RESPONDENT INFORMATION FORM
Non Domestic Sustainability Labelling within Building Standards for Schools

Please Note this form **must** be returned with your response to ensure that we handle your response appropriately

Please complete either individual or organisation only

Individual

1. Name

2. Postal Address

Postcode

Phone

Email

3. Permissions – I am responding as a Individual

(a) Do you agree to your response being made available to the public (in Scottish Government library and/or on the Scottish Government web site)?

Please tick as appropriate √ **Yes** ☐ **No**

(b) Where confidentiality is not requested, we will make your responses available to the public on the following basis

Please tick ONE of the following boxes

Yes, make my response, name and address all available ☐

or

Yes, make my response available, but not my name and address √

or

Yes, make my response and name available, but not my address ☐

(c) We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

Please tick as appropriate √ **Yes** ☐ **No**

Group / Organisation

1. Group / Organisation Name

The Association of Noise Consultants

2. Group/Org Type (please tick one)

Local Authority	☐	Commercial Organisation	☐
Professional Body	☐	Voluntary Organisation	☐
Contractor/Developer	☐	Housing Provider / RSL	☐
Designer/Consultant	☐	NDPB/Agency	☐
Academic Body	☐	Advisory Body/Committee	☐
Industry Association/ Manufacturer	√	Other (Please Specify	☐

3. Contact Name

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5. Permissions – I am responding as a Group / Organisation

(a) The name and address of your organisation ***will be*** made available to the public (in the Scottish Government library and/or on the Scottish Government web site).

Are you content for your ***response*** to be made available?

Please tick as appropriate √ **Yes** ☐ **No**

(b) We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

Please tick as appropriate √ **Yes** ☐ **No**

CONSULTATION QUESTIONS

Background

Buildings that are designed to be sustainable have positive impacts on the potential for sustaining human wellbeing, minimising carbon dioxide emissions and reducing the use of finite resources. For a building to earn a sustainability label, it must demonstrate that a wide range of factors are considered in its design, and that these factors are achieved in its construction.

On 1st of May 2011 Sustainability labelling was introduced to the Scottish Building Standards through the Building (Scotland) Act 2003. It allows Ministers to make building regulations for the purpose of furthering the achievement of sustainable development. Applicable to all new buildings, the principles build upon the degree of sustainability already embedded within the building regulations.

The labelling system in Section 7 of the Technical Handbooks rewards new buildings that meet the 2010 building standards with a Bronze level label. Further optional upper levels are defined by Silver, Gold and Platinum. These have been created through identifying cost-effective benchmarks verifiable through the building warrant system.

Sustainability was fully developed for domestic buildings, and addresses a variety of aspects aimed at providing delivering sustainable buildings. The introduction of sustainability labelling has been generally welcomed by both industry and Local Authorities, as it clearly defines national sustainability by providing straightforward benchmarks which both designers and organisations can aspire.

Section 7 intends to make sustainable design within the reach of all new buildings and not just belong to a niche market. Sustainability labelling aims to encourage consistency between planning authorities that use supplementary guidance to promote higher measures of sustainable construction in their areas. By making reference to this standard, local aspirations can be met by the selection of clear national benchmarks.

Due to their more varied and complex nature, labelling for non-domestic buildings was only partially developed. It is the purpose of this consultation to develop these further using schools as a pathfinder in the first instance.

The development of the non domestic labelling system takes into account what is necessary to meet the requirements of other systems that demonstrate a building's sustainability.

Consultees are encouraged to respond on any aspect of the proposals but Scottish Ministers would welcome comments specifically on the issues that have been targeted. It is recognised that a ‘yes’ or ‘no’ is not always a satisfactory answer to the question. Consultees are therefore encouraged to add reasons for their answer to expand their opinions, particularly when they disagree with the approach proposed.

1. Scope and balance

It is intended that sustainability labelling for new schools should build on the existing system and continue to define measures that can be easily verified using both calculations already needed or plan checking of specifications.

Building Standards Division of the Scottish Government (SG) has explored through a working party the aspects of design and construction of school buildings relating to sustainable development appropriate for the optional higher levels of sustainability. The aspects define aims relevant to the building warrant stage of a development when applicants are looking at the detail of buildings. They address issues that can be verified within the building standards system and so tend to be directed towards technical environmental performance issues. The eight aspects proposed for schools are:

- CO_2 emissions
- Energy for thermal comfort and artificial lighting
- Water Efficiency
- Biodiversity
- Wellbeing
- Flexibility and adaptability
- Material Use and Waste
- Optimising Performance

1. Are consultees content that the defined aspects for school buildings reflect a balance of sustainability issues that can be delivered by the building standards system? Yes ☐ No ☒

Where appropriate, please provide comment in support of your answer:
We have concerns regarding the content of Section 6c Acoustics. We have not commented on other areas as this is outside the scope of our expertise

2 Revisions to Regulation 7.1

It is proposed that the principles behind the existing mandatory building standard 7.1 will remain which requires a label showing the level of sustainability to be fixed to the building. It will however have the text highlighted in yellow for 7.1(b) amended to take account of schools.

