



Affordable Sports Halls

An essential reference for sport hall projects on school sites.

The review ties in with work by the Sports Hall Advisory Group and the Sport England publication 'Developing the Right Sports Hall'.

Indicative base construction cost to Sport England standards from £1,145 / m²

Typical base construction costs (4 court hall)¹:

a) Sports hall	£1.04m
b) Sports hall + changing	£1.33m
c) Sports hall + changing + health and fitness	£1.88m

Typical construction periods 21 - 30 weeks

Potential community use income from £26k - £95k / year ¹, for a stand-alone sports hall (4 or 5 courts).

Enhancing this offer to include fitness could significantly increase income.

¹ Subject to pricing, programme, site and operating assumptions.

Executive Summary

This information is relevant to the early briefing and design stages of school and community sports hall projects and is intended to give a better understanding of the inter-relationships between:

- Design
- Specifications and sustainability
- Capital funding
- Programmes of use
- Operating budgets.

It is intended to supplement the current information on the Sport England web site and be an essential reference for new sports hall projects. This ties in with the Sport England publication 'Developing the Right Sports Hall' and recent work by the Sports Hall Advisory Group² developing guidance to ensure sports hall developments comply with up-to-date National Governing Bodies (NGBs) requirements.

This review has a particular focus on the affordability of sports halls. At the same time, it illustrates how the capital cost of new projects can be reduced, meet a full range of community needs and comply with good practice standards. The design options illustrated are for a building that can be used throughout the year and provide appropriate internal environmental conditions for teaching and community sport. The review takes into account the current Building Regulations and illustrates how the planning, design and construction processes can be simplified and speeded up.

Potential uses

The information will have a range of potential uses such as:

- Developing feasibility studies and option appraisals
- Establishing a robust project brief
- Developing the business plan and operational budget
- Selecting a procurement route and project programme
- Validating key project details
- Forming a template for future projects.

² National Governing Bodies (NGBs) for Badminton, Basketball, Cricket, Netball, Volleyball and Sport England.

The key findings of the review

The 'affordable' indicative designs and cost plans are based on the use of a rationalised 'traditional' building approach. Key features that help drive down costs include:

- Lightweight composite cladding and structural frame
- Easily sourced and reliable pre-fabricated components
- A best value 'energy strategy'.

The significance of site specific factors and the potential for these to increase costs are also explained. Examples include:

- Local Authority (LA) requirements for the external appearance and zero / low carbon or renewable energy targets
- Client and funding body requirements for alarm and sprinkler systems to protect the building investment
- Sub-soil conditions and the need for long service connections.

The affordable approach should also be reviewed against the wider business objectives for the new facility. Enhancement may be justified to achieve lower life cycle costs and greater market appeal³.

Review capital costs against sports and business objectives.

Enhancement may be justified to achieve lower life cycle costs and greater market appeal.

³ See Sport England's 'Developing the Right Sports Hall'.

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An extensive range of supporting technical appendices to meet all year round use, building regulations and internal environment for teaching and sport

PDF layouts can be downloaded from the Sport England website

http://archive.sportengland.org/facilities_planning/design_and_cost_guidance/sports_halls/affordable_sports_halls.aspx

Appendices

See separate Appendices for key assumptions and details
(within the affordable design and costings)

1. Current layouts and sports equipment
2. Schedule of areas
3. Building fabric
4. Sports hall flooring
5. Acoustics
6. Structural design
7. Energy and sustainability
8. Building Services
9. Artificial lighting

Introduction

Purpose of document

This review provides information that can support the decision making processes for new sports hall projects on school sites. It can assist with feasibility studies that are required to test the suitability of a particular site. For example, the implications for the size of the building, capital cost, construction programme and business plans that should be included in the initial project brief. Alternatively, the information can be used to validate particular details or used as a template for a complete project.

However, the review is not intended to replace the services of an Architect and the specialist supporting team of consultants that will be required to fully develop the feasibility studies, business model, detailed design and operational plan for a particular site. The indicative layouts, specifications and supporting information should be reviewed and adjusted in the context of each project.

Select a project team with good previous experience of sports hall projects.



Approach

This review is based on a number of indicative designs that are:

- Efficiently planned
- Functionally efficient
- Meeting school and community sport requirements
- Contained within an economical building structure
- Provided with an efficient and cost effective internal environmental control system
- Capable of being quickly constructed
- Easily operated.

The designs illustrate the different amounts of support accommodation that might be appropriate for a new sports hall building. The accompanying cost plans, specifications and other technical details show how these impact on the total cost of a project. The designs may need to be adjusted to suit the individual educational and community requirements and 'tuned' to the physical environment of a particular site. Although the buildings illustrated are designed to be economical, they can be clad in a range of materials such as brickwork, stone or timber as might be appropriate in particular locations.

The indicative designs are compliant with Sport England guidance and current industry standards. The accompanying indicative costs, specifications, procurement information and operation plans show how a new sports hall building can be efficiently delivered.

Strategic Planning

Developing the Right Sport Hall

The development of any sports hall facility will require a significant capital investment and decisions made at the start of the project will impact on the finances and sports use for many years to come. It is therefore essential that all decisions are robust and based on evidence of needs.

Whatever the scale of provision or the mode of operation the same strategic planning principles should apply. These are best considered before appointing a design team to ensure that there is clarity and an understanding of what is required and why.

Decisions on the size and configuration of the hall, the scale and type of support facilities such as fitness and dance studios, changing and spectator facilities are crucial. They should all be informed by a series of key questions which are considered at the right stage in the project development process.

To help arrive at the right sports hall provision, Sport England and the national governing bodies of sport (NGBs), have developed specific guidance⁴. It consists of an 8 step process to develop the right sport hall provision that;

- meets local needs and
- will be sustainable in the long term through clear, logical business and operational planning.

The process falls into 3 phases

- Information gathering (Steps 1-4)
- Considering the options (Steps 5-6)
- Making the decision (Steps 7-8)

The process highlights the importance of a robust understanding of the existing hall provision, the anticipated sports hall use and a detailed appreciation of the specific sport requirements. For example:

- The type of sport activity, e.g. competition, education, training
- The level of performance, e.g. community, club, regional, international
- The amount of activity, e.g. hours per week.

The guidance explains who can help at each of the stages and defines the outcomes that should be reached at each step

⁴ *Developing the Right Sports Hall (DRSH)* available from the Sport England web site.

Using the affordable sport hall guidance

This 'Affordable' Sports Hall guidance will be particularly useful for projects when considering different options (stage 7) and making the critical final decisions at (stage 8).

Once this decision has been made and the final Statement of Requirements (SOR) has been established, then the project can then move on to the commissioning a design team. (i.e. RIBA⁵ 'Stage 0 – Strategic Definition' which is the starting point for the designs process). Without a properly developed and clear SOR there is a risk that there will be delays, frustration and potentially abortive fees due to the project starting on the wrong basis.



The eight steps from Sport England's Developing the Right Sports Hall (DRSH)

⁵ RIBA Plan of work www.ribaplanofwork.com/

Developing the Right Sports Hall

The guidance will help:

- Clubs, operators and stakeholders to understand and articulate the sport specific and other sporting requirements of their local community
- Provide a 'step-by-step' process for project teams to gather information and develop a clear 'Statement of Requirements' for the hall(s). This can be handed on to the design team to develop a design brief and take forward the detailed design
- Ensure that the right sports provision is delivered that meets local needs and sustainable in the long term, through clear, logical business and operational planning.

Recommended sports hall dimensions:

- 4 court 34.5 x 20.0 x 7.5 m

- 5 court 40.6 x 21.35 x 7.5 m

For schools to help foster the opportunities offered by sports clubs, development of teams and competitive fixtures.

The DRSH 8-step process summarised

Information gathering

(Steps 1-4)

These stages explain the detail of how to gather the key information required to inform any decisions, who can help you and the tools available.

This stage forms the robust foundation for any future decisions and must therefore be properly considered and completed before moving on to consider the next stages.

Options

(Steps 5-6)

These stages explain how to develop different options that might provide what is required into a simple Statement of Requirements (SOR).

Making the decision

(Steps 7-8)

The final stages take you through considering the business case and the value for money of the proposals. If necessary the project can move iteratively between Stages 5 – 7 before making the final decision of what is required.

The three key phases from Sport England's Developing the Right Sports Hall (DRSH)

Building Design

Sports hall dimensions

This review is based upon the current recommended dimensions for sports halls in the Sport England publication 'Developing the Right Sports Hall' and the updated 'Sports Hall Design and Layouts' Design Guidance Note⁶. These are regarded as the minimum dimensions that are necessary to achieve a 'fit for purpose' multi-sports hall project. See Sport England's web site for further information on sport participation and fostering the opportunities offered by sports clubs, development of sports teams and competitive fixtures. The sizes allow physical education and sport within a school, inter-school competitions and community sport at a range of levels to take place in an appropriate environment.

