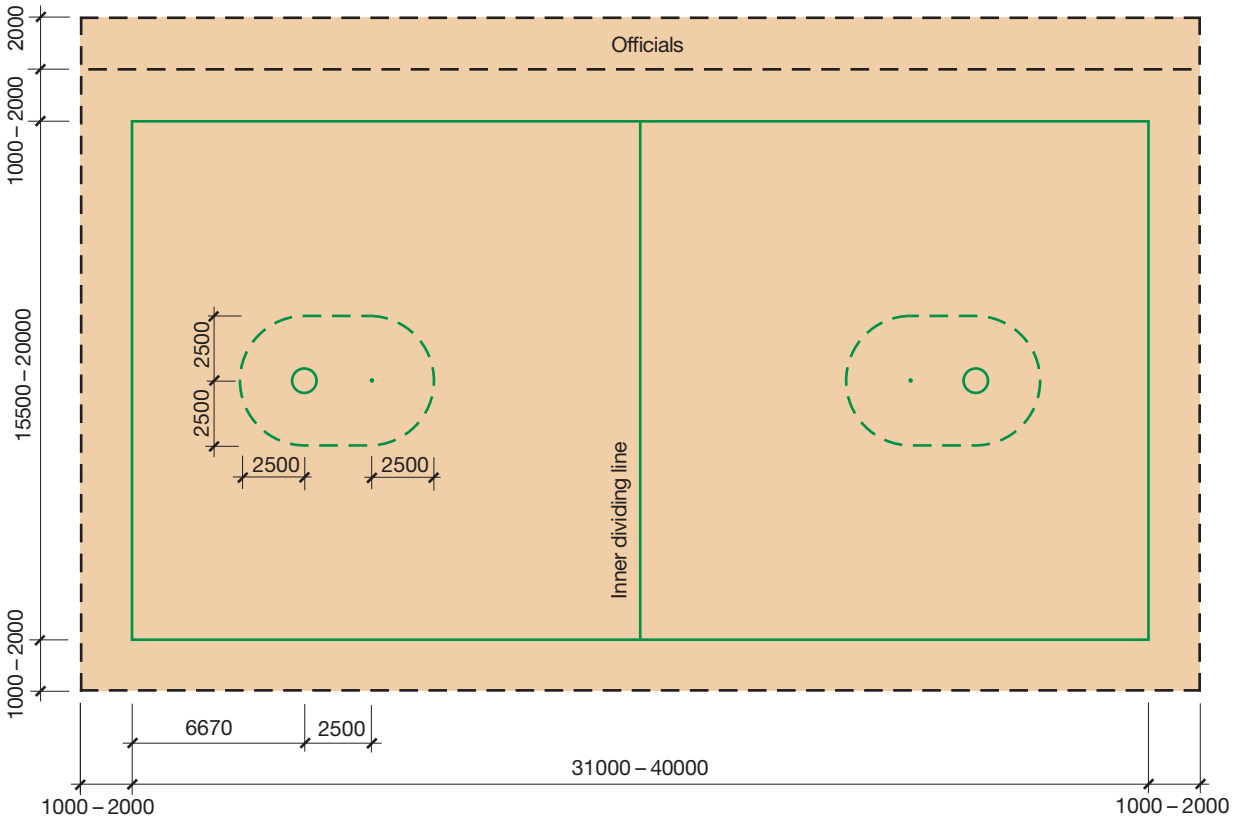
Notes:

[1] No specific minimum height is given. Height provision is driven by other sports using the space (e.g. badminton, gymnastics, and tennis etc).

www.englandhockey.co.uk

(Indoor) Hockey space requirements (mm)

Korfball



Dimensions of a korfball pitch (mm)

	Community	Club	Premier	International
Playing area [1]				
Length (minimum - preferred)	31000-40000[2]	36000-40000	36000-40000	40000
Width (minimum - preferred)	15500-20000	18000-20000	18000-20000	20000
Side margins [3]	1000-2000	1000-2000	2000	2000
Extra one side for officials and team areas / benches	N/A	2000	2000	2000
End margins	1000-2000	2000	2000	2000
Overall space requirements				
Minimum Preferred	33000 x 17500 44000 x 24000	40000 x 24000 44000 x 26000	40000 x 24000 44000 x 26000	44000 x 26000
Height (min-preferred)	7000-9000	9000	9000	9000

Notes:

[1] Court length to width ratio must be 2:1.

