PART 9
MUSIC

9.1 Introduction

Accommodation for music needs to provide for a curricular programme consisting almost entirely of practical music making including the following activities:

a. practising and performing on a musical instrument or voice; this may involve the whole class together, individuals, pairs or small ensembles working simultaneously or performing to each other in audience;

b. improvising music, composing and recording; these activities may also be individual, in groups or whole class;

c. listening to live and recorded musical performances, occasionally as individuals using headphones, and appraising them through discussion.

The two major considerations at the planning stage are:

a. acoustics: the pupils must be able to hear their own work clearly, suitably enhanced by an appropriate acoustic environment, but without the distraction of sounds made by others, or from external sources; they also must be able to make good quality recordings.

b. an environment approaching that of a professional studio, rather than that of a traditional classroom, designed and furnished with flexibility, so that pupils can organise themselves in different ways to suit different activities.

In addition, one or more visiting tutors will provide individual or group tuition in musical instruments for some pupils as part of the extended curriculum.

It is normal for the music accommodation to be much in demand for daytime activities outside the normal timetabled arrangements, and occasionally for evening and weekend activities.

The main uses of the computer in the music suite will include:

- composing, performing and sound editing, linked via MIDI to instruments, microphones and audio equipment, using both speakers and headphones;

- internet research, including the downloading of MIDI and MP3 files;

- word processing and printing.

9.2	Liaison with the Education and Library Boards	Rapid development in the musical world, particularly in relation to music technology and commercial music, should be reflected in the music curriculum in schools. Given the importance of compatible and up-to-date equipment, as well as related health and safety considerations, it is important that guidance and agreement are obtained from the specialist adviser in the relevant curriculum and advisory support service (CASS).
9.3	Maximum Class Size	Maximum class sizes are normally 20 (Regulation 15, Secondary Schools (Grant Conditions) Regulations (Northern Ireland) 1973; Circular Number 2001/14). Other recommended class sizes are: for GCSE examination classes: 15 pupils; for AS/A2 examination classes: 12 pupils. Guidance on floor space per pupil is given in Ref 1 (see 9.14 ESSENTIAL REFERENCE MATERIALS).
9.4	Health and Safety	A wide variety of instruments will be used, including classroom and professional acoustic and electronic instruments from any musical style or culture. Music technology also includes instruments linked together and/or to computers via MIDI (Musical Instrument Digital Interface) and to sophisticated recording facilities via microphones and direct line inputs; much of the music the pupils perform will be recorded. Guidance on health and safety considerations can be found in 9.14 – Ref 1.
9.5	Refurbishment of Existing Premises	For useful case studies of adaptations to existing premises see 9.14 Ref 3, pages 43-47.
9.6	Fire Fighting Equipment	Items of fire fighting equipment must be provided to satisfy the requirements of the Building Control Authority.

9.7 FUNCTION

9.7.1 ACCOMMODATION The Schedule of Accommodation will take account of the need to provide for:

a. the teaching of music to classes in key stage 3, key stage 4, and sometimes the sixth form;

b. teaching smaller groups preparing for AS and A2 examinations;

c. tuition of individuals and small groups of pupils in the playing of band, orchestral and keyboard instruments or voice, usually by visiting tutors;

d. individual practice, which may involve the use of instruments linked to a computer;

e. rehearsals of small groups – such as, a string quartet, brass choir or rock group;

f. rehearsals of large groups - such as an orchestra, band or choir;

g. public performance;

h. storage of musical instruments; a range of audio-visual technology, including permanently mounted audio equipment and computers; books, scores, files and teaching materials; and recordings.

The accommodation must allow individuals and small groups to make independent music simultaneously, being able to hear their own work clearly and with minimal sound interference from others. It must also allow for satisfactory individual monitoring and supervision by the teacher.

