The Highland Council
Comhairle na Gàidhealtachd

Advice on adaptations and design of new buildings to accommodate pupils with additional support needs

February 2013

Introduction

Things to consider when planning adaptations or new builds

This paper is intended to provide a starting point of issues to consider when planning a school adaptation or a new school build. It considers all the areas likely to impede the inclusion of a pupil with additional support needs. Best practice is to seek the advice of specialist services, occupational therapists, physiotherapists, moving and handling trainers, parents, and the pupils themselves when planning changes to the school environment to meet individual needs.
The issues are grouped under four main areas. If planning for a specific difficulty then just that section will require to be considered.

If there is to be a new build, we need to plan in anticipation of the full range of needs which the school may require to meet now and in the future.

If the school is to include a resourced base, then consideration of its position in the school is required. It should, wherever possible, not be placed near music departments or rooms containing noisy equipment e.g. woodworking or home economics. The unpredictable noises and smells can prove to be highly stressful to pupils with sensory issues.

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Should you require any further information on any aspect of this document – please contact:

Jane Baines
Development Officer Support for Learners
Education Centre
Castle Street
Dingwall IV15 9HU

jane.baines@highland.gov.uk

Considerations for Pupils with Hearing Impairments

Throughout the school:

There should be good acoustic separation between rooms to avoid sound spilling out.

Ceilings should have sound absorbing tiles (at least 85% of ceiling if they are to be effective.)

Soft furnishings will absorb sound and reduce reverberation time (echo). The greater the reverberation time, the poorer the listening environment. Reverberation time should ideally be below 0.4 seconds. The greater the reverberation time, the lower the word discrimination ability of those in the room (hearing and non-hearing students). Obviously this has a huge impact on learning. If reverberation times are too great, acoustic dead spots are created in a room.

Non-straight corridors reduce the sound waves' ability to travel.

Natural light (from windows or natural light bulbs) facilitates lip reading. Fluorescent light doesn't.

Where systems are based on sound (bell, fire alarm etc.) there should be a visual alternative i.e. a flashing light. A cheaper option would be to issue pupils or hearing impaired visitors with vibrating personal pagers. However, these would require hearing impaired visitors to identify themselves, they need more maintenance, and if a person isn't wearing it they may miss the fire alarm.

OHP and Interactive White Boards (SMART boards) mean that a teacher can face the class while writing something down. This facilitates lip reading.

Broadband points for video conferencing. These would allow pupils in different areas to sign to each other and would allow access to an interpreter (who is not on site) for a signing visitor.

Door surrounds and door handles should be in clear contrast to the corridor and door colour for those with Usher Syndrome (and the visually impaired). The same applies in toilets for sanitary ware and wall finishes.

There should be access to a text phone. Some deaf adults use minicoms (phones with keyboards) but increasingly mobile phones are used for texting. A mobile would allow a deaf parent to contact the school. It may be necessary to find out if a deaf parent prefers minicom, texting, or fax.

Ambient noise should be minimised. Background noise should be borne in mind when equipment is purchased.

Technical (requiring to be wired in)

Soundfield Systems

A Soundfield system improves the signal to noise ratio. Speech intelligibility is directly related to signal to noise ratio (s/n), i.e. the difference between the speaker's voice (signal) and the ambient room sound (noise.) The greater the s/n the greater the intelligibility. Normal hearing children require a signal to noise ratio of at least +6dB. By the careful placement of speakers a Soundfield system makes the teacher's voice be of an equal volume throughout the classroom. The teacher wears a microphone which transmits a signal to the speakers. There are 2 main types of Soundfield system:

FM

FM is slightly cheaper. FM transmits the signal from the teacher's microphone to the speakers using an FM frequency. However you do need a different frequency for each room. This is no problem in smaller schools.

Infra-red

Infra-red is fractionally more expensive but the sound is contained in one room—there is no over-spill and no requirement for numerous channels.

Both systems are compatible with FM radio aids.

It is suggested that Soundfield systems are supplied and purchased on a supply only basis. As a guide allow £1000 per room for supply and fit. They are relatively easy to fit although someone who has been trained would be required to say where the speakers should be positioned.

Soundfield System benefit **all** pupils not just those with significant hearing problems. They are now a relatively standard item in schools in the USA. Research details on their effectiveness are available.