Standard 7.1

Mandatory
Every building must be designed and constructed in such a way that—
(a) with regard to a dwelling, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions, resource use, building flexibility, adaptability, and occupant well-being is achieved;
(b) with regard to a school building containing classrooms, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions, resource use, building flexibility, adaptability, biodiversity and occupant well-being is achieved;
***(c)* with regard to non-domestic buildings *other than school buildings containing classrooms*, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions is achieved; and**
***(d)* a statement of the level of sustainability achieved is affixed to the dwelling or non-domestic building.**

Limitation:
This standard does not apply to—
(a) alterations and extensions to buildings, other than alterations and extensions to stand-alone buildings having an area less than 50 square metres that would increase the area to 50 square metres or more, or alterations to buildings involving the fit-out of the building shell which is the subject of a continuing requirement;
(b) conversions of buildings;
(c) buildings that are ancillary to a dwelling that are stand-alone having an area less than 50 square metres;
(d) buildings which will not be heated or cooled other than by heating provided solely for the purpose of frost protection;
(e) buildings intended to have a life not exceeding the period specified in regulation 6; or
(f) conservatories.

2. Do consultees agree with the proposed revisions to standard 7.1? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:
N/A

3. Aspect of Energy efficiency for thermal comfort and artificial lighting

This aspect should act as an incentive to encourage long-term energy efficiency via the automatic control of heating, cooling, ventilation and artificial lighting. Simply addressing fabric energy efficiency through improved U Values and air tightness beyond that of the existing energy standards has a reduced lifecycle cost benefit impact than when applying the same principle to domestic buildings.

It is anticipated that the design of a more sustainable building will encourage the inclusion of passive measures such as exploiting solar gain, encouraging natural ventilation and good levels of natural lighting. However there will inevitably be the need to ensure that where energy is required for the purpose of heating, cooling, ventilation and artificial lighting of the building that the controls should automatically optimise these functions.

For further details on proposals please refer to the accompanying draft guidance document.

3. Do consultees agree with the proposed approach for energy efficiency by addressing controls to optimise thermal comfort and artificial lighting? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:
N/A

4. Water Efficiency

4a. Water use efficiency

For the most part, Scotland does not suffer from water shortages. Scottish Water is the largest user of electricity in Scotland with a large proportion of energy used for the production of potable water and treating waste water. The reason for addressing water efficiency is to reduce the energy used throughout the water cycle. Users will generally not be aware of the energy used in providing water to a building and its subsequent removal, treatment and disposal. The aim of this aspect is to minimise the consumption of potable water through the installation of low flow fixtures and fittings including:

a. WC cisterns
b. Urinals
c. Wash Hand Basin Taps
d. Showers
e. Water butts
f. Rainwater harvesting or greywater recycling system

Note: Kitchens, laboratory, or service room sinks are not included in low flow fitting targets.

A fittings based approach is proposed as the most effective and practical method for addressing water use efficiency. This has the advantage of allowing a simple check on specified and installed products that are being widely commercially available.

For further details on proposals please refer to the accompanying draft guidance document.

4a. Do consultees consider the water efficiency measures offer a practical approach to encouraging a more efficient use of water resources? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

4b. Energy for water heating

Water heating accounts for around 8% of overall energy use in schools. Reducing water use through efficient fixtures and fittings and the energy used for heating water will reduce the energy consumption in a building and subsequently the CO_2 emissions leading to direct financial savings. Energy required for the heating of swimming pools will not be included as a requirement in sustainability for schools.

Real-time consumer feedback helps to raise awareness of water use and the associated energy used and alert occupants where there may be potential problems. Therefore a real-time resource use display device to include hot water consumption

is proposed together with requiring a percentage of the annual energy demand for water heating should be from heat recovery or renewable energy sources.

For further details on proposals please refer to the accompanying draft guidance document.

4b. Do consultees agree with the proposed approach for energy for water heating and resource use monitor? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

4c. Surface water management

The most appropriate manner to address surface water is by incorporating a Sustainable Urban Drainage System (SUDS). SUDS are appropriate in both urban and rural situations and are needed to protect water quality and reduce potential for flood risk.

Often used to minimise the potential for silt, chemicals or oil pollution to natural watercourses from surface water run-off from buildings and hard surfaces. SUDS can also provide attenuation of surface water to reduce the impact of flow on watercourses. A well designed system can include features such as green roofs, living walls and attenuation ponds which can make a positive contribution to the amenity and wildlife value of a site. Attenuation ponds can require up to 5-7% of a site area, although this may be reduced where other SUD solutions are employed.