The accommodation will comprise the following:

a. a teaching unit for one teacher consisting of a standard music studio and three smaller group rooms; these should open off the studio, and will require careful acoustic detailing; the standard music studio should also suit the rehearsal needs of the school choir and a small orchestra;

b. additional, teaching units for the second and subsequent music teachers consisting of a smaller music studio, also with three group rooms;

c. a recording studio, attached to each studio, which may be provided by adapting a group room for dual usage, or by provision of a separate space.

d. a minimum of two (see Schedule of Accommodation) different-sized practice/ensemble rooms to accommodate individual and group instrumental tuition and rehearsal; one of these should also be able to accommodate some teaching of smaller examination groups, so reducing demand on a main studio, as well as private music study and/or curricular use of music technology by small groups of senior pupils.

e. stores:

i. for instruments not permanently stored in the studios and other equipment available in larger numbers, such as amplifiers, electronic effects units, acoustic guitars and smaller percussion stored on trolleys. These stores should be secure, and easily accessible from music studios, but not from the corridor;

ii. for pupils' own instruments being used in lessons and rehearsals during the day;

Some smaller items can be conveniently stored on shelving in the studios.

f. where scheduled:

- a departmental base (for suites with three or more studios) to be used by school and peripatetic teachers, for housing pupils' records and certain items of equipment.

- a keyboard laboratory or computer suite providing for a whole class to work simultaneously on electronic keyboards;

g. Rehearsals of larger groups and larger-scale performances will entail use of the multi-purpose hall or stage. It is a considerable advantage when these are adjacent to, or near to the music suite.

9.7.2 SIZE

Standard music studio		83 m^2
Additional music studios		67 m^2
Group rooms		10 m^2
Recording studio	(i)	18m^2 for separate studio
	(ii)	10m^2 for adapted group room
Practice/Ensemble rooms	(i)	24m^2
	(ii)	12m^2
	(iii)	18m^2
Instrument store(s)	(i)	20 m^2
	(ii)	12 m^2
Departmental base		16m^2
Computer suite/keyboard laboratory		35m^2
Foyer/display area		15m2 per studio

Circulation areas within the music suite must be wide enough to accommodate larger instruments being transported (see 9.14 Ref 1, p 6).

9.7.3 ACCOMMODATION The following table sets out the required accommodation for suites of various sizes.

Size of Suite	1 studio	2 studios	3 studios	4 studios	5 studios
Standard music studio	1	1	1	1	2
Additional music studios	0	1	2	3	3
Group rooms	3	6	9	12	15
Recording studio(s) or adapted group rooms	(i) 1 (ii) 1	(i) 1	(i) 1 (ii) 1	(i) 2	(i) 2 (ii) 1
Practice/ensemble rooms	(i) 1 (ii) 1	(i) 1 (ii) 1 (iii) 1	(i) 2 (ii) 1 (iii) 1	(i) 2 (ii) 2 (iii) 1	(i) 2 (ii) 2 (iii) 2
Stores	(i) 1 (ii) 1	(i) 1 (ii) 1	(i) 1 (ii) 2	(i) 2 (ii) 1	(i) 2 (ii) 2
Departmental base	0	0	1	1	1
Computer Suite/ Keyboard Laboratory	1	1	1	1	1

9.7.4 LOCATION

The music accommodation should be housed together in a suite to enable the head of department to co-ordinate the work and liaise with the visiting tutors. It should be located away from sources of external noise such as play areas and roads; and should not create sound transference problems for activities in other classrooms. Wherever possible, external double doors should give access, via a ramp, to an occasional van parking space.

The music suite should be located within a separate single-storey block linked to the main school and close to the multi-purpose hall. This has the advantage of minimising acoustic interference between the suite and other parts of the school. The link to the main school building should afford suitable protection to instruments being transported in poor weather. A separate building is not always possible in refurbishment schemes. If the department is an integral part of the main school, it should be located so as not to cause or suffer sound interference, preferably as a linked single-storey block, or at the end of a wing - this arrangement can also allow provision for direct external access to the music facilities for public performances. Consideration should be given to the location of the music suite in relation to other subjects with related areas of study; see paragraph 4.11 and Appendices 4 and 5.

9.7.5 LAYOUT

9.7.5 (i) THE SUITE:

The integrity of the suite is vital, and it should not contain through circulation to and from other parts of the school. A double-leaf doorway should be provided at the entrance to the suite to minimise sound transference; if the suite is linked to the main building a dual -doored sound lobby may be needed (see 9.14 Ref 2 and Ref 3, p 34).