- 4 court 34.5 x 20.0 x 7.5 m
- 5 court 40.6 x 21.35 x 7.5 m

In consultation with sports equipment suppliers and building on previous work by the National Governing Bodies (NGBs), this review examines the most effective approach to integrating the court layouts, fixed equipment and artificial lighting. In turn, this is combined with studies of the most cost efficient building structure and building envelope and environmental conditions.

Typical court layouts and the locations of the fixed sports equipment that needs to be built into the structure are shown in Appendix 1. For the purpose of this review and in order to reduce complications and additional costs, the courts are set out in a symmetrical pattern within the two halls sizes. However, there is scope for the layouts to be adjusted to give additional space around particular courts if there are specific requirements. Care should be exercised to avoid floor markings becoming confusing and conflicts occurring in the location of fixed equipment.

Accommodation options

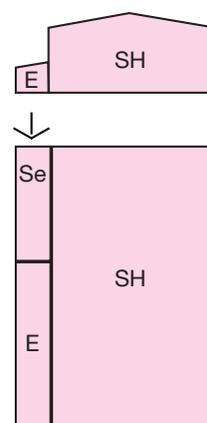
This review illustrates three different scales of support accommodation that will cater for a range of scenarios for school sites:

- Sports hall
- Sports hall + changing
- Sports hall + changing + health and fitness

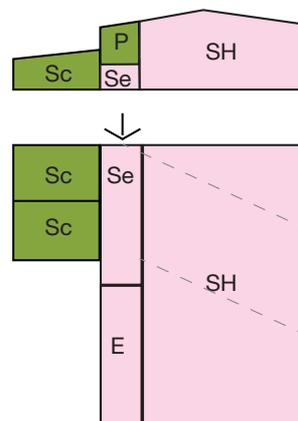
These are discussed in more detail below and set out in an accommodation schedule in Appendix 2.

Key

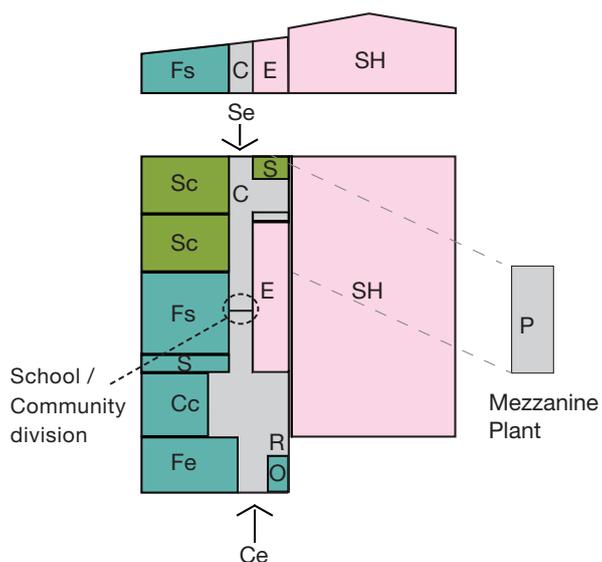
	Sports hall
	Changing
	Health and fitness
	Circulation
SH	Sports hall
E	Equipment store
Se	School entrance
Sc	School changing and toilets
Ce	Community entrance
Cc	Community changing and toilets
Fe	Fitness equipment gym
Fs	Fitness studio
C	Circulation
O	Office
R	Reception
S	Storage
P	Plant



a) Sports hall



b) Sports hall + changing



c) Sports hall + changing + health and fitness

⁶ See Sport England web site at: http://archive.sportengland.org/facilities_planning/design_and_cost_guidance/sports_halls/affordable_sports_halls.aspx

The principles used in these 3 worked examples can be readily transferred to other community sports hall projects and, for example, the scenario where the sports hall is part of a larger building project.

a) Sports hall

This option would be applicable where changing rooms already exist on the site and where these can be conveniently used for the new sports hall. In such a scenario, the support accommodation would only be required for appropriate access and egress to and from the hall, storage of the loose sports equipment and the containment of service connections, cleaning materials, etc.

It is assumed that the building would be used exclusively by the school during the normal school day, but that managed community use could also be possible during evenings and weekends (see Section 5 – Potential Income).

The following accommodation has been assumed:

- Draught lobby
 - Suitable for wheelchair users and people with children's buggies
 - With automatic doors to reduce energy losses.
- Lobby area
 - Suitable as a waiting / crush space before and after lessons for the maximum number using the hall (c60 students)
 - Wall space for notice boards and a 'hall of fame' display of pupil's achievements and inspirational sporting images
 - Space for secure wheelchair and buggy storage
 - Space for a vending machine
 - Space for security lockers
- Unisex accessible toilet
- Cleaning equipment store
- Incoming services space
- Sports equipment store
 - Located to provide access into either half of the sports hall.

b) Sports hall plus changing

The second option would be applicable where appropriate changing accommodation is not available on the school site and would be required as part of the new sports hall development.

Again, it is assumed that the building would be used exclusively by the school during the normal school day, but that it has the potential for managed community use during other times.

The following accommodation has been assumed:

- As the sports hall option
 - Draught lobby, lobby area, unisex accessible toilet, cleaners store
 - Sports equipment store.
- Changing rooms
 - 2 separate changing areas for 30 people each with cubicle showers (112m²). The layout is designed so that the teacher or coach can easily supervise the area. These could be used for separate male and female changing or for two groups of a single sex as required. The layout provides a 'front of class' zone for a teacher or coach and wall space for a white board or monitor. This can help brief pupils before the PE lessons and review achievements afterwards. The teacher would also be well positioned to supervise the entrance doors and the route to the adjacent toilets
 - The toilets are provided adjacent to the changing area (35m²).
- Plant room area
 - Additional plant room space is provided in the void above the lobby area (see Appendices 7 and 8 for *Energy and Sustainability* and *Building Services*).

c) Sports hall, plus changing plus health and fitness

This third option includes additional community facilities to improve the business viability and to offer more options for the school. They consist of a fitness equipment gym (80m²), a fitness / dance studio (107m²) and some limited community changing accommodation.

The circulation is arranged to give separate entrances for school and community use and the sports hall and other community areas to be kept as two distinct secure zones. This can allow school use of the sports hall (and fitness studio as required) to run concurrently with some managed community use of the other facilities during the school day.

An average of 4.5m² is assumed per person in the fitness gym and 5m² per person in the studio. A schedule of areas is included in Appendix 2.

Alternative massing of the main components

The indicative designs developed for this review have an in-built flexibility for the support accommodation to be re-positioned in relationship to the sports hall to achieve a different footprint and three dimensional massing of the building. Alternative arrangements might be required to fit in with the circulation within the school or a wish to link up with other facilities. However, such adjustments are likely to incur additional costs.

Site planning and site specific requirements

A sports hall could be in the form of a single detached building with a range of support accommodation as indicated in the three models already described, or it could be a component within a larger building complex. Whilst the indicative cost plans that are shown later only relate to the stand-alone scenario, there are likely to be a range of costs and sustainability benefits if the sports hall is integrated into a larger development.

Each site will have particular characteristics and environmental requirements and these should be reviewed as part of the feasibility and early design processes.

Locating a new sports hall on a school site

The diagram below shows a typical school site with a new sports hall building conveniently positioned adjacent to the existing sports facilities. It is also in a prominent position in relation to the public entrance and car parking to allow easy access for community use. At the same time, the location should include fencing and landscaping features to maintain the internal security of the school buildings.

The external walls of the sports hall could also be used for signage and branding.



Indicative example of prominent signage to community entrance of a 5 court sports hall

An options appraisal should be undertaken for locating the new sports hall with space for future expansion and with good links to:

- Existing school sports facilities
- Public entrance
- Car parking

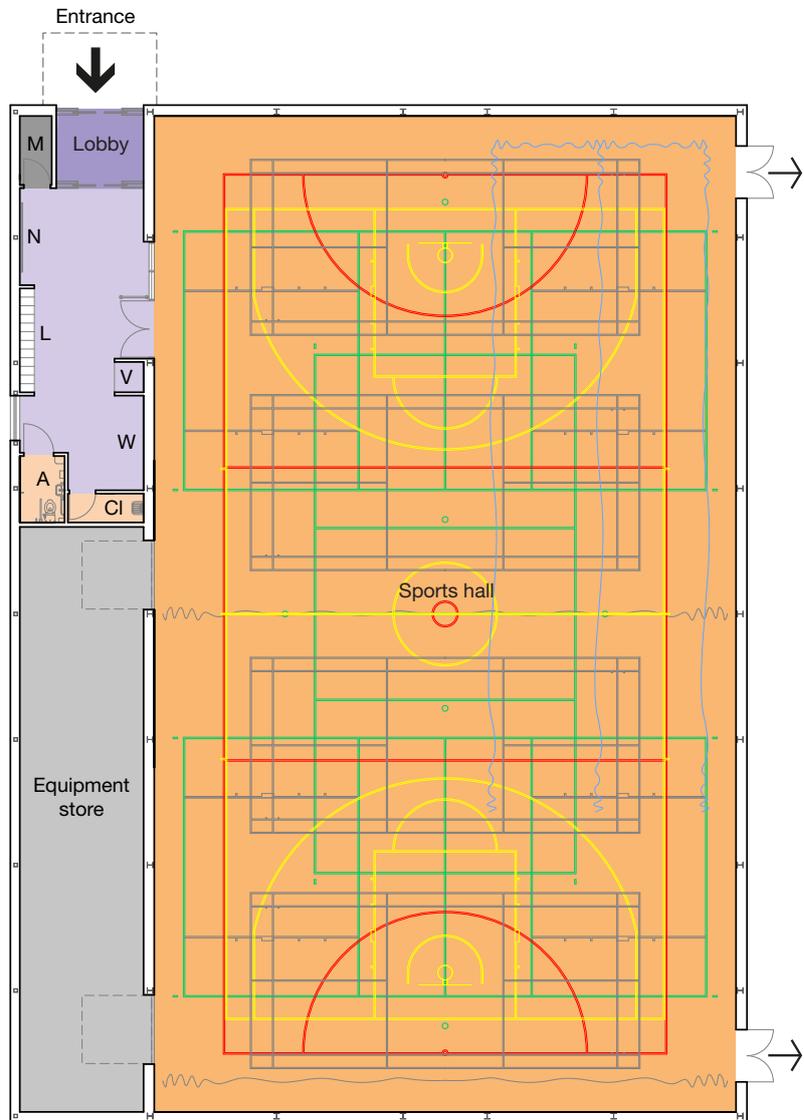


Indicative example of a new 5 court sports hall with studio and gym facility (option 2c) incorporated into an existing school site (based on diagram from DfE Building Bulletin 98 Briefing Framework for Secondary School Projects)

Indicative plans

Option 1a - 4 court sports hall (GIFA 850m²)

Floor plan



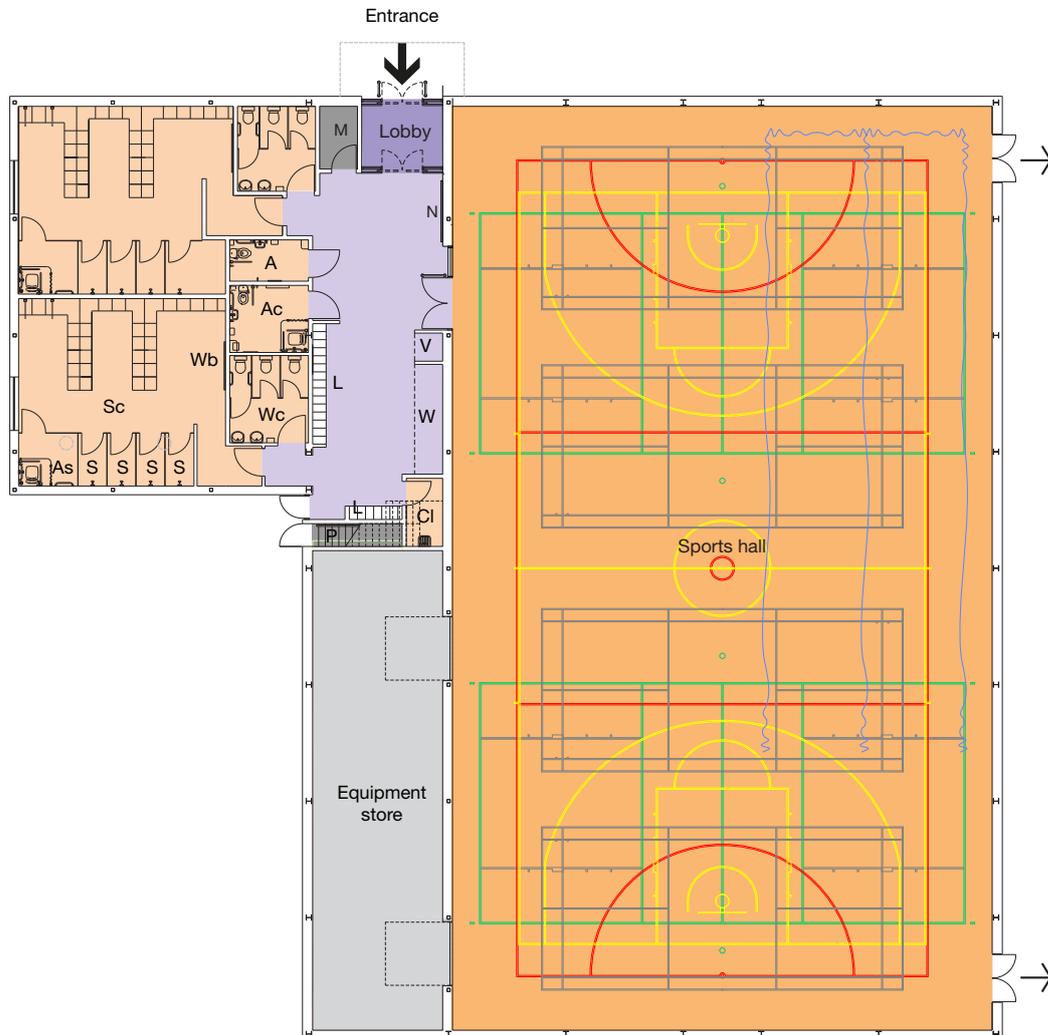
KEY

	Circulation
L	Lockers
N	Notice board / 'Hall of fame'
V	Vending machine
W	Wheelchair / buggy storage
	Meter room
A	Accessible WC
Cl	Cleaners store

0 5m

Option 1b - 4 court sports hall + changing (GIFA 1,087m²)

Floor plan



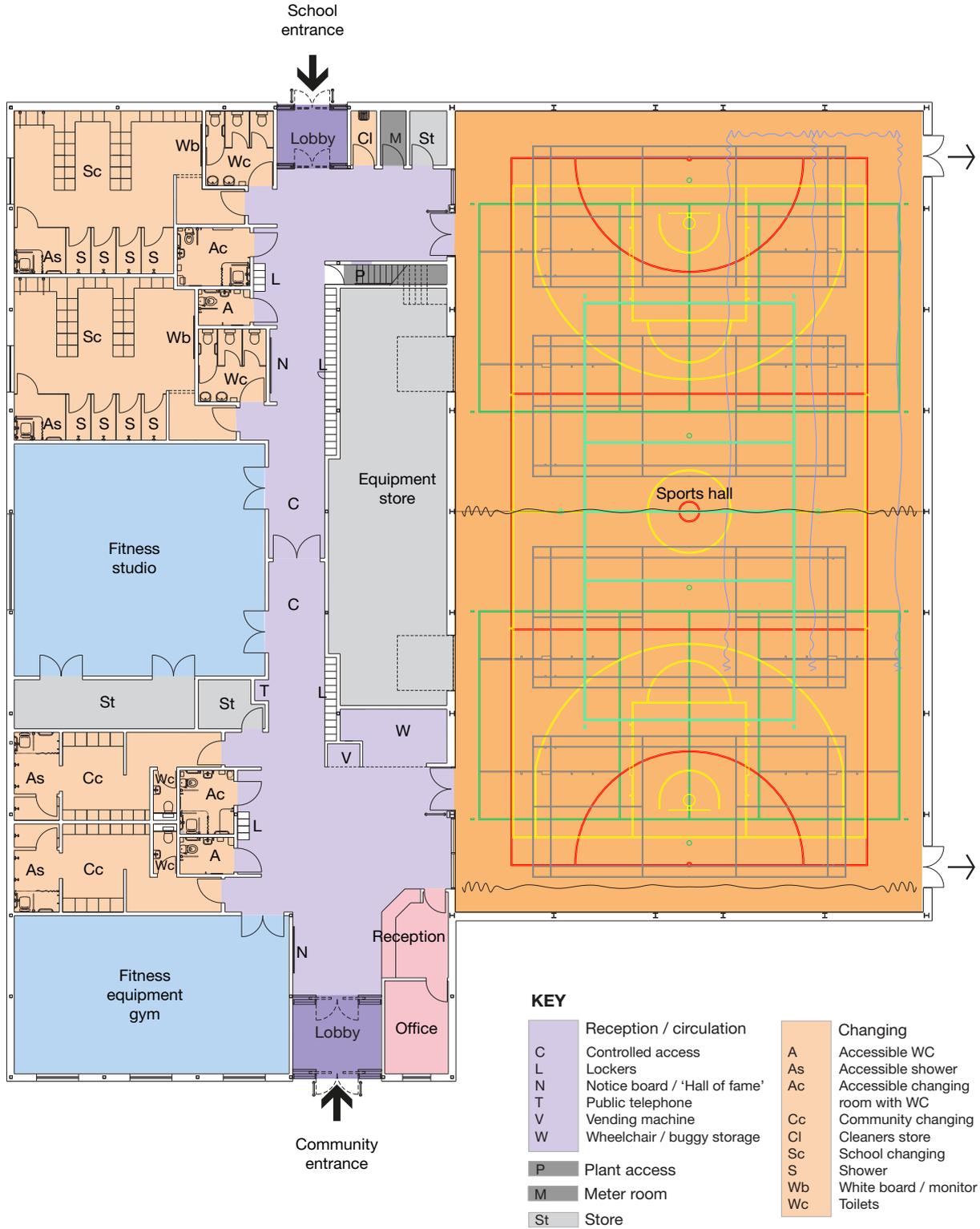
KEY

L	Circulation	A	Changing
N	Lockers	As	Accessible WC
V	Notice board / 'Hall of fame'	Ac	Accessible shower
W	Vending machine	Sc	Accessible changing room with WC
M	Wheelchair / buggy storage	Cl	Cleaners store
P	Plant access	S	School changing
M	Meter room	S	Shower
		Wb	White board / monitor
		Wc	Toilets