Green roofs and living walls not only offer solutions for dealing with surface water but support the natural biodiversity of a site. Further benefits include additional improved thermal insulation and cooling in the summer months thereby reducing whole life costs, reduced flooding risks, increased opportunity for contact with nature and creating a healthy environment through improved air quality and noise reduction. They can also be used as an educational tool enabling opportunities for contact with nature particularly within urban environments. Further details on green roofs can be found on the Scottish Green Roof forum available at http://www.sgrf.org/

Scottish Planning Policy seeks to address the issue of surface water disposal through the Water Environment (Controlled Activities) (Scotland) Regulations 2005 which calls for all surface water from new development to be treated by SUDS before being discharged into the water environment (the exception being single houses or where the discharge will be into coastal water).

Section 3.6 of the Building Standards Technical Handbooks already provides guidance to address surface water drainage and encourage the use of SUDS. The aim of introducing it to sustainability labelling is to encourage systems that address both surface water issues and makes a positive contribution to the amenity and wildlife value of a site and the people who may use it.

For further details on proposals please refer to the accompanying draft guidance document.

4c. Do consultees agree with the proposed approach for surface water management? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:
N/A

5. Biodiversity

Biodiversity does not feature in building regulations and therefore the introduction of a biodiversity aspect would be new to Building Standards. The reasons for including biodiversity in the proposed sustainability system are:

- to minimise the impact of building development on existing site.
- to enhance and encourage the biodiversity of the natural habitat on developments
- to increase the opportunity for pupils to have contact with nature and promote ecology.

Biodiversity is the range of organisms present in a particular ecological community or system. It can be measured by the numbers and types of different species or the genetic variations within and between species. Ecology is the study of the relationships between living organisms and their interactions with their natural environment.

Planning Advice Note 65 provides information on Planning and opens spaces which encourage biodiversity and ecology through green networks and infrastructure. SG Planning's Green Infrastructure guidance encourages the use of items such as green roofs, living walls, and allotments growing spaces, orchards, and managed water courses.

It is proposed that areas of land within the curtilage of schools could be set aside to improve biodiversity through the development of native woodland areas, natural habitats and dedicated areas for the growing of fruit and vegetables. A biodiversity document will assist pupils and teachers to promote ecology through the natural lifecycles of growing fresh produce or the protection of natural habitats and recognise and how this contributes to a sustainable future. Such provisions not only improve biodiversity through practical participation but improve the well being of individuals.

For further details on proposals please refer to the accompanying draft guidance document.

Yes ☐ No ☐

5. Do consultees agree with the proposed approach and criteria for including biodiversity?

Where appropriate, please provide comment in support of your answer: **N/A**

6. Wellbeing

For buildings to possess a degree of all-round sustainability, a balance of social, economic and environmental factors must be displayed. By definition, sustainability is long-term. So to maintain relevance in Scotland that increasingly aspires to sustainable development, this aspect looks to address the social well-being of building users at a personal level, as well as technical issues.

Wellbeing tackles issues such as occupants' comfort and welfare with aspirational qualities that designers can aim for that are more holistic and long-term. There are some areas directly relating to a building user's wellbeing already covered in building standards (i.e. ventilation, thermal comfort, transmission of noise). For the purpose of upper levels of wellbeing, the following topics are proposed enhanced natural daylight**,** indoor air quality monitors, room volume and acoustics.

6a. Enhanced natural daylight

This is beneficial to a sense of overall well-being and recognised as improving the academic performance of pupils as well as improving the aesthetics of internal spaces. Schools are primarily occupied during daylight hours. Building Bulletin 90 (BB90) 'lighting for school design' recommends that 'sustainable school design should assume that daylight will be the prime means of lighting when it is available'. Natural daylight also reduces the need for artificial lighting. The incorporation of daylight linked controls for artificial lighting can further reduce overall energy costs. Adopting this approach ensures that consideration for daylighting has been appropriately addressed from the outset of the design.

Daylight can be measured by a daylight factor which is expressed as a percentage that will rise or fall depending on the relationship of glazed area and room dimensions. This is simplified as an average for a particular room. An average daylight factor (DF) calculation is proposed for certain occupied areas in schools. Guidance on how to achieve this is found in the CIBSE Lighting Guide 10: 'Daylighting and window design' and suggests:

- A daylight factor of 5% or more will create an acceptable environment when day lit only.
- A daylight factor of 3% will require artificial lighting for uniformity.
- A daylight factor of 2% or less will require use of artificial lighting most of the time.

For further details on proposals please refer to the accompanying draft guidance document.