Acoustic considerations are crucial. These will take account of:

a. the location of rooms in relation to each other, and to other parts of the school;

b. acoustic insulation; and

c. the proportions and surface finishes of the rooms.

Stores and other 'dead' spaces should be used to provide sound buffers between rooms. The thickness, angle and height of dividing walls, the construction and sealing of doors and windows, an absence of continuous beams and internal water pipes, and the provision of silent heating, lighting, ventilation and water services are also important factors. See 9.12.1 ACOUSTICS and 9.13 MECHANICAL AND ELECTRICAL SERVICES.

The department will house many valuable instruments, some of which are large - and attractive - electronic items. While good natural light is highly desirable, the location and security of windows and means of access need careful consideration. Rooflights can present a security risk if not carefully designed. Corridors should be carpeted and provide good facilities for the display of information.

9.7.5 (ii) MUSIC STUDIOS AND GROUP ROOMS

Each teacher-unit consists of a studio and at least three group rooms, one of which may double as a recording studio.

Studios need to offer maximum flexibility of use; some fixed furniture is desirable, but it should not limit the working space.

For good acoustics, studios should not be square in plan or section (or symmetrical shapes such as octagons which are derived from squares); but irregular plan shapes (eg 'L' shapes) should also be avoided. Nor should they be over-long and narrow, although the standard music studio (83 m^2) needs a sufficiently oblong shape to suit performance to an audience. Extra height can usefully be achieved by using some of the space within a pitched roof, but symmetrical geometric forms will not be suitable if they cause undesirable sound focusing (see 9.12 Ref 3, pages 37-40).

The teaching wall should be at 90° to a window wall. Audio equipment, whiteboard and a suspended screen should be mounted in this area. Some standing-height fixed benching should be provided in the studio, with display boarding above; mobile or fixed storage should be provided below to accommodate items such as small instruments, headphones, tapes, CDs and books. See sketch M6 for storage requirements for recordings, for which proprietary storage may alternatively be provided.

Easy access to electrical sockets installed in trunking around the studio should facilitate the use of keyboards on stands, or specially designed computer-and-keyboard desks around the perimeter of the room (see Ref 1, p 4). Microphone and direct line inputs to the recording studio should also be distributed around the room. In the standard music studio, provision for full-length heavy drapes to vary acoustic response should be considered.

Group rooms may be accessed from the teaching wall end of the studio. To reduce sound transmission, each room should have one non-parallel wall, angled between 5° and 10°. For further details regarding sound separation, see 9.12.1 ACOUSTICS.

9.7.5 (iii) RECORDING STUDIOS

Recording studios and group room(s) designated for recording should have a double-glazed observation window to provide maximum vision of the adjoining music room. They will be equipped with sophisticated equipment allowing multi-track recording, mixing and processing of sound, and a computer and keyboard. Microphone and direct line connection points to the recording studio should be provided at four points in each studio: in standard music studios, 4 by 2 microphone and one line, and in other studios, one microphones and one line. Provision should be made for speech and play-back to be transmitted from the recording desk to the studio through the audio system loudspeakers.
There should be no external window in recording studios.

9.7.5 (iv) PRACTICE/ ENSEMBLE ROOMS

These rooms should be of different sizes
They should be neither square nor long and narrow. As with the group rooms, one wall should be non-parallel, angled between 5° and 10°. All practice/ensemble rooms should have natural light.

One of the rooms may accommodate music technology similar to that in the recording studio; it should include some shelving. Furniture is likely to be limited to chairs and music stands and perhaps a large percussion instrument. Each room should have a full-length mirror on one wall and coat hooks. Wasted space should be minimised by siting the door near the corner.

9.7.5 (v) STORES

(i) The store for instruments and equipment for class use should be accessible directly from the studio. Where the store serves 2 studios, the doors should not be opposite each other, to minimise sound transference. For security reasons, access to the instrument store should not be provided from any other space including circulation areas. Maximum flexibility is needed in shelving adjustment to house both large/small, and heavy/light instruments (see Paragraph 9.9.2 SHELVING). Lockable cupboards are required for items such as instrument repair tools, parts and equipment. The distance between shelving on facing walls should be at least 1.2 m to allow several pupils to access equipment at the same time, and two people to manoeuvre larger instruments such as a drum. A minimum of 1.5 m free wall space should be available for the storage of an instrument

trolley. The position and swing of the door should not obstruct shelving.