0 5m

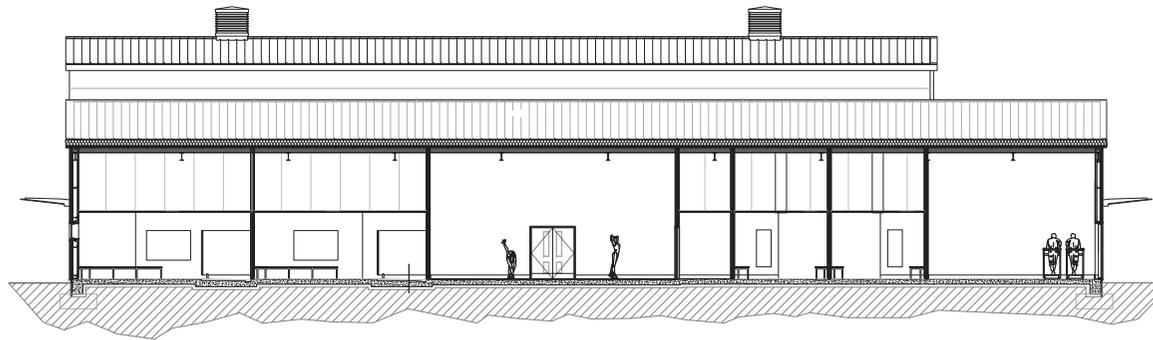
Option 1c - 4 court sports hall + changing + health and fitness (GIFA 1,532m²)

Floor plan

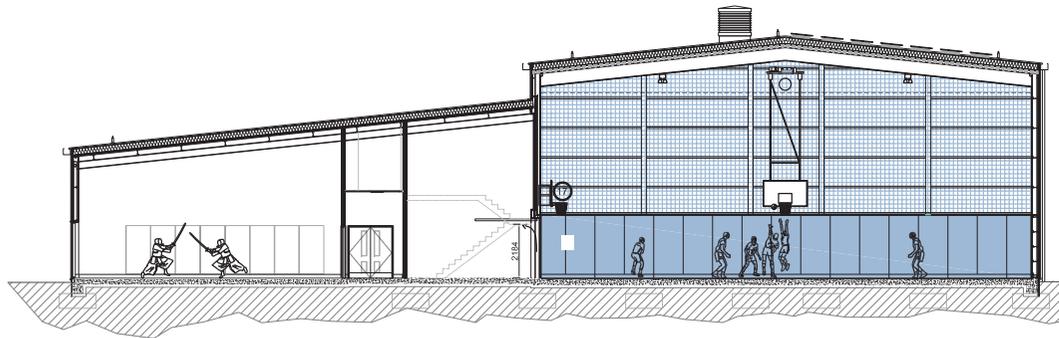


Indicative sections

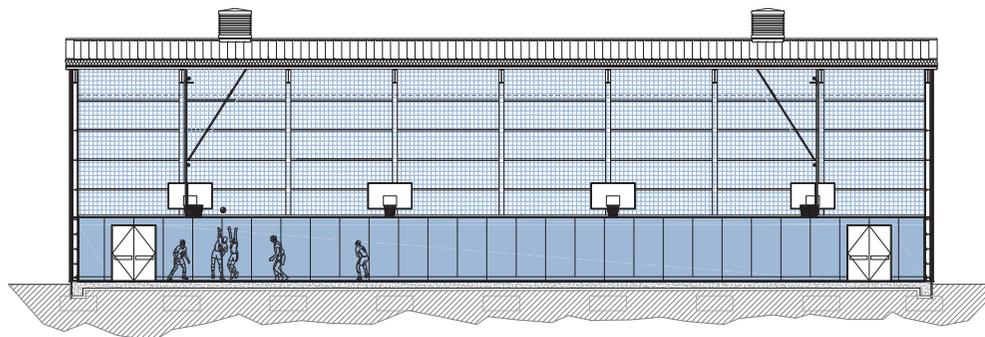
Option 1c - 4 court sports hall + changing + health and fitness



Longitudinal section through support accommodation



Cross section

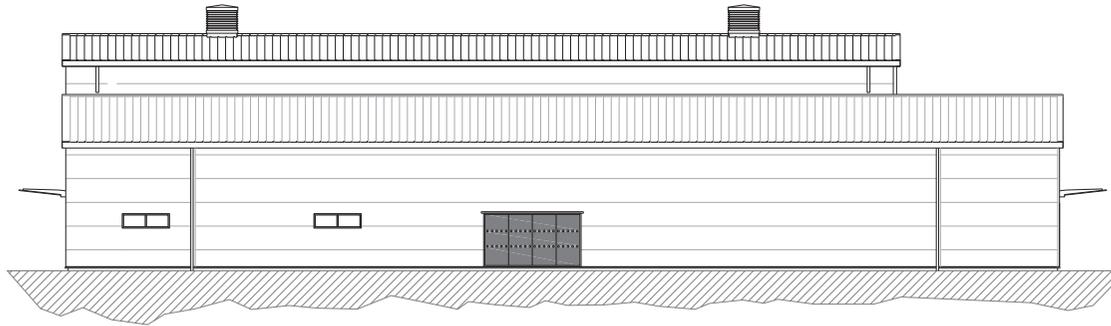


Longitudinal section through sports hall

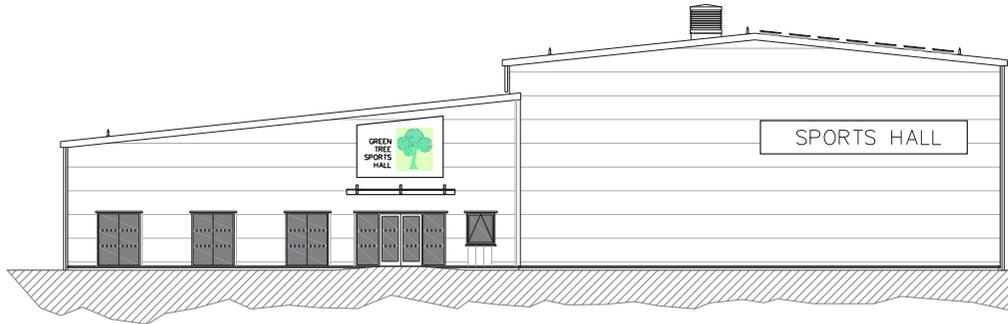
Indicative elevations with alternative wall materials