6a. Do consultees agree with the proposed approach of addressing natural daylighting for sustainable schools? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

6b. Indoor Air Quality

Good indoor air quality (IAQ) is also highlighted as an important issue for sustainable school design. Ventilation to maintain IAQ contributes to the health, comfort and wellbeing of the occupants. Without adequate ventilation it is likely that indoor pollutants will rise to unacceptable levels. These pollutants can include volatile organic chemicals (VOCs), gases such as nitrogen dioxide, ozone and carbon monoxide, particulate matter and fibres, and biological particles such as bacteria, fungi and pollen. Considered ventilation can also be used for natural cooling, prevent summer overheating. However it should be noted that in most cases IAQ can only be as good as the external air quality.

Ventilation for good indoor air quality is required under Building Standard 3.14. This recognises that good ventilation is important to remove unnecessary CO_2, organic impurities, unwanted fumes, dust and odours. Another benefit of good ventilation is that it assists in maintaining an acceptable level of relative humidity within buildings. Failure to maintain acceptably low levels of relative humidity can lead to condensation, mould and mildew growth, which can become a source of health related problems, e.g. asthma and allergies.

'BB 101 Ventilation of School Buildings' recommends: "Ventilation should be provided to limit the concentration of carbon dioxide in all teaching and learning spaces. When measured at seated head height, during the continuous period between the start and finish of teaching on any day, the average concentration of carbon dioxide should not exceed 1500 parts per million (ppm).

Occupancy levels of a classroom will vary throughout the day. Whilst the capacity of a mechanical ventilation system should be able to maintain an acceptable IAQ, the provision of a measuring and monitoring device for all teaching accommodation will ensure that optimum quality is obtained whilst maximising the efficiency of a mechanical system.

For further details on proposals please refer to the accompanying draft guidance document.

6b. Do consultees support the provision of an air quality monitor for teaching accommodation? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

6c. Acoustics

The purpose of introducing noise to sustainability labelling is so that the acoustic levels and sound insulation of a building are conducive. Favourable classroom acoustics benefit pupils and teachers alike improving pupil's wellbeing and academic performance as well as improve a school's usability for alternative functions.

Background noise can be a significant obstacle to effective listening. Noise not only masks speech making it difficult to hear what is being said but can also leave pupils tired from the effort required to listen. Therefore it is essential that attention be given to creating teaching spaces with effective acoustics. Effective sound insulation is necessary to establish low background noise levels and ensure that an appropriate acoustic level can be achieved This is essential so that sound does not build up when children are working in groups or more than one person is talking at any one time.

There are currently no minimum standards for acoustic performance or noise reduction for schools, within current building regulations. There is however SG acoustics guidance for schools in "School Design: Optimising the Internal Environment, Building our Future: Scotland's School Estate".

Further guidance is available Building Bulletin 93 (Acoustic Design of Schools) (BB93). Its objective is to ensure that the design and construction of the school provides acoustic conditions (suitable indoor ambient noise levels) which facilitates clear communication of speech between teachers and students, and does not interfere with study activities.

Acoustic design of schools is a complex matter and it is proposed that for upper levels of sustainability, a written design specification is provided by a specialist acoustic consultant to ensure appropriate acoustic performance levels are set for all teaching spaces addressing:

i indoor ambient noise levels including noise from building services
ii airborne sound insulation between teaching spaces
iii airborne sound insulation between circulation spaces and teaching spaces
iv impact sound insulation for floors
v reverberation in teaching spaces
vi sound absorption in corridors, entrance halls and stairwells
vii design of open plan teaching spaces

For further details on proposals please refer to the accompanying draft guidance document.

6c. Do consultees support the approach of addressing acoustics for schools? Yes ☒ No ☐

Where appropriate, please provide comment in support of your answer:

Background

The ANC is the trade association for acoustic, noise and vibration consultancy practices in the UK representing 117 member companies, who employ nearly eight hundred consultants. Established in 1973, the ANC seeks to raise the standards of acoustic consultancy and improve recognition of the

vital role which good acoustics, and the management and mitigation of noise and vibration play in achieving good design and effective planning in the built and natural environment. Membership of the ANC is open to all acoustics consultancy practices able to demonstrate the necessary professional and technical competence.

We have limited our comments to the acoustic performance aspects of the proposed standards.

General Comments

Research undertaken over the past 30 years has shown solid links between the effects of exposure to noise on children's learning and performance at school resulting in deficits in sustained attention, visual attention, poorer auditory discrimination, speech perception, poorer memory for task that require high processing demands of semantic material, poorer reading ability and poorer performance of schools on national standards *[1]*. There is little doubt that a lack of good acoustic design has a detrimental effect upon learning and attainment in primary school children *[2,3]* with the potential for detrimental effects upon reading *abilities [4, 5]*

In light of this evidence acoustics should be considered as one of the most critical features at the Bronze, Silver and Gold standard level when considering students, both in terms of their immediate and future wellbeing.