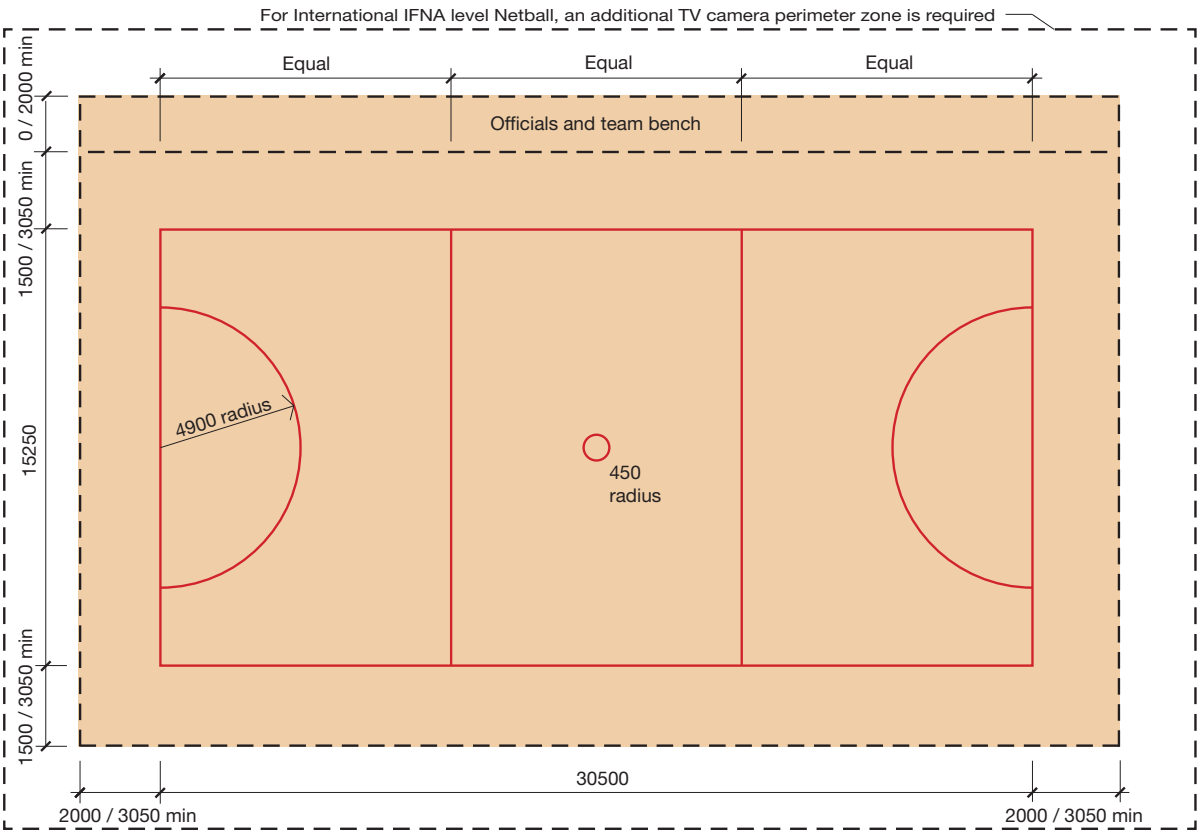
[2] Sizes vary as necessary to fit a 4 and 5 court hall and can accommodate from community to premier levels of play.

[3] 1 m run off widths for community level of play and training. Otherwise a 2 m run off width is to be provided.

www.korfball.co.uk

Korfball space requirements (mm)

Netball



Dimensions of a netball court (mm)

	Community	Club	Premier	International [1]
Playing area				
Length	30500	30500	30500	30500 per court
Width	15250	15250	15250	15250 per court
Side margins, min	1500 [2]	3050 [2]	3050 [2]	3050 [2] + TV camera zone
Extra one side for officials and team areas / benches	Optional	Optional	2000min	2000min
Margin space behind goal lines, min	2000	3050	3050	3050 + TV camera zone
Overall space requirements [3]	34500 x 18250	36600 x 21350 min	36600 x 23350 min	44600 x 36600 min + TV camera zone
Height (min)	7500	7500	7500	8300

Notes:

[1] For International courts to IFNA standards, a practice area will be required close to the competition area - see Sport England's publication *'Developing the Right Sports Hall'* and *'Netball Data Sheets'*.