If a wireless IT system is being installed it would have to be checked that it is compatible with the Soundfield system selected.

Loop System

In public areas e.g. the hall it is recommended that a loop system be installed for hearing aid wearers.

Again its compatibility with the Soundfield system and a wireless IT system would need checking.

Some form of portable loop would also be beneficial for interviews in smaller rooms.

Consideration should be given to the wiring in of a pager system.

Technical equipment (not hard wired)

DVD players should have built-in caption decoders to allow pupils access to hidden subtitles.

Televisions should have teletext.

- At least one recording device in the school should have the ability to record subtitles.
- Interactive white boards.
- Video conferencing facilities.
- Text phone, texting facilities.
- Portable loop system (beneficial for interviews in smaller rooms.)

Teachers of the deaf

Whether visiting the school or based in the school, Teachers of the Deaf require a room they can withdraw a pupil to. These rooms should be fitted in accordance with the above considerations.

Hearing impaired pupils

These pupils should have access to a quiet room for when things get too much or for a "bad hearing" day—tinnitus etc.

Considerations for Pupils with Visual Impairments

Consider areas in the school environment which need to be made more visible, e.g. edge of steps, outlining a light switch, defining doorways. A painted strip (usually yellow or white) can be used to provide greater contrast in these areas.

Consider lighting conditions in all areas of the school environment (inside and out) in which the student will be operating, e.g. stairs, covered walkways, locker areas, and toilets.

A student may need storage room for equipment.

The learning environment is divided up into four areas:

The visual environment

The sound environment

The tactile environment

The social environment

For pupils with a visual impairment who have some useful vision, the visual impairment is important and can affect the pupil's learning. Areas of the visual environment which need to be considered are décor (walls, floors, ceilings, furniture, displays, and people) and lighting. The amount and quality of lighting can help or hinder mobility and learning. Glare can be a problem when reflected off walls and surfaces. It should be controlled by the use of blinds which work properly and shiny surfaces should be avoided. Good contrast and clarity should be at the forefront of thinking when planning a new build.

The visual environment

Walls and windows

Avoid clutter in the visual environment, e.g. complex visual displays, mirrors, and window paintings etc.

Ensure that furniture is well contrasted against the background.

The borders of different areas of the classroom should be clearly defined using furniture, floor and wall covering, with location clues for multi-disability visually impaired children.

Furniture

Keep a consistent, orderly classroom layout.

There should be sufficient storage space which is clearly labelled and accessible.

Ensure that furniture doesn't have dangerous, sharp edges.

Use surfaces which do not reflect glare.

Ensure that the edges of the tables are well contrasted with the flooring and have good contrast with the materials placed on them, e.g. light coloured surface for dark object and dark coloured surfaces for light materials.

Displays

Should be orderly.

Pupils should know what is on display.

Labelling should be at correct height.

Displays should be simple and visually attractive, rather than visual clutter.

Notices and labelling should be clean, clear, and well contrasted.

Floors and furnishings

Floor coverings should give a clue to the pupils regarding the area they are in, but they can create problems if too patterned, cluttered, or poorly contrasted, e.g. carpets.

Tiles or linoleum can create reflected glare.

Strong sunlight and glare should be controlled by properly working blinds or curtains.

Plain mats can reduce clutter and provide boundaries to different areas.

Lighting

Good lighting doesn't necessarily mean bright lighting. Some children with extreme sensitivity to bright light would find this difficult as they need lower than normal levels of light—a light dimmer would be appropriate to be able to control the amount of light.

Lighting should not be so strong as to cause discomfort, glare, or deep shadows.

Some children have eye conditions which require extra task lighting.

Allow a good mixture of natural and artificial lighting in rooms.

Corridors and staircases should always be well lit for safe movement around the school.

There should be power points around the room to safely connect extra task lighting for some pupils as well as their specialist equipment.

A light meter can be used to assess levels of lighting in rooms and at the pupil's workplace and is usually around 300 lux.

It is essential to ensure that a pupil with a visual impairment is correctly seated in relation to light sources as this can greatly affect their learning. Light should generally be coming from behind the pupil.

The sound environment

Sounds in the environment can be a distraction or helpful—too much noise can be a distraction, frightening or confusing.

Do not have constant music playing as this will mask useful sounds which give the visually impaired pupil clues to what is happening around him or her.