We would consider poor school acoustic design to be detrimental to the sustainability of any school building.

- Unsustainable in the terms of providing an adequate teaching environment for the child, as previously stated.
- Un-sustainable in terms of providing cost effective teaching facilities, particularly for children with hearing impairments. We would note that the cost of appropriate acoustic treatments to a classroom would accumulate to £2500 over the lifetime of the building while the cost of specialist school education required for a hearing impaired child can accumulate to as much as £90000 per year [6]
- Un-sustainable in terms of providing a healthy working environment for teachers with as much as 80% of teachers having experienced voice problems [7]

There does not appear to be any mention of BREEAM. This is an established assessment method for schools throughout the UK and is often linked with funding for schools. Does this new assessment method seek to replace BREEAM as an assessment tool?

The ANC have been working closely with the Education Funding Agency in England for the re-write of Building Bulletin 93 (BB93). There is now a revised Section 1 of BB93 that forms a contract document for the Priority Schools Building Programme and is shortly to be sent out for industry consultation to be formally adopted as a replacement for BB93 and a means of compliance with English & Wales Building Regulations. For ease of reference in our response, this new document will be referred to as 'PSBP BB93'. This document can be freely downloaded from the following link:

http://www.education.gov.uk/schools/adminandfinance/schoolscapital/buildingsanddesign/baseline/b00213595/baseline-designs---how-the-designs-address-the-brief/acoustics

The ANC wrote a Good Practice Guide for testing in schools, which is used and cited by

BREEAM. This document can be freely downloaded from the following link:

http://www.association-of-noise-consultants.co.uk/ViewFile/Id/326ba9907fb7eea6c5ee3ae7f2ed6d64a7434504

Comment on Bronze Standard – Acoustics

There is no guidance contained within Section 5 of the Handbook, which relates to acoustics within schools. A baseline performance level should be set within the Section 7 document. A prudent starting point would be to require that criteria given in PSBP BB93 be achieved.

Comment on Aspect Silver level 5 – Wellbeing (c) Acoustics

A written specification is asked for from a specialist acoustic consultant covering a range of topic areas. The services of said consultant should be retained throughout the design and construction stages in order to see that due care and attention is paid to acoustic performance and compliance.

No suggestion is given regarding what is considered acceptable as a performance specification. If reference to the guidance in PSBP BB93 is not to be included under the Bronze standard then it should without doubt be included in this section.

If PSBP BB93 is included as Bronze we would recommend that Silver should target PSBP BB93 plus an enhanced level of compliance testing such as 50% of teaching spaces. Our experience has demonstrated that compliance testing is critical to ensuring good levels of workmanship across a development.

It is also noted that the specialist acoustic consultant should be suitably qualified to deal with school design and cites the ANC, IOA and UKAS accreditation schemes. These schemes are purely for the accreditation of competence of testing. They are not an accreditation of the suitability of an individual to undertake school design. This should be changed so that it refers specifically to completion testing only one of the schemes.

The suitability for school acoustic design services should be proven through individuals being Corporate Members of the Institute of Acoustics with a proven track record in the acoustic design of school buildings.

Comments on Aspect Gold Level 5 Wellbeing – (c) Acoustics

Here an acoustic specification in line with BB93 (2012 edition) is called for in all teaching and ancillary areas.

We would consider BB93 to be the base line level at which schools should be constructed; this does not provide a "Gold" standard in terms of achievement. This approach may result in new schools being built at either a lower standard or no better standard than the schools constructed over the last 15 years.

We would recommend that a Gold standard would be the construction of a School to a suitably enhanced performance level beyond the guidance given in PSBP BB93. This could be proved through the stipulation of higher performance levels and an increased completion testing schedule.

A suggested uplift in performance would be 5 dB in order to demonstrate a significant improvement in the environment; this would apply to sound insulation between adjacent spaces. Similarly, in teaching and learning spaces the reverberation time could be reduced to 0.4 seconds, as this has been found to have a significant improvement in the learning environment[6].

The same issue regarding the definition of competence is made in the Gold Level as in the Silver Level. Our comment is reproduced below

It is also noted that the specialist acoustic consultant should be suitably qualified to deal with school design and cites the ANC, IOA and UKAS accreditation schemes. These schemes are purely for the accreditation of competence of testing. They are not an accreditation of the suitability of an individual to undertake school design. This should be changed so that it refers specifically to completion testing only one of the schemes.

The suitability for school acoustic design services should be proven through individuals being Corporate Members of the Institute of Acoustics with a proven track record in the acoustic design of school buildings.

