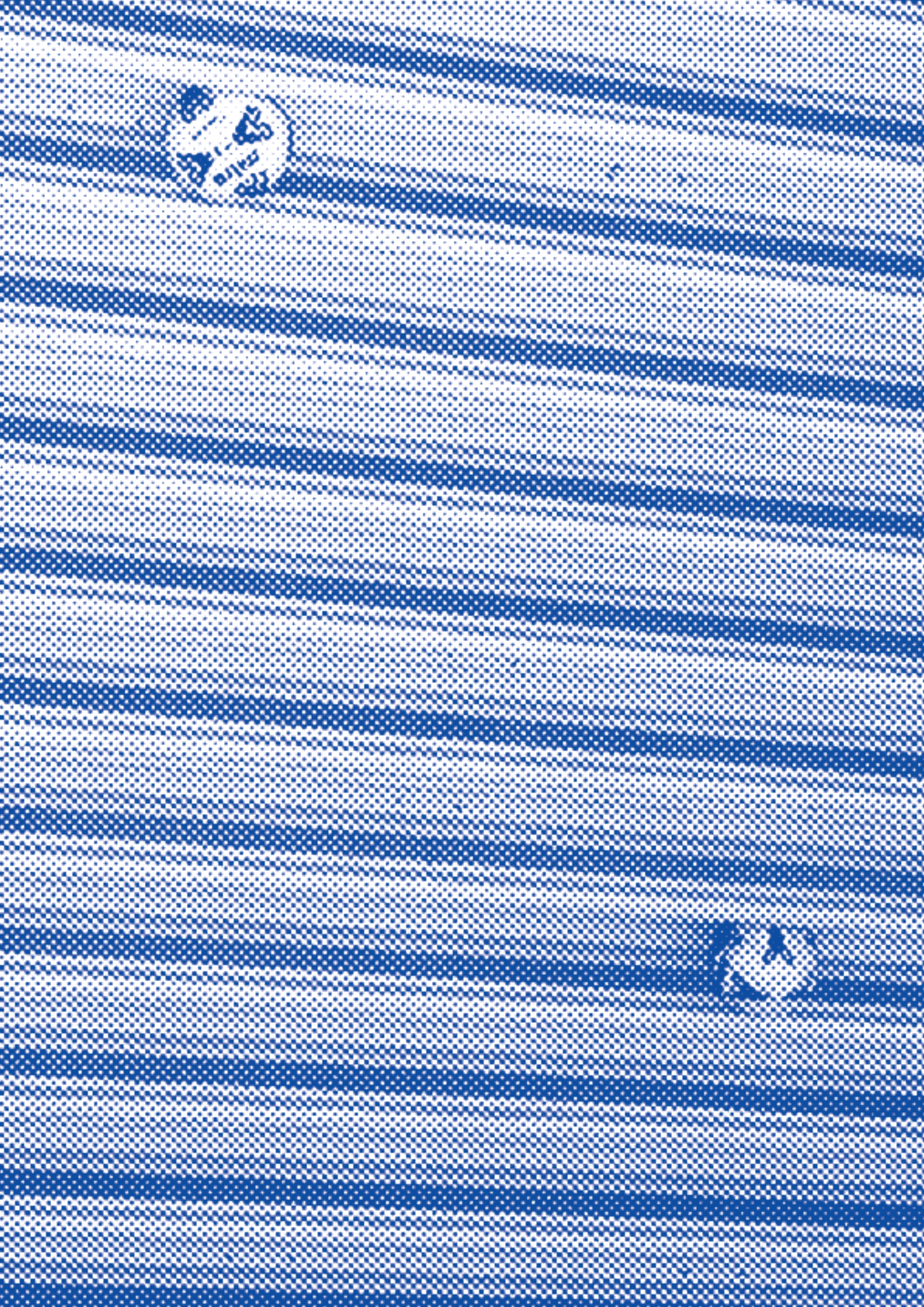
Design Note 3: Gymnasium

sportscotland



Gymnasium

Use

Use of the gymnasium by the school will be for the teaching of school-based gymnastics and a range of skills practice for other activities. School-based gymnastics teaches pupils the principles of flight, rotation and balance and requires a range of specialist equipment. Although some of the functions of the gymnasium can be accommodated in a sports hall, the teaching environment is less than ideal.