Sound can be affected by the size of the room, furniture or furnishings, position of the visually impaired pupil, other competing sounds, the number of children in the room etc.

The tactile environment

Work areas should be orderly with clearly labelled storage places.

For the youngest visually impaired children, an edged table can be considered.

Floor surfaces can provide foot clues for a visually impaired child, e.g. raised surfaces with different textures.

Hard surfaces such as tiles or vinyl can cause confusing echoes, particularly at busy times.

Hand clues can be added around the school, e.g. at the end of a hand rail, indicating the end of a flight of stairs.

Keep walkways free of hazards, e.g. shelves, projecting fire extinguishers.

All doors should be hinged so they are not left half open.

Windows should not be left half open so that they become a hazard.

The social environment

Avoid the isolation of children with a visual impairment, who have specialist, electronic equipment, by providing plenty of mains power points around the classrooms and considering the design of classrooms to facilitate interaction, social interactions, and inclusion.

Aspects to consider: Classrooms, corridors and halls

Positioning

Where are the children expected to work?

In what position and on what surfaces?

Where does the light source come from?

Lighting

There should be plenty of natural light sources.

At what time of day is sunlight at its strongest in each teaching area?

There should be working blinds or plain curtains available to block out some of the light.

Ensure that glare in these work areas is kept to a minimum.

Consider overhead, artificial lighting which is adjustable, is not too harsh, and does not create shadows.

Classroom management

There should be areas which are clearly defined by a change of floor surface texture or covering.

There should be plenty of storage areas, which are clearly marked.

Flooring and furnishing

Flooring should not reflect glare and should cue a change of area use.

Furniture should be clearly contrasted with floors and walls.

All steps and stairs should be clearly highlighted along their nosings in yellow and well contrasted.

Slopes should have a hand rail at the correct height and well contrasted in yellow or white.

Classrooms should be kept free of clutter and have only the necessary furniture.

Surfaces

Use plain, matt surfaces which do not reflect glare and are well contrasted.

Floor

There should be clearly defined changes in surfaces.

Trays/standing frames

These should not produce glare, should be at correct level, and well contrasted.

Non-slip mats

These should not produce glare and should be well contrasted.

Equipment

Equipment should be kept in the same place and be clearly defined or labelled.

There should be no equipment lying at a low level on the floor, which poses a trip hazard.

Walls
Walls should be kept plain as patterns are confusing.

Doors and floors should create a good contrast.

There should be no cluttered displays.

Surfaces should be matt rather than shiny.

There should be clearly defined areas for storage.

Doors, knobs, light switches should be highlighted and well contrasted.

Cupboards should have clear, bold labelling.

Auditory
Sound produced should be softened rather than amplified.

There should not be constant, distracting sounds in the classroom, e.g. a humming light.

There should be different floor surfaces which give different, auditory clues.

Sounds should be used to indicate different activities.

Corridors and entrance halls
All corridors and halls should be well lit.

Doors should be clearly marked.

Corridors and halls should be kept clear of obstacles, e.g. stored equipment on floors.

There should be guides to indicate where classrooms and other areas are.

Classrooms and halls should have Braille signs outside them at pupils' eye level.

Displays should be at pupils' eye level.

There should be auditory, tactile, and olfactory clues around the school to act as guides.

Aspects to consider: Outside around the school site

Along the nosings of steps, drop-offs (e.g. drains,) and pathways should be clearly defined in yellow paint.

Posts, pillars, and bollards should be clearly contrasted from the ground and background in yellow or white.

There should be tactile or visual clues given to mark the boundary between outside and inside, e.g. metal grids, rubber or bristled mats, and ramps by doorways.

Playground equipment should stand out and be well contrasted from the ground surface and background.

Furniture such as benches or signposts should be clearly contrasted with their immediate surroundings.

Windows and doorframes on the exterior of the building should contrast clearly with the brickwork.

Different areas of the playground should be enhanced using different ground surface textures.

The school ground boundaries should be clearly marked.

Signs and signposts should be clear, bold and at the best height for children to read.

Considerations for Pupils with Autistic Spectrum Disorder or Sensory Difficulties

The adaptations recommended for pupils with Autistic Spectrum Disorders (ASD) or sensory issues are made in order to deal with or reduce sensory “overload” which in turn reduces the stress these pupils are experiencing. This increases their independence and their ability to study in a setting.