(ii) The smaller store, for pupils' own instruments should be secure. It may be accessed from the corridor or from the main studio. Fully adjustable shelving should cater for a variety of instruments.

9.7.5 (vi)	DEPARTMENTAL BASE (where Scheduled)	Adjustable shelving should be provided on one wall. A window to the corridor must be provided, either in the wall or in the door.
9.7.5 (vii)	COMPUTER SUITE/ KEYBOARD LABORATORY	This should provide for a minimum of ten specially designed workstations/desks (non-contract) each housing a keyboard and computer, with an additional workstation for the teacher who may also need a monitoring system and a printer. SEE ALSO PART 12 ICT.

9.8 PERFORMANCE

9.8.1	FLOOR, WALL& CEILING FINISHES	See 19.12.1 ACOUSTICS.
9.8.2	WALLS	Sound insulation between all music-making areas is important and should be determined by reference to Building Bulletin 87 Ref 2). Studios and practice/ensemble rooms should preferably not share a common wall. The acoustic integrity of partitions should not be compromised by the structural and M&E services installations.
9.8.3	DOORS	To permit access for bulky instruments, doors should have a clear opening width of 900mm. For added security, doors to the instrument store should be outward-opening. Doors to studios, group rooms, recording studios and practice/ensemble rooms should be acoustically sealed when closed. Doors should be heavy and solid-cored, with perimeter and threshold compression seals. Keyholes should be avoided wherever possible. A small, triple-glazed, vision panel should be provided in doors to group rooms and practice/ensemble rooms.
9.8.4	WINDOWS	External windows should be hermitically sealed double-glazed; the gap between panes should be at least 16 mm. Opening lights should be acoustically sealed when closed and, where possible, face away from other teaching, office or staff accommodation. Window provision should be sufficient to provide satisfactory natural lighting where required. Windows should have opening lights at high and low level to provide adequate natural ventilation with fine adjustment.

Observation windows in the recording studio(s) should be double-glazed with a cill height 1.1 m above floor level. The vision panel should extend to 2.1 m above the floor level. The panes should be heavy plate glass of different thicknesses, mounted in a neoprene gasket in separate frames and separated by an air gap of 100-150 mm. Ideally, one pane should be installed at 5° off parallel to prevent prominent resonance. Acoustically absorbent material such as melamine foam should be incorporated into the reveal to absorb energy entering the air gap.

Rooflights should not be provided to avoid unwanted noise from rain.

9.9 FURNITURE AND FITTINGS

(provided under the building contract)

9.9.1 BENCHING

In studios: fixed benching 600mm deep at a height of 850mm should be provided, with built-in cupboard units under.

In recording studios: benching with storage below should be provided on a non-observation window wall. Recording equipment should either be housed on a portion of built-in benching or on a suitable trolley (non contract). The benching should be 720mm high with knee space and tray storage below.

9.9.2 SHELVING

In studios. Adjustable shelving 250 mm deep may be provided above perimeter benches Headphones may be suspended beneath shelving or on a separate panel.

In group rooms doubling as recording studio. Shelving and/or tray storage above the observation window.

In a dedicated recording studio. Shelving above benching on non-observation window wall.

In one practice/ensemble room. Adjustable shelving from floor to ceiling should be provided on one short wall. Five shelves are recommended: two at 500 mm and three at 300 mm.

In instrument stores. Instruments vary considerably in shape, size and weight. The largest and heaviest should be stored upright at floor level; these may include trombones and cellos in cases measuring from 950 mm by 300 mm by 250 mm to 1,500 mm by 550 mm by 350 mm. Storage systems do not have to be sophisticated, but shelving should be full height, and most should be fully adjustable. Storage for keyboards and guitars should also be provided in accordance with the details on sketch M6.