Community use of this space will to a large degree depend on the programming of the other spaces and the levels of demand for all the activities offered at the school. Keep fit, martial arts and similar classes are likely to account for a large part of the use of this space. Some non-sports uses such as drama rehearsals may also be expected.

Suggested Dimensions

Length: 19m Width: 14m

Height: 6.7m (min. unobstructed height above activity area)

These dimensions, while not critical, are suitable for the range of activities in school-based gymnastics and provide a reasonable sized area for other school and community activities. The height of 6.7m allows badminton to be played in this space if required.

Floor

A sprung or semi-sprung floor is required for the gymnasium to cushion impact between body and floor, and the floor should conform to BS:EN14904.

- The floor surface should be non-slip, non-abrasive and offer good traction;
- It should be resistant to wear, impact, indentation and require minimum maintenance;
- Floor finishes should be light in tone and warm in colour;
- A smooth 'warm' finish such as wood is recommended for comfort and ease of movement, much of which will be done with the body in contact with the floor.

Some gymnastic equipment may need to be bolted down, and it is therefore essential that the floor is capable of accommodating sufficient sockets in the appropriate locations.

It is important to consider any non-sporting school or community uses for which the gymnasium may be used and ensure the floor will not be damaged by chairs or other equipment.

Due to the variety of likely uses for this space, there should generally be no markings on the gymnasium floor. The space is, however, large enough to accommodate a single badminton court, and this could if required be marked out on the floor, although the lines may prove somewhat distracting during other activities. Alternatively, a roll out badminton court could be provided.

Walls

In addition to school-based gymnastics, the gymnasium may be used for a variety of sports activities. Walls therefore have to be resistant to the impact of projectiles and bodies. They must not interfere with use of the space and their detailing must avoid ledges below 3m and avoid all projections. They will also have to support and house fixings for gymnastics equipment.

The wall construction and finishes specified should therefore:

- Be capable of withstanding heavy impact with a surface which avoids flaking, dusting or discolouration;
- Be non-abrasive for a minimum height of 3m. Any pointing between block-work or brickwork should be flush;
- Avoid recesses and projections such as columns, rainwater pipes, service conduits, switches and power sockets;
- Provide adequate support for gymnastic equipment;
- Avoid ledges which harbour dust and projectiles.

Colour, Contrast and Glare

Background contrast to moving objects and the control of glare must be considered. Excessive changes in colour and materials should be avoided and the light reflectance value of the materials should be around 30% to 50%. A matt finish is recommended.

Ceiling Zone

The ceiling zone must accommodate fittings for equipment and elements of lighting, ventilation and acoustic control and also:

- Must be without ledges or recesses which may trap projectiles and harbour dust;
- Must be capable of withstanding the impact of balls;
- Should be constructed to take account of the requirements of the lighting system and fittings required for ropes and gymnastics equipment;
- Should be designed to achieve the necessary acoustic conditions.

Colour and Contrast

The choice of colours and tones used in the ceiling zone must minimise contrast between light sources and other surfaces. Generally, ceiling zone fabrics should therefore have matt finishes and be light in tone, with a light reflectance value of close to 90%. It is essential that any projectiles used in activities can be clearly seen at all times.