Corridors
Muted colours.

Doors
Door opening mechanism.

Height of handles positioning out of reach of pupil or double handles or mechanism that ensures that only staff can open or control opening.

Type of handles.

Glass strip in door for observation.

Playground and pitches
Benches where pupil can sit and relax away from others if required.

Paths/games painted on playground for pupil to walk around—a de-stressing activity.

Signage
Height of signs and clarity of font.

Visual support.

Car and minibus parking
Sufficient number of bays.

Stairs
No full length windows.

Muted colours.

Fire evacuation
Relevant information in the school’s Health and Safety policy.

Personal emergency evacuation plan for each disabled pupil including information on method of egress.

Training for staff.

Regular practice.

Furniture and equipment

Always discuss with Occupational Therapists and Physiotherapists individual seating and equipment needs.

Consideration to set up a life skills area to teach cooking and self-help skills to pupils with ASD in a quiet environment.

Microwave oven.

Equipment to develop individual skills.

Rooms for specific curricular activities

Seek appropriate advice on use of specialist rooms and equipment required.

Soft play

Size of room.

Position in school.

Layout of equipment.

Age of pupil using facility.

Sensory

Size of room.

Position in school.

Layout of equipment.

Age of pupil using facility.

Chill-out room

Minimum soft furnishing.

Fixed furniture.

Muted soft wall colours.

Carpets.

Low lighting—dimming if possible.

Sockets for music player or bubble light to reduce stress.

Door with only small panel of glass with blind.

Any windows with blackout or blinds.

Not in a “busy” part of school, not close to music or technology rooms with electric equipment.

Stress reducing equipment—individual to meet needs.

Time-out room

Layout will be dictated by needs of pupils to use space.

No windows or toughened glass.

Low lighting e.g. muted spots in ceiling with dimming

Door with blind.

Muted colours.

Bean bags or very soft furniture.

Fixed furniture.

Therapy

Consult with NHS staff as to what therapy they wish to use in the room.

Equipment.

Storage for equipment.

Shelving at adult height.

Toilets and changing areas

Always seek advice.

Children and young people with ASD can be very sensitive to smells and noise, and although able to use a standard toilet they may not be able to use a multi-cubicle arrangement due to social skills and sensory issues.

Cistern and toilet

In general, a standard toilet should be chosen; this will enable specialist equipment to be mounted over the toilet, if needed.

Male ASD pupils prefer a separate toilet rather than urinals.

Muted colours.

No strip lights.

No hand dryers.

Shower

Preferably a wet room type of shower.

Plinths and changing beds

Not wall mounted, but free-standing. Staff will need to be able to stand either side of the bed or plinth.

Wash hand basin

Height of sink.

Taps should preferably be of the lever type.

Temperature control.

Storage

Not fixed units, free-standing wheeled washable units.

Lighting

Not strip if pupil has ASD, but this should apply throughout the school.

Laundry area

Layout.

Consider safe movement of staff in the room.

Tumble dryers and washing machines should not be installed in the toilet area for health and safety reasons, but also for noise which can upset pupils with ASD.

Storage.

Not fixed units, free-standing wheeled washable units.

No sluice room is required

Swimming pool/PE

Changing facilities—cubicle for ASD pupil to change away from peers.

Lighting

ASD friendly lighting.

Possibility to mute Tannoy system in certain rooms.

Considerations for Pupils with Physical Impairments and Motor Difficulties

Entrance and exits
Width of the door to accommodate a wheel chair.

Door opening mechanism.

Height of handles.

Door handles should be lever type not knobs that need turning.

Weight of doors.

Mats.

Matting wells on door steps.

Steps/stairs up to doors.

Nosing on steps.

Two sets of double doors with restricted space between for person to be accommodated between doors or to open second set of doors.

Corridors
Floor covering should be non-slip, not slippy when wet.

Width of corridor.

No sloping floors.

Visual contrast on walls.

Handrails.

Doors
Width of the door to accommodate a wheel chair.

Door opening mechanism.

Height of handles.

Door handles should be lever type not knobs that need turning.

Weight of doors.

Hinges.

Playground and pitches
Exits to playground and pitches accessible to wheelchair user.

Playground surface without rough patches or potholes which can cause fall or tip wheelchair.

