Sports Halls: Design
Introduction

This Guidance Note covers the design and planning of multi-sports halls and their attendant accommodation. Badminton is the sport which has the most influence over the design of halls and is used as an easy reference to their size as being of 4, 6, 8, 9, 12 or more courts. It is frequently the most popular activity, has the smallest court module and the most critical lighting and background colour requirements. Full details of hall layouts and their sports capacity can be found in a separate guidance note.

For sports halls to be successful they must provide an environment that people enjoy, while at the same time meeting the functional needs of users. It is essential that they have sufficient appeal to compete with shopping malls, restaurants, cinemas and other leisure attractions.

Finally, quality. Sports halls are open for long hours, seven days a week and take heavy wear as a result. It is therefore essential to build a high quality building with good, easily maintained finishes.

It is far better to design a smaller building of the right quality, with potential for later expansion, than a larger building of poor initial quality.

Site planning

Location

The shape and contours of the available site will obviously influence the siting of the sports hall and any important ancillary facilities, for example artificial turf pitches or 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 bays with ramped curbs
- access and adequate turning provision for service vehicles
- secure cycle standing located within sight of an 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.

A planting scheme will assist in linking the building to its surroundings and in urban projects can help to create a more welcoming appearance to the entrance environment. Suitably selected shrub planting will provide a barrier to the building face deterring vandalism and giving more privacy and security to glazed accommodation. All new planting will need initial barrier protection.

Planting schemes are covered in detail in a separate guidance note.
External appearance

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

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 too can often lead to a heavy and oppressive character. To summarise, sports halls should have:

- a clearly identified entrance of appropriate scale
- a well-articulated structure
- good signage
- crisply detailed, high quality cladding and roofing materials.

All the above with skilful use of colour and good landscaping will help to create an attractive and welcoming sporting image.

Hall and centre planning

Different sizes of hall have different support accommodation requirements. They are often combined with other activity spaces, pools, rinks or other leisure facilities when the term hall is subsumed into the general title of a sports or leisure centre.

Each location has its own requirements, but every freestanding sports hall will 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
- cleaner's store.

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

- creche
- club meeting room
- fitness equipment room
- multi-purpose secondary hall or exercise studio
- staffroom
- physio treatment room
- licensed lounge
- all-weather external playing area.

Sports halls must 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 with social-refreshment area leading on to changing and toilets, to activity spaces and then back through changing. 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 must have direct or easy access to the building exterior and an ambulance bay.

All levels must be capable of being accessed by the disabled user via a lift or hoist as even the smallest sports hall with a minimum amount of support accommodation will have a floor area of at least 700m². Sports wheelchairs require 1m wide doorsets so the extent of their access routes must be carefully considered at the outset of design and can extend from the hall to changing, toilets and into social areas.

When locating the building on the site, remember to allow space for future expansion when the opportunity exists. The popularity of specific sports and the need for social accommodation will change over the life of the building and past experience shows that sports-dimensional and safety requirements can increase along with user expectations for better equipped and more comfortable support accommodation.
A four-court sports hall with the standard range of accommodation. An interpretation of a popular layout but with the sports hall designed to meet current recommended dimensions, improved changing standards and a larger fitness studio. Alternatively, the club–meeting room space could be developed as a creche, soft play or licensed area.
Main entrance

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

- a convenient and secure store for pushchairs overlooked from reception
- a draft lobby to the main entrance doors
- automatic operation of the main doors which is particularly helpful to disabled users and people with young children.

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 the right atmosphere. The volume of space is important — it needs to relate to the volume of the sports hall beyond and low ceiling heights can often make the space feel very tight and unwelcoming.

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. A secondary benefit is that heavy usage of the entrance and associated social area can be reduced, allowing better quality and more attractive finishes to be specified.

Large centres with a mix of ‘dry’ and ‘wet’ facilities. Events centres will have more generous foyers and, where there are ice rinks or other specialised facilities, separate entrances will be provided for peak time admission.

Entrance and foyer arrangements
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.
- Incorporate storage for lost property and items for sale or hire.
- Make provision for the monitoring of fire and security systems.
- Allow for possible use of CCTV monitors.

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.

The reception and office accommodation should be closely linked but in larger centres an island reception may be used to separate the hall from pool or rink users or from spectators. These isolated counters usually require an integral cashing up office.

Whenever possible plan offices to be located on an external wall to allow for daylighting and views over the approach to the building.

The minimum administration required for a small hall or for a school with community sports use is:
- one office for a single occupant plus records storage.

Generally, four-court halls will justify:
- manager’s office with meeting space
- general office, unless some administrative functions take place off-site.

Larger centres may include:
- separate catering manager’s office
- other specialist accommodation
- restroom
- male and female staff changing.

Circulation arranged as a central street. Ideal for centres of all sizes, offering clear access, easy supervision and viewing of sports spaces.

Reception leading directly in to a central foyer and refreshments area – the most welcoming introduction to a sports centre.
Social and viewing areas

Every sports hall should be capable of being viewed from social accommodation and every hall with public use, including those on school sites, must 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.