9.9.3 HIGH LEVEL CUPBOARDS — In Studios. High level cupboards with adjustable shelving may be provided above perimeter benching. Headphones may be suspended beneath cupboards or on a separate panel.

9.9.4 WHITEBOARD — A whiteboard with ruled music staves should be provided in each studio and the largest practice/ensemble room.

9.9.5 PROJECTION SCREEN — An inclined ceiling mounted projection screen should be provided in each studio, and in the largest practice/ensemble room.

9.9.6 DISPLAY BOARDING — Materials such as mineral wool foam and a fabric finish can be acoustically effective as well as enhancing the visual environment. A quantity of display boarding should be provided in each studio and in the circulation areas. Some should also be provided in each practice/ensemble room.

9.9.8 PROVISION FOR AUDIO EQUIPMENT — Facilities for a good quality surround-sound system comprising tuner, minidisk recorder, cassette tape recorder, CD player, turntable and amplifier shall be provided in a purpose made built in cabinet in each studio. The associated speakers should be permanently wired and mounted at the four corners above a height of 2 m.

9.9.9 MIRRORS — A full-length mirror is required in smaller practice/ensemble rooms.

9.9.10 SINK — A sink unit with hot and cold water should be provided in the large instrument store.

9.10 EQUIPMENT
(not provided under the building contract)

9.10.1 INTERACTIVE WHITEBOARDS — One wall mounted interactive whiteboard, and associated ceiling mounted data projector may be provided in each studio (where these can be funded from within the approved equipment budget).

9.11 **MOVABLE FURNITURE**
(not provided under the building contract) — The relevant school authority should provide the following:

In each studio:

- trolley keyboard stands; lightweight stackable chairs for pupils; music stands; computer-and-keyboard desks as required;
- an acoustic or electric piano and adjustable stool;
- a minimum of three computers for use by pupils;
- a teacher's computer linked to a MIDI keyboard

- a teacher's desk and chair;

- a teacher's workstation trolley

In group rooms:

- a lightweight, stackable double table of standing height (850 mm).

In recording studios:

- a trolley for recording equipment;

- a computer with a workstation trolley;

- an adjustable swivel chair.

In one practice/ensemble room:

- an acoustic or electric piano and adjustable stool;

In the departmental base:

- a teacher's desk and chair for the teacher's base when provided.

Within the music suite:

- an instrument trolley;

- two four-drawer filing cabinets, plus one for each additional teacher.

Movable display screens may be needed depending on the shape of circulation areas and the provision of fixed display boarding.

9.12 ENVIRONMENT

9.12.1 ACOUSTICS

Both the acoustic environment of teaching spaces and sound separation between groups making music simultaneously need to be a priority at an early stage in the building design. Further, a good level of sound insulation is required not only within the music suite but also between it and adjacent accommodation, corridor areas, building plant and public spaces. This should include the space above any suspended ceilings; this is particularly important for recording purposes. Special consideration is necessary if accommodation has to be provided above or below the music suite. It is advisable to consider seeking the advice of an acoustic consultant.

The shape and structure of all music-making areas should be conducive to good diffusion of sound, giving an appropriate balance between fullness of tone and clarity. Reverberation time (see 9.14 Ref 2) should be a little higher than that desirable for speech and

constant over the mid to high frequency range. To optimise reverberation characteristics, internal floor, wall and ceiling surfaces should include absorbent and reflective surfaces. A critical factor is volume, which may be obtained by increasing ceiling height in studios and practice/ensemble rooms. Normally, studio ceilings should be sound-reflective, and plenty of soft display boarding should be provided on the walls. Display boarding is best offset from the wall by about 5° to break up sound waves. Final floor surfaces should be decided after sound tests have been carried out by the ELB Adviser with other finishes complete. Normally, a sound-reflective ceiling will need to be balanced by carpeted flooring. For absorption characteristics and calculations see 9.14 Ref 2.

For group and practice/ensemble rooms a reflective ceiling, display boarding on walls and an anti-static carpeted floor are desirable finishes.

A carpet finish should be provided in circulation areas.

More detailed guidance is given in 9.14 Ref 3, pages 32-34.