Conclusions

We would make the Scottish Government aware of the distinct possibility that educational attainment rates could be adversely affected if a fuller consideration of Acoustics in the design of all new schools is not adopted. This would be a disservice to the educational staff within the schools and future generations of pupils and parents.

As the Scottish Government's own proposed document adopted the Brundtland Commissions definition of Sustainable development as being one which meets "the needs of the present without compromising the ability of future generations to meet their own needs" it critical that acoustics is considered more fully in light of this evidence.

References

[1] The effects of noise on children at school: Shield BM and Dockrell J E Review Journal of Building Acoustics 10(2) 97-106, 2003

[2] Community Noise. Archives of Center for Sensory Research, Berglund, B and Lindvall T 1995 1-195

[3] The non-auditory effects of noise Report R10 http://www.le.ac.uk/ieh/pdf/ExsumR10.pdf Institute of Environment and Health 1997

[4] Problems of Noise in School Settings: a review of literature and the results of an exploratory study, Hetu R, Truchon-Gagnon C, Bilodeau, SA Journal of Speech Language Pathology and Audiology, 1990

[5] Revisiting speech interference in classrooms Picard M Bradley JS Audiology 40 221-224, 2001

[6] The benefits of a Sound Education –Ecophon Saint-Gobain, 2012

[7] Relationship between subjective voice complaints and acoustic parameters in female teachers' voices Journal of Voice, 13 484-495 Rantala L & Vilkman E 1999.

6d. Room volume

Greater room volume through raised ceiling heights offers a greater potential to optimise good quality natural light, and effective natural ventilation strategy. It can also, through good design, improve classroom aesthetics. Increased ceiling heights potentially allow a greater degree of flexibility and adaptability for the layout of activities and in locating of building services. To encourage the potential for classrooms to be naturally light and ventilated it is proposed to introduce a minimum floor to ceiling height.

For further details on proposals please refer to the accompanying draft guidance document.

6d. Do consultees agree with the proposals outlined for addressing room volume? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:

N/A

7. Flexibility and adaptability

This proposal aims to continue the approach currently taken within building standards, to mainstream utility and general amenity rather than it being the preserve of issues driven by minority interests alone.

Section 3 of the Building Standards Technical Handbooks identifies that all new buildings should be designed to address safety and the welfare and convenience of building users. An inclusive environment is one within which everyone, regardless of age, disability or circumstance, can make use of facilities safely, conveniently and without assistance to the best of their ability.

The first topic for flexibility and adaptability includes facilities within a school that encourage active travel. Active travel is recognised as physical activities such as walking/running, cycling or use of a push scooter or balance bike to travel to and from school. When promoting active travel amenities, including showers and changing facilities, areas to dry clothes and storage lockers are often forgotten when considering users' needs.

7a. Cycle storage

In 2009, the Scottish Government produced a Cycling Action Plan for Scotland which sought to ensure that 10% of all trips would be undertaken by bicycle. There are provisions that can be put in place in and around school buildings to facilitate and encourage cycling to school. Cycling as a mode of transport is valued and there is a desire across local authorities to promote cycling. More recently children have increasingly used non motorised scooters and balance bikes to travel to and from school although the proposals focus primarily on cycling storage.

Considered bicycle parking with sufficient capacity can reduce bicycle clutter that can occur through bikes chained to railings, drainpipes and lighting columns all of which can have an impact on the accessibility and safety of a building.

As well as serving a functional purpose, the provision of a carefully planned, conveniently located, secure parking facilities helps promote cycle use and potentially reduce traffic congestion around schools.

For further details on proposals please refer to the accompanying draft guidance document.

7a. Do consultees agree with the proposals for cycle storage? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

7b. Pupil and staff active travel facilities

Additional facilities to encourage active travel are proposed for all schools regardless of cycle parking provision. Knowing that there is a secure place to store helmets and change of clothes as well as facilities to aid the drying of clothing can positively affect an individual's decision to travel to work using alternative transport.

Such facilities will not only be useful for cyclists but also for those people who walk or run to the school (even part of the way) or partake in physical or outdoor activities before, during and after school opening hours.

For further details on proposals please refer to the accompanying draft guidance document.

7b. Do consultees agree with the proposals to support active travel? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

7c. Vehicle parking and drop off areas

Accommodating active travel and, in particular, commuting by cycle may not be suitable for all schools (e.g. rural schools where the distances to schools require vehicular transport or the routes to a school are not suitable for walking or cycling).

Bus and car drop off areas should be provided within the curtilage of the school although they are used for a very short period of time at the beginning and end of the day and could be utilised by a school for other activities. These areas of hard standings should also be constructed of permeable paving and form part of a SUD system.