Option 1c - 4 court sports hall + changing + health and fitness

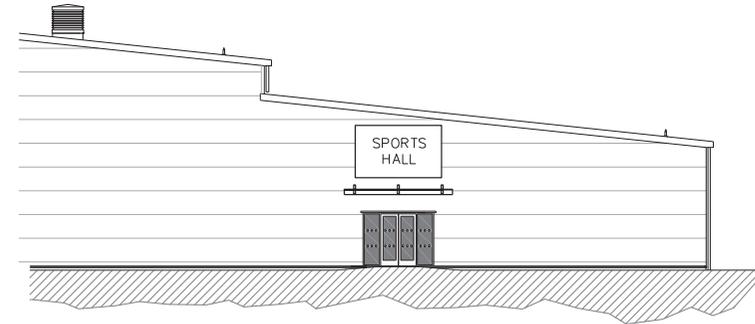
Horizontal cladding option



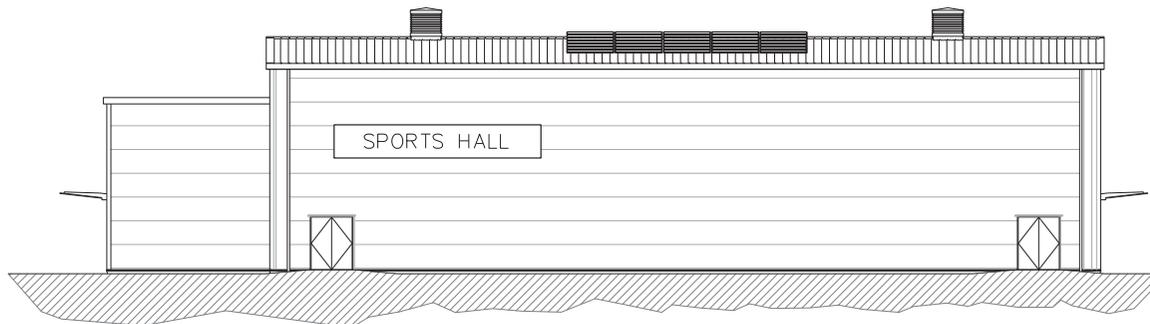
Support Accommodation Elevation



Community Entrance Elevation



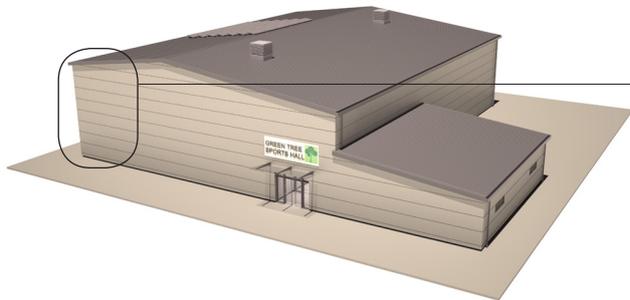
Part School Entrance Elevation



Sports Hall Elevation

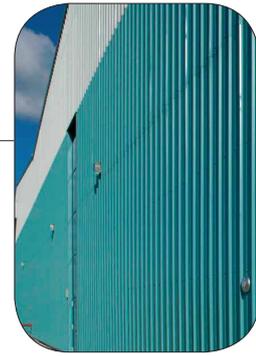
Alternative elevation treatments

The indicative design could also be modified to have alternative external cladding materials to suit the local environment and particular planning requirements. For example, the lightweight metal cladding that is allowed for in the indicative plans and cost plans (and specification in Appendix 3) can be arranged in a range of patterns and colours. Alternatively, a range of other materials such as brickwork or timber cladding could be used.



New 3D building form

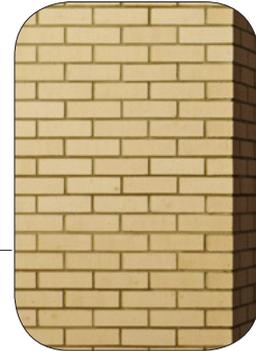
Vertical cladding
(base version)



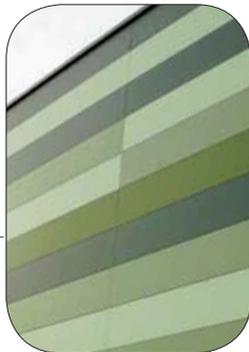
Horizontal cladding
(base version)



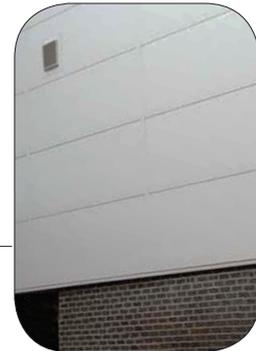
Brick



Horizontal cladding
(horizontal sheet cladding)



Brick and horizontal cladding



Horizontal cladding
(micro-rib option)



Insulated render and timber cladding



General construction issues

There are many features in this review that help reduce capital costs and increase affordability. For example, the indicative designs include:

- Economically planned and functionally efficient floor layouts
- A simple and economical structural design accommodating court layouts
- An uncomplicated building envelope
- The use of building components that avoid wet trades, are economical, widely sourced and have established good performance.

Detailed inter-relationships have also been carefully considered such as:

- Composite lightweight cladding: The selection of a factory finished system can facilitate a range of design options for the external appearance of the building. This can help to create an individual identity for a specific project or alternatively, help the building to blend in with the local environment. Use of lightweight cladding can also enable the weight of the steel structural frame and size of the foundations to be reduced. The wall cladding system can also speed up the construction programme and achieve a water tight building envelope earlier in the process.
- The 6° roof pitch has been selected to suit a wide range of economical roof coverings and to accommodate the internal roof mounted basketball goals. It also allows for the installation and maintenance of photovoltaic (PV) panels. The PV panels are a cost effective way of including a renewable energy component within the project (see Appendix 7 Energy and Sustainability).
- The structural grid used for the sports hall structure has been extended over the support accommodation to increase the structural efficiency and avoid additional columns. The location of the fixed sports equipment has also been integrated into the design to reduce the need for secondary structure to support basketball goals, curtain tracking and lighting.
- The use of a number of proprietary pre-fabricated components such as the flush detailed escape doors and equipment store doors in the sports hall. These strategies can avoid the project team having to resolve complex detailing problems and which should reduce both design and construction timescales.

- The integration of sound absorption into the roof deck soffit and the upper sections of the side walls of the sports hall helps to achieve the required internal acoustic conditions in an economic manner.

See more details in Appendix 3 Building Fabric.

Fire strategy

The indicative designs and cost plans are based on a fire strategy that will comply with the Building Regulations and be appropriate for the fire risk assessment that will be necessary before the building is put into use. The fire warnings and escape requirements are achieved with a combination of L2 (or L3) fire alarm system, alternative exit routes, fire separation of high risk areas such as the plant room and the installation of emergency lighting and signage.

The specification of internal linings such as the ceilings, acoustic panels and rebound walls are required to comply with Class 1 in public areas and the netting / curtains and other sports equipment need to have a minimum performance standard meeting BS 5867 Type B. The load bearing elements of the structure to have a 60 minute fire resistance where required such as the floor to the mezzanine plant room.

The performance of exterior cladding materials when exposed to fire should be considered. Commissioning clients should consult their Insurer for confirmation of any specific issues that might affect the Underwriter's assessment of risk / premiums or their willingness to insure. Generally specified composite cladding products should comply with the Loss Protection Council's (LPC) Design Guide for the Protection of Buildings.

There are a number of site specific factors that could incur additional fire resistance provisions. For example: additional fire resistance of the external walls and structure if the building is located close to a boundary; access and facilities for fire and rescue services; property protection measures and funders requirements such as a sprinkler system⁷.

Structural steel frame

The indicative designs are based on a structural frame that spans the width of the sports hall and provides support to the roof deck and the external walls. A modified version of the structural frame is extended over the support accommodation. The review considered glued and cross laminated timber structures but concluded that for all versions of the

⁷ See BB100 'Design for fire safety in schools'.

4 and 5 court buildings, a steel 'braced frame' with a 6° roof slope and a central ridge offered the most economical option (see Appendix 6).

The roof pitch provides internal space for retractable roof mounted basketball goals to be supported from the roof structure and it is also suitable for a range of economical roof coverings. The structural design is based on a 4.4 m grid for the 4 court hall options and a 4.3 m grid for the 5 court hall options. The roof deck spans directly between the roof beams to avoid the need for purlins that would involve extra weight of steel. Light fittings can be supported from the roof decking and other equipment can be supported from the structural steel frame or secondary steelwork where needed. See Appendix 6 for further details and the design assumptions that have been allowed for in the indicative cost plan.

Environmental services

The design of the services installations has been developed to achieve the least capital cost, to comply with Building Regulations and to meet the needs of sport. The table below is a summary of a solution that is fit for purpose at least capital cost, together with identifying the approaches adopted for each of the options with respect to the environmental services. Further detail can be found in the appendices: Appendix 7 contains further information on the approach to energy efficiency and sustainability, Appendix 8 contains detail on the building services installations, while Appendices 5 and 9 cover issues of acoustics and lighting in further detail.

Sports halls are generally lightly serviced buildings and do not have the levels of complexity associated with wet sports facilities. However, the sports hall itself poses key challenges to create a comfortable environment in part due to the volume of the space but also the need to be suitable for a variety of sports and other uses. The three main items to address are:

- Heating and overheating
- Lighting, including daylighting
- Acoustics

There are complex inter-relationships between many aspects of the design that must be considered, such as the impact of rooflights for example on the needs of many sports. The likely usage profile of the sports hall must also be assessed on a case by case basis, the energy strategy that supports a busy community sports hall may well be different to one that is suitable for a hall that is used predominantly for school use. The approaches taken in the base scheme design as set out in the table below are judged to be suitable for a wide range of uses at least capital cost. As a result, the designs tend towards simplicity and robustness. Other schemes may well seek out alternative approaches that are more suitable for a specific site or application.