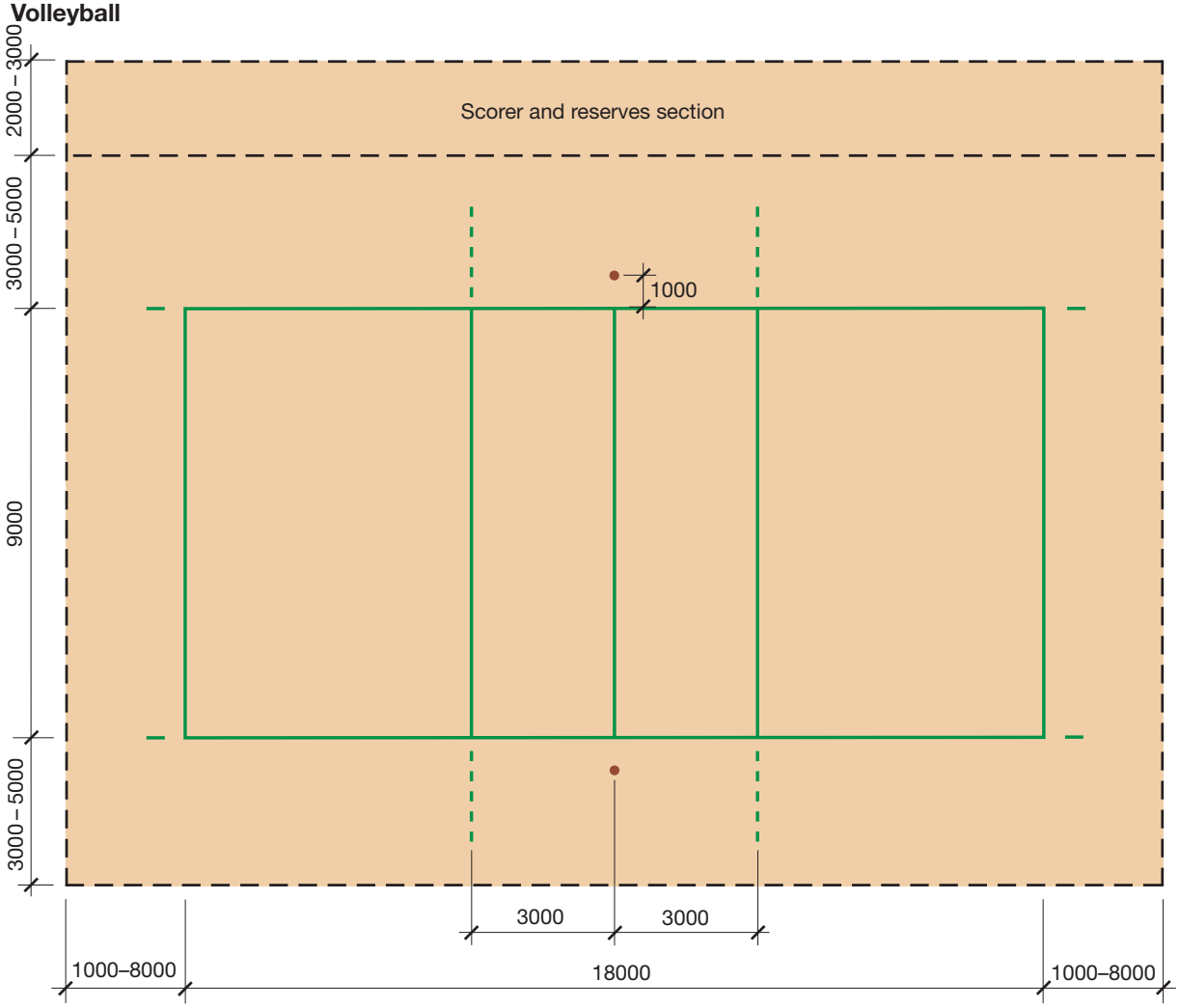
[2] Where courts are laid side by side with no division or change in surfacing a common run off of at least 4 m is to be used in lieu of minimum requirement of 3.05 m.

[3] Where the full overall space requirements cannot be met, the safety margins can be reduced for Club and Community levels of play, subject to an appropriate risk assessment and agreement with England Netball.

www.englandnetball.co.uk
www.netball.org
www.englandnetball.co.uk/The_Game/Facility-and-Court-Information/

Netball space requirements (mm)

Volleyball



Dimensions of a volleyball court (mm)

	Training [1]	Community	Club	Premier [2]	International [3]
Playing area					
Length	18000	18000	18000	18000	18000
Width	9000	9000	9000	9000	9000
Side line clear space	3000	3000	3000	3000	5000 min
Extra one side for officials and team areas / benches	N/A	N/A	2000	2000	3000
Backline clear space	1000	3000	3000	5000	8000 min
Overall space requirements	20000 x 15000	24000 x 15000	24000 x 17000	28000 x 17000	34000 x 22000 min
Height (min)	7000	7000	7500	7500	12500

Notes:

[1] The principles of the Volleyball training court have been proposed by Volleyball England and incorporates reduced end run-off margins, subject to risk assessment on a site-by-site basis.

[2] Sizes refer to National League play competition.

[3] Sizes refer to FIVB governed World / Official competition

www.volleyballengland.org

Volleyball space requirements (mm)

Alternative languages and Formats:

This document can be provided in alternative languages, or alternative formats such as large print, Braille, tape and on disk upon request. Call the Sport England switchboard on 08458 508 508 for more details

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User Guide

Before using this guidance for any specific projects all users should refer to the User Guide to understand when and how to use the guidance as well as understanding the limitations of use.

Click here for **'User Guide'**

Click here for current **'Design and Cost Guidance'**

Issue Tracker

005 - Amendments to align with *'Developing the Right Sports Hall'* publication: February 2012
004 - Minor Amendments to sports hall / wc layouts and basketball appendix layouts: February 2011
003 - Minor Amendment to Page 24: April 2010
002 - Updated and Amended Combined Publication: March 2010
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