Where parking facilities, setting down points and turning circles are provided these spaces should be designed to be a level surface that can allow vehicle drop off and parking areas to be utilised for alternative uses.

For further details on proposals please refer to the accompanying draft guidance document.

7c1. Do consultees agree that a vehicle parking and vehicle drop off areas should be level surface for schools? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:

N/A

7c2. Do consultees fell there should be some form of physical control to the vehicle parking and drop off area? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:

N/A

7d. External teaching space

The benefits of dedicated outdoor teaching spaces to teachers, students and the wider community alike is becoming increasingly important as part of the education curriculum.

It is proposed that all schools should have an external structure(s) providing protection from inclement weather for the purpose of facilitating general teaching activities external performances or outdoor play in all weather.

For further details of proposals please refer to the accompanying draft guidance document.

7d. Do consultees agree with the external teaching space proposals? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:

N/A

7.e Accessibility

Access and circulation within buildings is covered in section 4.2 of the building regulations which asks that, every building is designed and constructed in such a way that safe and unassisted and convenient means of access is provided throughout the building. Proposals seek the primary door to the building should have an automatic powered device.

7e. Do consultees support the accessibility proposals? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:

N/A

7f. Changing Places toilet

A Changing Places (CP) toilet is the name used to describe sanitary accommodation that has sufficient space and equipment to enable people with profound and multiple disabilities to use the facilities safely and conveniently. These facilities have more space and equipment than 'standard' accessible toilets currently required by building standards.

British Standard 8300 (Design of buildings and their approaches to meet the needs of disabled people) advises that CP toilets should be provided in any larger building where the public have access in numbers or where visitors might be expected to spend longer periods of time. For example buildings such as sport and leisure facilities, shopping centres and key community buildings within city/town centre.

For further details on proposals please refer to the accompanying draft guidance document.

7f. Do consultees support the inclusion of a Changing Places toilet provision at the gold level? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:

NA/

8. Material Use and Waste

The collection and sorting of solid waste for recycling is an activity that building users can make everyday contributions towards. It helps balance the technical design focus of many of the other aspects because it is part of an adaptive solution to a sustainable future.

In developing the non domestic system, the use of materials and traditional construction techniques is perceived as having a significant role in contributing to overall sustainability. Materials are viewed positively if they are, locally sourced, recycled, or possess low-embodied energy.

However regulation to address environmental, sustainable or ethical sourcing of materials is too complex at present to be verified at building warrant for some of the following reasons:

- Under the European Construction Products Regulations Directive, regulations cannot impose a barrier to trade according to Article 6. It is possible that a regulation Policy would lead to infraction.
- Any legal limitations under the Building (Scotland) Act 2003, it is improbable that Building regulations would favour a specific building material, in terms of its classification (e.g. timber steel concrete)
- The verification of specified materials traced back to a source or production process via a Chain of Custody (CoC) can be very complex, understanding the sustainable credentials of a huge variety of building materials is often unclear and defined by constantly shifting parameters.
- Accurately assessing, at warrant stage, the quantity of material intended to be used. Quantity would need to be measured in value, volume or mass. Evaluating the ecological value of material– Natural materials such as timber and stone and – processed material such as polycarbonates or other heavily manufactured materials.

It is not proposed to be included at this time, but it is envisaged that the platinum level offers the ability to increase the scope for this topic.

8a. Provision for solid waste recycling during use

In 2008, Europe introduced the Waste Framework Directive which identified the prevention of waste as the highest priority, followed by reuse, recycling, recovery of other value (e.g. energy) and finally disposal as the least desirable option.

According to the definition in the directive, any substance or object the holder discards, intends to discard or is required to discard" is Waste under the Waste Framework Directive (European Directive 2006/12/EC).

In 2010, the SG introduced a Zero Waste Action Plan which set out a vision, where all types of waste are dealt with, regardless of where they came from. The SG has set a target of 70% recycling and composting of all waste by 2025. The Zero Waste Plan emphasises the importance of separating different materials in the waste stream to simplify the process of recovering their value.

All 32 Local Authorities have Waste Management plans in force to ensure that recyclable materials are segregated for recycling. There is no provision for 'storage for the recycling of solid waste' as part of existing Building Regulations for non domestic buildings.

Beyond the materials typically identified for recycling, food waste can also be collected separately and treated using a biological process, such as a sustainable fertiliser for farms, anaerobic digestion or bio-gas facility, to produce energy used to heat and power buildings. The space allocated for food waste should also be:

- Convenient to where food waste is most likely to occur (e.g. kitchens/dining spaces/common rooms).
- Accessible and maintainable.