Base scheme environmental services summary						
OPTION	1a	2a	1b	2b	1c	2c
Sports hall size	4-court	5-court	4-court	5-court	4-court	5-court
- Gas radiant heating	•	•	•	•	•	•
- Fluorescent lighting (500 lux)	•	•	•	•	•	•
- Natural ventilation with summer fan boost	•	•	•	•	•	•
Support accommodation						
- Electric space heating	•	•				
- Electric domestic hot water	•	•				
- Mechanical ventilation with heat recovery to changing and WCs			•	•	•	•
- Wet space heating			•	•	•	•
Heating system						
- Gas boiler for domestic hot water			•	•	•	•
Low / zero carbon						
- Photovoltaic panels	•	•	•	•	•	•

Heating and overheating

The range of conditions within a sports hall can vary significantly. When used for sports during winter at low occupant density, there is a demand for heat which can be controlled by keeping internal set point temperatures relatively low. In use at high density for exams in the summer, the design condition is very different and excess heat must be rejected from the hall to prevent overheating. In all conditions, the sports hall benefits from being insulated from the external environment to limit gains and losses. The design for the hall is based on providing good component U-values and a reasonable degree of air tightness. Improvements to insulation levels and air tightness beyond the values considered were judged to have a diminishing return and potentially place onerous demands on the construction beyond normal economic methods.

Gas fired radiant heating is the preferred method of heating the sports hall. It is tried and tested and an efficient means of heating large volumes. The quick response of radiant systems makes it particularly suited to multi-use facilities such that temperatures can be quickly raised if required for different uses.

Overheating, rather than keeping warm, is often more of an issue for sports halls and more difficult to control. The basic approach to limiting summertime temperatures is to create high volumes of airflow through the hall. To control summertime temperatures the affordable design solution uses roof mounted ventilation terminals with integral extract fans for high levels of ventilation in summer conditions.

Lighting

Providing daylight to the sports hall has been considered and many sports halls have successfully integrated rooflights in combination with black out blinds to control glare for various sports. The national calculation methodology does assume that sports halls are provided with rooflights with the result that a 'blind box' approach is immediately at a disadvantage when it comes to energy performance as assessed in the building regulations. The affordable scheme, however, is based on a blind box without rooflights or other forms of fenestration for the following reasons:

- Reduced capital cost, other methods to achieve compliance with building regulations were found to be more affordable
- No conflict with the needs of various sports
- Simplicity and robustness, reduced risk of roof leaks, no requirement for internal blackout blinds.

To compensate for the disadvantage in energy terms of the blind box approach when assessed according to the national calculation methodology, photovoltaic panels are incorporated into the scheme. Photovoltaic panels were chosen as the preferred option on both cost grounds and simplicity of maintenance when compared with other technologies such as solar thermal panels or combined heat and power plant.

Since the last publication of this document, the use of LED lighting has become more widespread, costs have reduced and availability has increased. Sport England is currently carrying out a trial of LED lighting for sports halls and their suitability for a range of sports. However, at this stage, the affordable design is based on the use of tried and tested fluorescent lighting to the hall. LED lighting has been used within all support accommodation.

Various configurations of artificial lighting layouts have been considered to meet requirements of various sports and school use. One of the key issues is the design lighting level. Most sports recommend minimum lighting levels of 500lux for a reasonable level of play while 300lux is adequate for most school use and casual sports.

In addition, the National Calculation Methodology assumes a lighting level of 300lux so design lighting levels beyond 300lux result in a requirement for compensatory measures to improve energy performance. The affordable design is based on an assumption of lighting to 500lux in the base scheme with the ability to switch down to 300lux for general school use. For the purposes of compliance with Building Regulations it has been assumed that the lighting will operate at 300lux for 50% of the time and 500lux for 50% of the time. Options are provided for enhanced lighting schemes for various sporting uses.

Further detail on lighting is provided in Appendix 9.

Ensure that affordable design considerations are 'fit for purpose'.

The design must meet the needs of the key sports, be attractive to users and be easy to use.

Potential Income and Surplus from Community Use

Community access

This section should be read in conjunction with the Sport England web site⁸ advice on community access to school sports facilities after school, at weekends and during school holidays. The website explains the benefits of community use and includes a range of toolkits and practical guidance.

The following outlines key assumptions and indicates potential income surplus.

School hours of use, term time (39 weeks per annum)

A typical school sports hall will be used by the school during term time, usually between 9am and 5pm, 5 days a week for 39 weeks per annum, but may be largely unused between 5pm and 10pm during the week and at weekends.

Potential income and operating expenditure, term time (39 weeks per annum)

The total hours of use could be doubled if opened up for community use during evenings and weekends. This gives the opportunity for considerable revenue to be generated which can both help to maintain the facility and provide an income. For example, a 4 court hall opened for only 20 hours per week of community use, over 39 weeks of the year, could achieve a net surplus of approximately £16,000, even after the costs of gas, electricity, cleaning and maintenance of approximately £10,000 are deducted.

The table below shows a typical business summary for a (39 week per annum) 4 and 5 court sports hall for varying hours of community access. Detailed explanations of charges and income are available in the toolkits on the Sport England website.

Potential income summary: base date 1Q 2015						
39 weeks per annum use, i.e. term time	40 hours per week		30 hours per week		20 hours per week	
	4-court	5-court	4-court	5-court	4-court	5-court
Variable costs (gas, electric, maintenance, staff)	£23,000	£27,500	£17,500	£21,500	£10,000	£11,000
Potential income	£62,500	£77,500	£46,000	£57,500	£26,000	£33,000
Surplus for the school	£35,500	£50,000	£28,500	£36,000	£16,000	£22,000

The table below indicates the potential income if the facility is opened for 48 weeks per annum, i.e. term time and non-term time (evenings and weekends):-

Potential income summary: base date 1Q 2015						
48 weeks per annum use, i.e. term time and non-term time	40 hours per week		30 hours per week		20 hours per week	
	4-court	5-court	4-court	5-court	4-court	5-court
Variable costs (gas, electric, maintenance, staff)	£28,250	£34,000	£21,750	£26,250	£12,500	£13,500
Potential income	£76,500	£95,500	£56,500	£70,500	£32,250	£40,500
Surplus for the school	£48,250	£61,500	£34,750	£44,250	£19,750	£27,000

Opening up the sports hall during school holiday periods has the potential to generate increased income. Essentially, there is the potential to do this from day-time use of the sports hall from 9am to 12 noon and from 1pm to 4pm, for e.g. summer sports camps, junior coaching, etc. This could generate up to an additional surplus of £10k per annum (additional operating costs have been taken into account) beyond the figures noted on page 21.

⁸ See Sport England web site at: http://archive.sportengland.org/facilities_planning/design_and_cost_guidance/other_design_guidance.aspx

Effective programming

The more varied the programme of use, the more opportunities are created for further income generation. A sports hall may simply be open for community use for only 20 hours per week and solely programmed for club or group bookings. These could be predominantly adult use and may be made up of badminton, cricket (from January to March), some football and other team sports such as basketball, netball and volleyball.

A 5 court sports hall opened for 40 hours per week would obviously offer much greater flexibility to develop both junior and adult use and include instructional sessions.

The table below shows a typical programme of use for term time (39 weeks) for a 4 court sports hall open for 40 hours per week, generating a potential £39k surplus for the school.

The increased hours would offer the opportunity to offer coaching sessions for both adults and juniors, more club bookings, including juniors, as well as casual and recreational use offered on a pay and play basis. The following activities could be offered as part of a typical programme of use:

- Junior Learn to Play sessions in: football, cricket, badminton, short tennis, table tennis, basketball, volleyball
- Adult beginner sessions in: badminton, table tennis, bowls
- Larger fitness classes: aerobics, body combat, Zumba, etc.
- Junior birthday party packages: football, multi-sports and inflatable fun
- Club and group hire: football, badminton, cricket (seasonal from January to March) and other team sports such as basketball and volleyball
- Casual and recreation sessions: badminton, table tennis and short tennis

Typical programme of use - school term time (40 hours of community use for a 4-court sports hall)							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
9-10am							
10-11am							
11-12noon							
12-1pm							
1-2pm							
2-3pm							
3-4pm							
4-5pm							
5-6pm							
6-7pm							
7-8pm							
8-9pm							
9-10pm							

Key

Casual / recreation

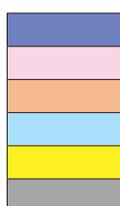
Club bookings

School use / non-term time holiday camps

Coached sessions

Private hire

Closed



Additional facilities to encourage community use and increased income

Potential additional facility enhancements could include a studio or fitness suite. To provide these facilities for community use, additional specialist fitness staffing would be required and additional operational costs, including utilities, would be incurred to deliver a quality service offer. The income from these facilities is based on operating them for 48 weeks per annum, as these could be available during both term time and in school holidays.

Studio

Adding a studio and developing a varied programme of 10 instruction classes a week, plus club or group hires, could generate a surplus of £26k per annum. Based on 40 hours per week, the income could be approximately £45k per annum, with an estimated additional expenditure of £19k for fitness class staff, utilities and operational costs.