Paving and paths—consider width, camber and slope.

Drainage channels, drains and covers—are they a tipping or tripping hazard?

Obstacles such as rubbish or recycle bins, salt bins, which impede access.

Variable heights of surface from tarmac to grass.

General trip hazards.

Signage
Height of signs and clarity of font.

Car and minibus parking
Placing of bays.

Width of bays.

Room to operate ramp or electric tailgate.

Space to manoeuvre.

Clear short access to school from disabled parking.

Lifts, platform lifts and stair lifts
Consider the most appropriate type and size to meet the most needs.

Lifts should be wide enough to accommodate a wheel chair and two adults.

Height of operating panels.

Height of call button.

Threshold heights to allow wheelchair to move easily from floor into lift.

Stairs
Floor covering should be non-slip, not slippy when wet.

Width of stairs.

Visual contrast on walls.

Handrails and bannisters.

Visual contrast to stair nosings.

Stair wells with room to manoeuvre.

Room for Evacuation chair to be mounted.

Please note that textured stair edgings and textured areas at the top of stairs, put in place for visually impaired children can impair the downward movement of evacuation chairs. Refer to your maintenance contract for advice on Evac chair tracking.

Ramps
Positioning.

Width.

Surfaces.

Stability.

Permanent or temporary?

Angle and rake.

Fire evacuation
Relevant information in the school's Health and Safety policy.

Personal emergency evacuation plan for each disabled pupil including information on method of egress.

Position of evacuation equipment.

Choice of equipment e.g. Evacuation chair or Ski pad.

Training for staff.

Regular practice.

Tracking hoists

Position.

Placement within appropriate areas of school.

Enabling transfers to and from equipment and not for transporting.

Ensuring all electrical equipment is on council's database and included in servicing and repair contract.

Training for staff.

Furniture and Equipment

Always discuss with Occupational Therapist and Physiotherapists individual seating and equipment needs.

Practical rooms adaptations e.g. Home economics, Science, Technology, Art, PE—access to gym, equipment, and changing rooms.

Switches, sockets, intercoms, door pads at accessible height.

Rise and fall desks for wheelchair users.

Rise and fall sinks.

Rise and fall cooking hobs.

Sloping art desks.

Adapted cooking utensils.

Accessible seating and desks in all subjects.

Dining room furniture.

Rooms for specific curricular activities

Seek appropriate advice on use of specialist rooms and equipment required.

Soft play

Size of room.

Position in school.

Layout of equipment.

Age of pupil using facility.

Ensure wheel chair users can get to all equipment and move across room.

Sensory

Size of room.

Position in school.

Layout of equipment.

Age of pupil using facility.

Ensure wheel chair users can get to all equipment and move across room.

Therapy
Consult with multi-agency staff as to what therapies they wish to use in the room.

Equipment.

Free-standing therapy benches.

Room for hoists and manoeuvring wheelchair.

Time-out
Layout will be dictated by needs of pupils to use space.

Consider if space needs window and/or blinds.

Fixed furniture.

Chill-out low sensory
Furniture.

Colour of walls.

Carpets.

Stress reducing equipment—individual to meet needs.

Life skills development areas
Equipment to develop individual skills.

Discuss with Occupational Therapist or Physiotherapist what equipment is required.

Toilets and changing areas

Always seek advice from children's services staff such as physiotherapists and occupational therapists, or ECS moving and handling trainers.

The toilet design required is an assisted toilet and not a disabled toilet. A toilet plan and PAMIS recommendations for a full bathroom (toilet and shower facility.) are included in the appendix, to give an idea of space required, but note that these are generic, and a free-standing changing table and 'normal' cistern/toilet are preferable in schools.

Size of area recommended for an assisted toilet is 12 square metres.

Layout of the room should allow the wheelchair user to manoeuvre from the toilet to the shower or to be hoisted.

Cistern and toilet
In general, a standard toilet should be chosen as this will enable specialist equipment to be mounted over the toilet. Do not consider installation of a 'disabled toilet' and do not use DOC M packs..

If the toilet is for a nursery-aged child a smaller toilet may be needed.

The toilet should never be fixed in the corner of the room; there should always be room for an adult to stand either side of the toilet to assist with moving and handling, and for a mobile hoist to be brought in.