Cafe areas 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 they can be grouped together and will include:
- a bar and lounge
- viewing into the hall and other areas.

Where it is not possible to accommodate these facilities at ground floor level, the social areas must be visible from the foyer and linked to it with a prominent staircase set in a generous well. It is most 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.
- 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.
The sports hall

Design

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

- Surfaces must be flush and of a consistent colour — there is no scope for applied design features. A successful interior must 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. This subject is covered in detail in a separate guidance note.

Structure

- Columns and beams must be laid out so that they run between the badminton courts. This allows the beams to carry light fittings between the courts and the hanging of division netting.
- Columns can be within, or partly within, external walls or outside the building envelope. They must never project into the hall.
- Additional structure may be required to support specific items of fixed equipment.
- Curved cellular beams are an economical form of roof structure and provide an elegant and functional interior by enabling the avoidance of a ridge.
- Z-purlins should be avoided when possible in favour of a deck spanning between the main beams. When Z-purlins are used they must be painted white to blend with the roof decking.
Floor
An area elastic floor is the critical element in providing a comfortable and safe place in which to play sport. Halls may also be used for non-sports purposes so the choice of finish must suit a range of functional and aesthetic requirements.

- An impact, energy absorbing floor as defined in British Standard 7044 (Part 4) is essential for sports use.
- Semi-sprung beech, beech veneer and various composition and synthetic surfaces can meet the criteria set out in the British Standard.
- Colour should contrast with the walls and be of 40%—50% reflectance value.
- Roller skating makes particular demands on floor finish specification and hardwood surfaces must be laid with support under all board joints. Street skates should never be worn in the hall.

This subject is dealt with in detail in a separate guidance note.

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

- sanded orientated strand board
- plywood and fairfaced brick
- painted blockwork.

Whatever material is selected it must be run full height 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 must be around 50% to give sufficient contrast to a white shuttlecock but not so dark as to result in an oppressive interior.
- The wall colour should contrast with the floor and be uniform across the wall plane.
- Include a 150mm skirting designed for easy replacement if roller skating is a user sport.
- Doors and door frames must be flush with the internal surface. Escape doors require panelling above and below the crash bar.
- Never locate climbing walls in the sports hall, they require a dedicated space.
**External walls**

When selecting materials for external walls consider the following points:

- Successful external claddings can include colour-coated steel. Where profiled metal is used this looks better when run horizontally.
- Cedarboarding can be appropriate, is cheaper than metal cladding and requires no 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, UPVC or hardwood.

**Roof**

The roof soffit and structure should:

- Be a uniform colour, preferably white with a 90%+ reflectance value.
- Make provision for acoustic absorbency. Reverberation time should not exceed two seconds at mid-frequency.
- The roof decking should span the main beams to achieve minimum visual obstruction.
- Internal linings or suspended ceilings must be impact-resistant.
- Suspended ceilings are generally inappropriate for sports halls.
- Mill-finish standing seam aluminium 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**

The hall will be equipped with:

- wall- or ceiling-mounted hinged basketball goals with additional practice goals fixed directly to the wall
- roof structure-mounted spotting rig for gymnasts and tracked division netting
- floor and possibly wall sockets with flush-fitted cover plates will be required for specific items of equipment
- pulley-mounted net bags
- spotting rig duct to permit unobstructed wall planes at below 2m height.

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![Galvanised steel columns and cedarboard cladding contribute to this interesting, low maintenance sports centre exterior.](image)

Escape doors must be panelled out to line through with the wall surface. The bottom 1.2m is part of the five-a-side football rebound zone and a flush facing is essential for overall safety.
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 might 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 must have easy access from the hall with wide door openings.
- Up-and-over, sliding, folding and side-hung doors can be considered and must be detailed to resist impact damage and to be free from projections.
- Wide-leaf, side-hung panels usually require a steel frame.
- A store depth of 5m 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.

Mat storage

Mats require a separate one-hour fire-rated enclosure vented to the external air and equipped with a smoke detection system. 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 x 1m.
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.

Schedule of loose equipment for a typical four-court hall

<table>
<thead>
<tr>
<th>Sport</th>
<th>Equipment Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badminton</td>
<td>4 sets posts, 4 nets, 2 spare nets</td>
</tr>
<tr>
<td>Bowls</td>
<td>4 short mat carpets, rolled, each 1.83 long x up to 0.5m diameter</td>
</tr>
<tr>
<td>Five-a-side football</td>
<td>1 pair portable goals with anchor points, each 5 x 1 x 1.2m</td>
</tr>
<tr>
<td>Handball</td>
<td>1 pair goals, each 3 x 2m</td>
</tr>
<tr>
<td>Hockey</td>
<td>1 pair goals, each 3 x 2m</td>
</tr>
<tr>
<td>Gymnastics</td>
<td>range of apparatus with anchorage points and floor mats</td>
</tr>
<tr>
<td>Judo/karate</td>
<td>mats, each 2 x 1m (one 14x14m matted area requires 98 mats)</td>
</tr>
<tr>
<td>Trampoline</td>
<td>2 trampolines, folded, each 3.040 long x 2.300 wide x 2.220m high</td>
</tr>
<tr>
<td>Netball</td>
<td>1 pair adjustable posts, each 3.05m high</td>
</tr>
<tr>
<td>Table tennis</td>
<td>6 tables, folded, each 1.855 x 1.830 x 0.65m, nets and supports</td>
</tr>
<tr>
<td>Team benches</td>
<td>2</td>
</tr>
</tbody>
</table>