Fitness suite

A fitness suite of c20 stations would considerably enhance the offer to the school and the community. A 20 station fitness suite has the potential to increase an operating surplus by £77k. Based on opening 40 hours per week, the additional income could be around £100k with estimated additional expenditure of £23k for fitness suite staff, utilities and other operational costs.

Operational implications of additional facilities

Either a studio or fitness suite, when combined with 30 hours or more of community use, would require a change in the approach to operational management. Whilst 20 hours per week of community access could be delivered by a model of direct hire to clubs, with the caretaker in attendance or a 'trusted key holder' approach, increasing community access hours beyond 20 hours per week would undoubtedly require a move to a more structural and formal management approach.

This would require dedicated staff such as a duty manager, receptionist or key holder to provide a 'meet, greet and manage' service and potentially additional fitness staff as outlined above. The method of operation would have to be determined in each instance and the cost of this staff provision would need to be factored into any business plan projections (included within this business modelling) and considered against the projected increased income.

In summary, by way of example, the table below indicates the potential surplus for a 4 court hall, studio and fitness suite community offer, opening 48 weeks per annum, 40 hours per week. The potential additional income of £10k generated from opening 9am to 12 noon and from 1pm to 4pm is also shown below.

	Surplus
4 court hall	£48k
Studio	£26k
Health and fitness	£77k
Secondary spend	£4k
Surplus for the school	£155k
School hall (non-term time) 9am-12noon and 1pm-4pm	£10k
Surplus for the school	£165k

General assumptions applied to the business modelling

- All prices and income are shown net of VAT.
- 80% utilisation has been assumed for club use, 75% assumed for casual / recreational use, 60% to 70% for coached sessions.
- Assumes maximum of 16 participants per coached session.
- Health and fitness income based on income per station of £5k and based on 20 equipment stations. Health and fitness instructor costs based on £15 per hour.
- No instruction within sports hall for 20 hour per week opening; purely club and casual bookings.
- Element of instruction / coached activity introduced once sports hall open for 30 or 40 hours per week.
- Health and fitness staff costs and introductory coaching rate of £10 per hour.
- All business modelling for the sports hall assumes minimum 39 week (i.e. term time) access for the hours required and excludes school holiday periods where income and usage could potentially be increased further.
- Business modelling for the studio and fitness suite assumes operation for 48 weeks of the year.
- Variable costs shown only apply to the relevant community use hours of opening and do not include any costs in relation to school use between the hours of 9am and 5pm Monday to Friday.

Capital Costs

Overview

This section provides an elemental cost plan analysis of the sports hall as an independent element and the indicative building options for different amounts of support accommodation. The tight planning of the buildings has reduced the internal volumes and the building specifications have been examined in detail in order to increase affordability. Account is also being taken of trends in the construction industry.

Typical base construction costs (4 court hall):

Option 1

a) Sports hall £1.04m

b) Sports hall + changing £1.33m

c) Sports hall + changing + health and fitness £1.88m

Typical base construction costs (5 court hall):

Option 2

a) Sports hall £1.21m

b) Sports hall + changing £1.52m

c) Sports hall + changing + health and fitness £2.05m

Pricing assumptions

An overview of the capital costs of the project is given in the following table based on benchmark data and the area schedule. It includes the following main assumptions:

- Building costs at 1st Qtr 2015
- VAT excluded
- Includes fixed sports hall equipment
- Includes a typical allowance for loose sports equipment (see Appendix 1)
- The site is based on a 'green field' with no abnormal ground conditions
- Contract periods are based on:
 - 21 weeks (Options 1a and 2a)
 - 24 weeks (Options 1b and 2b)
 - 30 weeks (Options 1c and 2c)
- Contingencies are a nominal allowance
- External works area assumed to be minimal being adjacent to existing facilities
- Incoming services assumed to be available from existing supplies.



Cost plan for the building options

This table should be read in conjunction with page 22.

Elemental cost estimate	OPTION 1a		OPTION 1b		OPTION 1c		OPTION 2a		OPTION 2b		OPTION 2c	
	4 court Sports hall		4 court Sports hall + changing		4 court Sports hall + changing + small health and fitness		5 court Sports hall		5 court Sports hall + changing		5 court Sports hall + changing + small health and fitness	
Gross internal floor area (GIFA)	850m ²		1,087m ²		1,532m ²		1,055m ²		1,289m ²		1,722m ²	
	Elemental cost £	£/m ²	Elemental cost £	£/m ²	Elemental cost £	£/m ²	Elemental cost £	£/m ²	Elemental cost £	£/m ²	Elemental cost £	£/m ²
Substructure	124,000	146	148,000	136	210,000	137	153,000	145	177,000	137	238,000	138
Superstructure												
Frame	74,000	87	118,000	109	165,000	108	91,000	86	138,000	107	184,000	107
Upper floors	-	-	6,000	6	6,000	4	-	-	6,000	5	6,000	3
Roof	107,000	126	130,000	120	182,000	119	130,000	123	151,000	117	203,000	118
Stairs	-	-	6,000	6	6,000	4	-	-	6,000	5	6,000	3
External walls	94,000	111	111,000	102	117,000	76	108,000	102	123,000	95	124,000	72
External windows & doors	28,000	33	30,000	28	64,000	42	28,000	27	30,000	23	64,000	37
Internal walls and doors	51,000	60	100,000	92	207,000	135	53,000	50	108,000	84	220,000	128
Elemental total	354,000	416	501,000	461	747,000	488	410,000	389	562,000	436	807,000	469
Internal finishes												
Wall finishes	84,000	99	99,000	91	119,000	78	93,000	88	111,000	86	131,000	76
Floor finishes	74,000	87	86,000	79	121,000	79	92,000	87	105,000	81	137,000	80
Ceiling finishes	3,000	4	10,000	9	26,000	17	3,000	3	11,000	9	26,000	15
Elemental total	161,000	189	195,000	179	266,000	174	188,000	178	227,000	176	294,000	171
Fittings												
Elemental total	49,000	58	76,000	70	92,000	60	55,000	52	91,000	71	100,000	58
Services												
Sanitary appliances	2,000	2	14,000	13	25,000	16	2,000	2	14,000	11	25,000	15
Disposal installations	inc below		inc below		inc below		inc below		inc below		inc below	
M&E installations	150,000	176	198,000	182	298,000	195	186,000	176	236,000	183	327,000	190
Specialist installations (PV)	54,000	64	24,000	22	24,000	16	57,000	54	30,000	23	30,000	17
Builder's work in connection	8,000	9	10,000	9	15,000	10	10,000	9	12,000	9	17,000	10
Elemental total	214,000	252	246,000	226	362,000	236	255,000	242	292,000	227	399,000	232
Building sub-total	£902,000	£1,061	£1,166,000	£1,073	£1,677,000	£1,095	£1,061,000	£1,006	£1,349,000	£1,047	£1,838,000	£1,067
Preliminaries	141,000	166	165,000	152	203,000	133	147,000	139	169,000	131	209,000	121
BASE CONSTRUCTION COST	£1,043,000	£1,227	£1,331,000	£1,224	£1,880,000	£1,227	£1,208,000	£1,145	£1,518,000	£1,178	£2,047,000	£1,189
Additional cost allowances												
Contingency allowance	30,000	35	40,000	37	50,000	33	30,000	28	40,000	31	50,000	29
Professional fees allowance	80,000	94	90,000	83	120,000	78	80,000	76	90,000	70	120,000	70
External works notional allowance	15,000	18	15,000	14	20,000	13	15,000	14	15,000	12	20,000	12
Incoming services / stats provisional allowance	10,000	12	15,000	14	20,000	13	10,000	9	15,000	12	20,000	12
Typical sports hall equipment costs	45,000	53	45,000	41	45,000	29	55,000	52	55,000	43	55,000	32
Additional costs total	180,000	212	205,000	189	255,000	166	190,000	180	215,000	167	265,000	154
OVERALL ESTIMATED PROJECT COST	£1,223,000	£1,439	£1,536,000	£1,413	£2,135,000	£1,394	£1,398,000	£1,325	£1,733,000	£1,344	£2,312,000	£1,343

Procurement and Delivery

Introduction

This section identifies high level procurement options for this scale of facility. It is intended to be generic and should be read in conjunction with the *Sport England Procurement Toolkit* that provides significantly more detail, including template contract documentation and guidance. This, nor the toolkit, will replace the need for quality specialist advice, though it may enable clearer, more focused briefs to be developed to ensure that consultants are deployed as effectively as possible in the procurement process.

Influencing factors on procurement will include attitude to risk, affordability, timescale, control over design and market interest amongst others. It is assumed that this type of facility will typically be developed by the public sector, e.g. a Local Authority (school) is likely to be the client, albeit the principals and best practice processes can be adopted by other employers / clients.