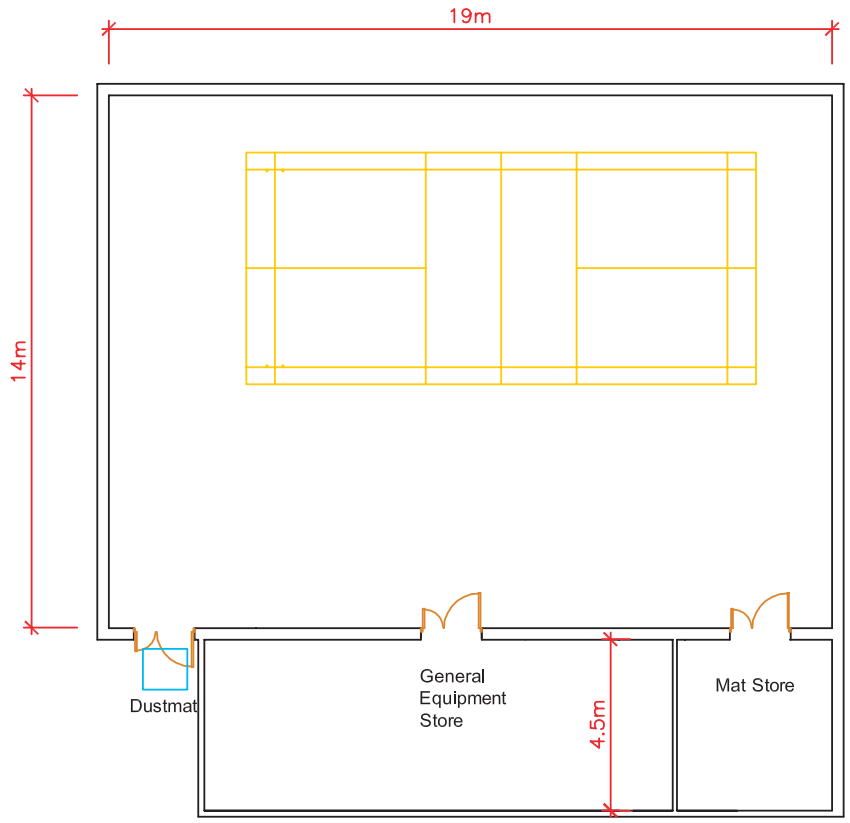
Fixings for Equipment

Structurally adequate fixings for equipment, safety harnesses, light fittings and so on must be incorporated without impinging on the minimum unobstructed height over the activity zone. The relationship between roof mounted equipment, light fittings and ventilation ducting should be carefully considered. School based gymnastics requires flexibility in the grouping and layout of equipment in order to provide a variety of testing situations for pupils and the roof structure must be able to accommodate this, where possible using the primary steelwork.

The flexibility of this space may be increased by installing recessed sockets on the end and/or side walls of the hall, across which a net may be strung. Having an adjustable net height may allow some skills practice for badminton, netball and short tennis for a range of age groups.

Environment

The gymnasium should have its environment controlled centrally - local occupant control is discouraged. It is important that installed services are simple to operate and easy to maintain.



Optional Badminton
Court
(requires minimum
ceiling height of 6.7m)

Drawing 03: Gymnasium

Lighting

Lighting must deliver consistent levels of illumination, good colour rendering and avoid glare. A fundamental decision is whether natural lighting should be incorporated. Introducing natural light can cause problems due to glare and contrast. However, its use can help create a more pleasant environment and reduce energy consumption. It is recommended that natural lighting is utilised provided the detailed design can avoid the problems above. Reference should be made to 'Daylighting of Sports Halls' (**sport**scotland, 2002). Updated version June 2009.

Natural light should be introduced into the gymnasium where possible. Blinds may be required to control glare and to provide privacy when required. Blinds should be incorporated within the cavity of the glazing units in the windows/screens.

The lighting control room should be located within the office or staff base. For most school and recreational use an illuminance level of 300 lux should be sufficient, with the facility to lower levels for cleaning, maintenance and non-sports uses.

The lighting design for the gymnasium should therefore take into account the following issues:

- Integration with natural lighting;
- Luminaires should have wire guards or another form of impact resistant cover;
- Lighting requirements of any non-sports activities taking place in the hall;
- Controls should be simple but incorporate energy saving measures;
- Luminaires should be multi-lamp or be capable of being dimmed;
- The requirement for safety lighting.

Heating and Ventilation

An overall minimum temperature of 12ºC to 16ºC will satisfy most users but temperatures up to 20ºC may be required for short-mat bowls, social use and activities such as art, dance and drama.