9.12.2 DAYLIGHTING

A good level and distribution of daylight is required in all music-making areas. A dim-out facility should be provided for studio windows and as necessary elsewhere. Natural light is required to all practice/ensemble rooms.
Windows should not be provided in the instrument stores and recording studios.

9.12.3 TEMPERATURE

Generally 18°C throughout the department except the instrument store which shall be at a background level to avoid condensation.

9.12.4 VENTILATION

Good ventilation is required in studios and associated rooms to satisfy the needs of the occupants. As far as possible this should be achieved by natural means (see WINDOWS) however mechanical systems may be considered where background noise levels would be excessive or for internal rooms where natural ventilation is not available.

9.13 MECHANICAL AND ELECTRICAL SERVICES

As the facilities of the music department are often used by the school outside school hours, zoning of M&E services would be desirable.

9.13.1 VENTILATION

Mechanical supply and extract ventilation may be provided for classrooms, studios, rehearsal/performance spaces and recording studios etc. if background noise levels from external sources are excessive and natural ventilation techniques are inappropriate. If provided such systems should be concealed where possible and operate at an appropriate noise level.

9.13.2 HEATING

Ceiling panel, high level radiant panel or underfloor heating should be used wherever possible, complete with an appropriate thermostatic control. This control may be either a local tamperproof thermostatic

type or an electrically operated zone valve and associated sensor operated through a BMS.

Fan assisted convection heaters are not acceptable. It is unlikely that there will be adequate wall space to accommodate conventional radiators mounted at low level.

All store rooms should have high level heating coils.

All heating, ventilation and plumbing installations should be designed to the appropriate background noise level.

Zoning of mechanical heating services should be considered to facilitate the music department outside school hours.

9.13.3 LIGHTING: A maintained illuminance of 350 lux is required on the working plane in all areas of the suite. It should be noted that the working plane may be horizontal, vertical or inclined.

Lamps shall be specified with a colour rendering index (Ra) of not less than 80, with an intermediate colour appearance.

It is anticipated that there will be intermittent use of display screen equipment (DSE) in the keyboard laboratory and the lighting installation should be designed accordingly. It is considered that conventional luminaires will be sufficient to comply with the relevant guidance.

A small performance lighting installation shall be provided in the largest studio. This shall consist of a single 6-metre barrel with provision for six lanterns (four to be supplied), a patch cord unit and associated dimmer pack. The final layout of the system shall be as agreed with the appropriate ELB Adviser.

9.13.4 POWER SUPPLY: The following socket outlets should be provided:

In studios:

- two double sockets in the cupboard housing the audio equipment;
- three double sockets at skirting level on the teaching wall;
- outlets to service data projector and interactive whiteboard;
- twelve double sockets spaced evenly round the studio at 1 m height.

In group rooms:

- one double socket at 1 m height.

In recording studios:

- three double sockets below the observation window(s) and one on an adjacent non-window wall.

In practice/ensemble rooms:

- two double sockets on opposite walls at 1 m height.

In the main instrument store:

- one double socket.

In a computer suite/keyboard laboratory:

- two double sockets for the teacher's equipment;
- ten double sockets distributed around the room.

In departmental base:

- two double sockets;
- telephone point.

9.13.5 ICT — See PART 12

9.13.6 CONNECTIONS FOR INTERACTIVE WHITEBOARD SYSTEMS — Provision shall be made for the services necessary to connect the projectors and whiteboards that make up the interactive whiteboard systems as specified elsewhere. These shall include the electrical socket outlets for each projector and whiteboard and a trunking link to facilitate the interconnecting control/audio/video cabling.

9.13.7 WATER — A hot and cold water supply should be provided to the sink in the instrument store.

9.14 ESSENTIAL REFERENCE MATERIALS

Ref 1: Safety in Music; DENI (Circular 1999/7).

Ref 2: Guidelines for Environmental Design and Fuel Conservation in Educational Buildings (Design Note 17/Building Bulletin 87). DfEE (ISSN 0141 2825).

Ref 3: Music Accommodation in Secondary Schools: A Design Guide; Building Bulletin 86. DfEE (ISBN 0-11-271002-6).

See sketches for suggested layouts for music suites, a detailed layout indicating services and fittings and storage aspects.