Location of equipment stores: it is important to site stores where they are accessible from both sides of a subdivided hall and clear of wall-hung equipment. A less convenient alternative is to provide separate stores to each end of the hall. Either way, store doors and their ironmongery must be sufficiently robust to withstand frequent body and ball impact.
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Fitness equipment room

A complementary space in most halls. The minimum practical floor area is 25m², and 80—100m² is the norm for small sports centres, with a preferred ceiling height of 3.5—4m.

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.

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.

Secondary halls

Any multi-activity space that is complementary to the main sports hall. Secondary halls can range in size from 10 x 10 x 3.5m high for judo, martial arts and social use, to areas of equivalent size but lower specification than the main hall, suitable for team games, exhibitions and wet weather social events. 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 x 12—15 x 4.5m 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.
Changing areas

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

- Always use high quality, easily cleaned materials to give an immediate impression of hygiene and cleanliness.
- Ceramic tiles must 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 roof-lighting. Note that clerestory windows and suspended ceilings are vulnerable to vandalism.

Changing capacity

- This should be provided according to the number of badminton courts x 2 for changeover. This calculation can be exceeded where there is schools use and the need to provide for two or more classes, and in stand-alone halls where extra spaces are required for single sex activities such as keep fit or aerobics.

- Allow 0.9m² per person with a 0.5m bench run in open changing areas and more where cubicles are provided or where disabled provision is incorporated in the general area.
- Fitness equipment rooms require one changing space per 5m² of floor area.
- Aerobics studios and other ancillary halls require one space per 5—10m² x 2 for overlap.
- Squash courts require four spaces per court.

Layouts should:

- Accommodate different ratios of males/females with buffer or individual changing units as required.
- Ideally, provide a proportion of cubicles for male and female customers who require privacy.
- Be accessible to wheelchair users.
- Be equipped with privacy screening or lobbies.

Changing rooms and showers: some key minimum dimensions.
All-weather pitches can share indoor changing with enhanced capacity but grass pitches must have separate provision with field exits and boot cleaning facilities. The design of pavilions and clubhouses is covered in more detail in a separate guidance note.

**Showers**
- Allow one shower point to every six changing spaces. Provide a separate dry-off area and include a proportion of cubicle showers.
- Shower outlets should be at 750mm centres with 450—500mm between end fittings and side walls. Fittings carried around an internal corner should maintain these minimum standards.
- Showers on opposing walls should be spaced 2.5m apart to permit a central circulation route and will require a separate dry-off area to one end.

**Clothes storage lockers**
- Allow 2.5 times the assessed occupancy levels for changing.
- Locate lockers in changing rooms to offer maximum convenience for users.
- Typically, lockers are 500mm deep and 300mm wide and arranged in columns 1.8m high.
- Behind bench lockers save space but are inconvenient at times of peak use.

**Disabled users**
Minimum provision is a dedicated disabled changing room with toilet and shower area, accessed from the main circulation, that allows the disabled user to be assisted by a helper of the opposite sex. Additionally, disabled users 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.
A separate guidance note deals with this subject in detail.

### Toilet accommodation

<table>
<thead>
<tr>
<th>Male:</th>
<th>One WC, one washbasin, one urinal per 15—20 users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female:</td>
<td>One WC per 7—10 users, one washbasin per 15 users</td>
</tr>
</tbody>
</table>

**Smaller four-court halls**
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.

**Larger centres**
These require more dispersed accommodation which can include separate toilets for staff, licensed areas and outdoor changing units.

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**Basin ducts protect pipework and simplify surface cleaning. In this example ‘between basin’ dispensers help conceal any soap spillage.**

**Floor channels with bucket gullies and lift-off grilles make for efficient drainage of showers and other wet areas.**
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.
Cleaner’s 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 bucket sink.

First aid

The most basic provision is shared use with an office or staff restroom containing a sink and drainer, a secure first aid cabinet and access for a stretcher. A clear space of 2 x 1.6m is recommended as a minimum.

In order to achieve compliance with the Code of Practice, a necessity for all but the smallest sports halls, provide a dedicated space and consider increased dimensions for an extended role as a physio treatment room.

Mechanical and electrical services

Heating, lighting and ventilation services can account for a significant proportion of construction costs. Installations should be designed for simplicity and serviceability to achieve the required environmental conditions and energy saving measures, good insulation and sealing and automatic light switching should be deployed. These topics are fully covered in separate guidance notes.

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. All-weather areas will require paved routes connecting with the hall’s 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 all-weather 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.
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more people involved in sport
more places to play sport
more medals through higher standards of performance in sport

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There are a number of Guidance Notes on related matters. A current list of these can be obtained from:

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