A ventilation rate of 2 air changes per hour is likely to be required, although this requirement will be higher if the gymnasium is required for aerobics classes and similar. This rate should be checked against summer cooling rates and occupancy rates.

Acoustic Considerations

A maximum reverberation time of 1.5-1.8 seconds at 500Hz with a background noise level of NR 50 is recommended. Shorter reverberation times, if they can be achieved, would improve the teaching environment. If sound absorbent material is to be incorporated, it is desirable to concentrate it within the ceiling zone. Wall surfaces above 3m can, however, be used to enhance the acoustics. Impact resistant acoustic panels or acoustic masonry blocks may be considered.

The gymnasium should be designed to achieve a 40dB reduction in noise level between it and any adjoining teaching space. Users with hearing impairment may benefit from a hearing enhancement system or induction loop.

Fixtures and Fittings

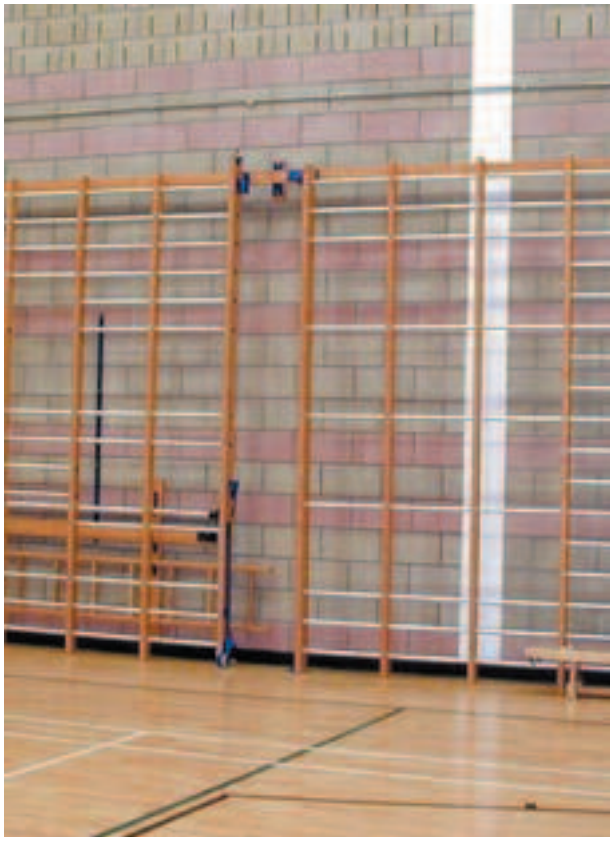
Doors

Access and fire exit doors should open out from the gymnasium. These openings increase the potential for injury to users and therefore must be treated with care. The positioning and design of doors should:

- Eliminate sharp and potentially dangerous corners in the activity zone;
- Ensure that all doors and frames are flush with the internal wall surfaces;
- Take account of the width and height of portable equipment and allow sufficient space for people to safely transport such equipment through door openings;
- Provide a suitable internal rebound surface which is flush with the adjoining wall surface. Rebound panels can be fitted above and below panic bolt pressure bars to produce a flush surface.

Windows and Internal Glazed Screens

Windows and internal screens should be flush with the internal wall finish, be constructed of safety glass and be located to minimise distraction. Glazed screens should be double glazed with blinds between the glass panes for privacy. Blinds should be operated from within the hall using flush-fitting controls.



Gymnastics Equipment

School based gymnastics requires a range of specialist equipment, fixed and moveable, large and small. Fixed equipment such as ropes, rings and safety harnesses will generally be secured to the ceiling/roof. Sufficient window ladders/wall bars are also required for certain activities and for supporting some equipment. A large range of moveable equipment is required, including horizontal bars, trampolines and trampettes, beams, horse, buck, high tables and movement tables, boxes, spring and beating boards, benches, boxes, mats, roller mats and mat trolleys and planks. Heavy items of equipment should be fitted with wheels or trolleys enabling them to be easily and safely transported and then securely locked when in position.

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