Other equipment should be mounted at a distance from toilet to ensure access and movement are not impeded.

Shower
This should preferably be a wet room type of shower.

Do not use a flat wall mounted solid shower seat.

If seat has to be fixed it needs to be a plastic seat with holes to allow bodily fluids and water to pass through, and to allow deep cleaning.

There should be no variation in the floor levels, no raised edges enclosing the shower space.

Curtain rails should be fixed to the walls and not ceiling to avoid impeding the movement of tracked hoists.

Hoists
Ceiling track or free-standing hoists may be needed. Again seek advice from children's services staff such as physiotherapists and occupational therapists, or ECS moving and handling trainers.

Plinths and changing beds
Not wall mounted, but free-standing. Staff need to be able to stand either side of the bed or plinth.

Wash hand basin
Height of sink.

Taps should preferably be of the lever type.

Temperature control.

No plinth under sink so as to allow wheelchair to get up to sink.

Storage
Not fixed units, free-standing, wheeled, washable units.

Lighting
Should not impede tracking hoist.

Not strip if pupil has ASD.

Mirrors
Tilting so wheelchair user can see themselves.

Floor covering and tiles
Easy to clean.

Door handles and door locks
Need to be drop lever type not locks or handles that require to be turned or locks that require to be slid back and forth.

Laundry area
Layout.

Consider safe movement of staff in the room.

Tumble dryer/washing machine should not be installed in the toilet area for health and safety reasons, but also for noise which can upset pupils with ASD.

Storage.

Not fixed units, free-standing wheeled washable units.

A ‘sluice’ or ‘sluice room’ is NOT required.

Swimming pool/PE

Changing facilities

Doors.

Width of areas.

Floor surfaces.

Changing beds—not wall mounted.

Toilet assisted

See Appendix—PAMIS recommendations for an assisted toilet.

Access to pool

Doors.

Width of areas.

Floor surfaces.

Manoeuvrability.

Temperature control of water and changing area

Pupils with physical difficulties need warmer temperatures.

Hoists

Need to be specialist for pool use, for example Oxford dipper/Sutton cradle.

Information can be found in JP Leonard Catalogue.

Appendix

Further reading on adaptations for visually impaired people

Barker, Peter; Barrick, Jon and Wilson, Rod, (1995), *Building sight: a handbook of building and interior design solutions to include the needs of visually impaired people,* London: HMSO in association with Royal National Institute for the Blind.

This book sets out to explore the particular problems facing visually impaired people in the built environment and provide solutions. It includes information on the effects of the ageing process on the eye.

PAMIS recommendations for an assisted toilet

pamis
In partnership with people with profound learning disabilities and their carers

Changing Places Toilet
The lack of suitable changing facilities in toilets for people with disabilities is one of the most restrictive practical problems preventing families from going out.

Families are reduced to changing their daughters or sons on toilet floors. This is undignified, unhygienic and involves heavy lifting by the carers with the potential to cause serious damage to their backs.

This results in families opting to stay at home which increases isolation and lack of stimulus.

Changing Places is a national campaign with the aim of ensuring that 'standard accessible toilets' (disabled toilets) are made fully accessible. The campaign was initially started by *PAMIS* who have now joined forces with other groups to form the *Changing Places Consortium*. Over 170 organisations and agencies across the UK are supporting the Consortium's 'Changing Places' campaign. The Consortium is also working with MPs/MSPs/Assembly members, service providers and the British Toilet Association to bring about change. Last year we were successful in getting the standards for *Changing Places* facilities incorporated into the British Standards BS8300:2009. Architects use these standards when they are designing new public buildings.

Requirements of a *Changing Places* Toilet

An adult sized, hydraulically operated (not electric) height adjustable changing bench which is either wall mounted or free-standing

In schools, we would advise free-standing wherever possible

A ceiling tracking or a mobile hoist.

A peninsular (centrally placed), standard height (not disabled height as in BS8300) toilet.

A privacy screen or curtain (may not be necessary in schools)

A large bin for pads.

An emergency alarm.

A non-slip floor.

Adequate space for a disabled person when they are not in their wheelchair, their wheelchair and one or two carers. The standard minimum size was 7m2 when we launched the campaign in 2006, it has now been revised to 12m2 (3m x 4m), BS8300:2009.

And link back to considerations for pupils with hearing impairments.