Procurement generally

There are a number of procurement roles to be fulfilled in delivering a successful project. The level of client in-house resource and expertise may, in some instances, be limited so consideration will need to be given to additional external support requirements, including some or all of the following:-

- Project management (whether internal or procured externally) and reporting structures
- Financial advice
- Legal advice
- Construction
- Technical advice (professional team: Architect / construction Project Manager / Cost Consultant / other technical disciplines)
- Leisure / Operator advice

This overview comments only on the construction and related consultant technical team appointments. In instances where leisure operators are involved, the timing of the potential input of a leisure operator should be considered.

Contractor and Consultant Frameworks

There are a number of construction frameworks used across the United Kingdom. An advantage of using these is that a pre-qualification process will have already been undertaken in accordance with the Public Procurement Regulations. In the case of contractors, the framework will have a selected list of main contractors from which a number may be invited to tender the works. The use of frameworks should be considered in the project Procurement Options report.

Similarly for consultant team appointments, Sport England encourages public sector clients to review available framework agreements that have the ability to contain sports and leisure experience. This can reduce delivery timescales and potentially reduce costs.

The importance with any appointment is to ensure that the consultants and contractors on these frameworks have the requisite sports and leisure skills, expertise and experience.

Sport England has been leading on the development of a standard suite of documents for leisure operator procurement as a 'toolkit' of documents. Please refer to the Sport England website *Facilities and Planning, Tools and Guidance, Procurement, Toolkit*.

Construction

The procurement route selection is critical to the success of any construction project. Every project has unique requirements and therefore all viable procurement options need to be appraised at the beginning of the process. A Procurement Options report should be prepared with all key project criteria evaluated to inform the selected approach.

There are often two key project elements that need to be procured to deliver a new leisure facility. The first is the delivery of a new capital build project and the second is the management and operation of the facility. Procurement of these two elements can be considered separately or as a combined / joint approach. This document considers the delivery of the construction of the leisure centre. For information in relation to operator procurement please refer to Affordable Sports Centres (ASC 25m or 50m pools).

The scale of these facilities is such that thresholds should not be reached triggering EC procurement requirements.

This document is not intended to provide exhaustive general procurement information, but identifies potential routes that may include:-

- **Traditional**
- **Design and Build - Single or Two Stage**

Traditional

In the traditional design and build construction project, the client enters into contracts with a design professional (typically an architect) to design the facility.

Other consultants may be employed as 'sub-consultants' to the Architect or direct by the client, for example engineers to assist in the development of the design stages. The client will typically also appoint a Cost Consultant and Project Manager, together with other specialist input as required. When the design is complete and approved by the client, tender documentation is prepared by the professional team and tenders are solicited from building contractors. The client then enters into a separate contract with a building contractor for a fixed price to construct the facility. The client retains their professional team.

Design and Build

Given the scale and proposed value of the facility in this review, both single and two stage design and build approaches could be considered.

- **Single stage design and build**

Single stage Design and Build has formed a significant part of the market for delivery of sports / leisure facilities over the past decade. Typically, the design is developed by the successfully procured Design Team to RIBA stage 3 (Developed Design) at which point the works are typically tendered to the construction market. This is sometimes referred to as a 'Develop and Construct' procurement route due to the more advanced stage of the design prior to tendering.

- **Two stage design and build**

Whilst there are many variations of this approach, typically the process involves the selection of building contractors to bid based upon their preliminary costs, overhead and profit (based upon RIBA stage 2/3), together with qualitative requirements. Following evaluation, the preferred contractor moves to a second stage where they progress the design and cost with a team. This then has contractor input on buildability with supply chain participation. The

latter option provides more cost certainty and is normally quicker to procure.

Consultant procurement

As stated under Frameworks section above, Sport England encourages public sector clients to review established Frameworks. If a client is not satisfied that a framework has consultants with the required experience, it should select appropriately qualified and experienced professionals to participate through a competitive route.

The scale of these facilities is such that thresholds should not be reached triggering EC procurement requirements.

Dependent upon contractor procurement, it is recommended that the client retains or employs separately, some client side expertise in relation to specialist installations. For example, on a design and build route, the client will most likely retain the cost consultant and or Project Manager. These costs should be factored in to the overall business case.

Construction programme

Outline indicative programmes have been considered during the review of the six sports hall options contained in this document. These show that the stand-alone 4 or 5 court sports hall options could be completed within 13 months of the decision to progress the scheme, using a Design and Build procurement route.

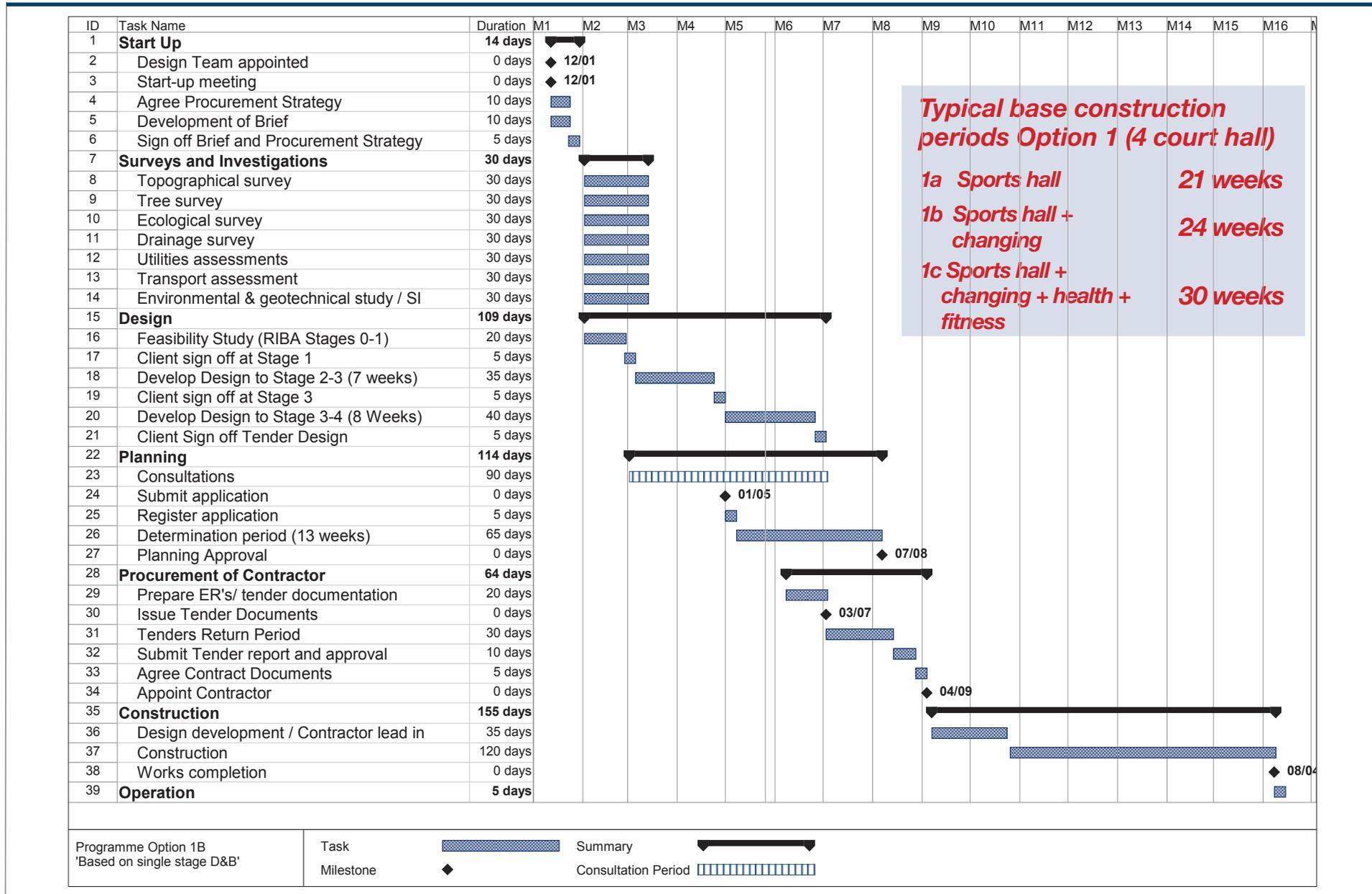
The introduction of other facilities, such as the changing and health and fitness accommodation, may increase this period, with these options delivered within 14.5 - 16.5 months. The method of procurement will also have an impact on the overall programme and the two will need to be carefully balanced.

An indicative programme for the 4 court hall, plus changing (Option 1b) is shown overleaf. This is an outline indicative programme and would need to be developed by the appointed Project Manager to further break down each stage of the project and to provide a more detailed analysis of the design development, approvals and key stage sign-off, planning and consultation strategy.

The programme assumes a construction period of 24 weeks for the 4 court hall (Option 1b) with changing building with an overall programme period of around 14.5 months.

A new sports hall can be opened within 13 to 16.5 months

Example of a 15.5 month programme for a 4 court sports hall + changing (option 1b)





Creating a sporting habit for life

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.

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 '**Design and Cost Guidance**'

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