Provisions are for dedicated areas for recycling and composting located at convenient places within school grounds, A strategy document will identify these areas. This can facilitate temporary storage before transfer to a main storage point or a collection point easily managed by schools and reflects the approach taken by Local Authorities in meeting their Waste Management Plan obligations. This further aligns with national initiatives such as Eco schools which have a strong focus on reducing waster, re- using existing materials and recycling within schools. Provisions will include dedicated areas for waste collection that will be transported for off site.

For further details on proposals please refer to the accompanying draft guidance document

8a. Do consultees agree with the proposals outlined for solid waste recycling? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **NA/**

8b.Gold level material and waste

Currently there are no firm proposals for material use and waste at the Gold level. Three options looking at materials of the built form were discussed:

(1) a site waste management plan (SWMP),
(2) materials maintenance document
(3) designing for deconstruction.

Building Standards would welcome the views of consultees for inclusion of one or more of the measures to be included as part of the material and use waste aspect.

(1) A site waste management plan: This would tackle the problem of construction waste. SWMPs are a mandatory legal requirement in England and all construction and demolition projects worth more than £300,000 must have a SWMP before construction commences. In Scotland there is no legal requirement as yet and it is envisaged that Scotland's Zero Waste Plan will encourage SWMP by voluntary basis. The intention of a SWMP is to find out where all construction waste is going and

hence reduce illegal fly tipping while providing cost savings through reduced requirements for materials, disposal costs and the sale of materials. Moreover, SWMPs can reduce the impact on the local community and the surrounding environment from construction and demolition waste, and hence build good public relationships through corporate social responsibility.

The best opportunity to reduce construction waste occurs at the early design stage, before construction on site starts. To maximise its effectiveness waste management should be on the agenda from an early stage and incorporated in designs by architects and engineers.

Information needed for effective SWMPs include:

- Detailed project information
- Material quantity schedules
- Types of waste and quantities and initial costs pre-design
- Construction schedules to understand when waste will be generated - to target key areas of project (large quantities of wood/steel produced etc)

Concerns were raised in the working group relating to the introduction of SWMPs, highlighting that, in general, waste management data and record keeping is poor and often not suitable for smaller contracts. Outcomes focussed more on waste prevention rather than waste management. The managing and sorting of waste is only beneficial if there are recovery processes available.

8b(1). Do consultees have further views on the inclusion of a site waste management plan as part of the sustainability labelling at the Gold level? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer: **N/A**

(2) Materials maintenance document: Often building materials are not specified for 'sustainable' reasons although selection can be justified by a several reasons including cost, durability, aesthetics, buildability statutory requirements, thermal performance, labour expertise or availability or for ease of maintenance. A building material may be used as a component as part of an overall building strategy.

A school is generally viewed as a key building in the local community and stewardship perceived as a collective responsibility. It is proposed that a materials maintenance document should outline the key materials (including materials characteristics, anticipated lifespan and any maintenance requirements) used in the construction. Understanding the nature of the materials used and any maintenance required to the building could extend the useful life of building and minimise

disruption due to potential neglect of upkeep. A simple form of communicating the intentions of the designers can bridge the information gap between the technical specifiers and those with responsibility for stewardship of the built fabric (facilities managers, estates departments or school janitors).

The document would not benchmark a building material but to inform a building occupant of the decisions that were made when selecting the material. Although no 'rating' is be given for the material, the designer would have to consider/ or justify the material thereby raising awareness of the benefits of the whole lifecycle cost of the material.

It is proposed that the document would outline the material and material composition of the key components of a building such as super structure, secondary structure and building envelope.

For each key component the designer would be required to:

a) identify a building material
b) define its performance characteristics, proposed expected lifecycle,
c) maintenance requirements (describe maintenance procedure).

There may be an opportunity for the materials document to align with the new materials library as developed by SUST and be included as part of the information required within the building users guide. The document could have many educational benefits such as publicly raising the awareness on the complexities of material sourcing and highlighting that 'sustainable specified materials' are dependent on diverse factors that alter during a building's life. It could also be a tentative first step in the long-term goal of the Sullivan Report's ambition of total-life zero carbon buildings by 2030.

Particular interest groups or industry representatives may criticise a sustainability label awarded to a building that uses a particular material which may have been produced from a finite resource or is transported from a distant country.

8b(2). Do consultees have further views on the inclusion of material maintenance document as part of the sustainability labelling at the Gold level? Yes ☐ No ☐

Where appropriate, please provide comment in support of your answer:
N/A

(3) Design and detailing for de-construction at the start of a project enables a building, at the end of its useful lifespan, to be a future resource and help "close the loop" for resource use. It also designs out future risk and cost by ensuring that building

elements and products can be quickly and easily maintained and replaced. This is particularly important if they become unacceptable under future environmental legislation which is an increasingly common occurrence. Detailing for deconstruction makes a building more attractive as an investment opportunity.

Reducing wastefulness of the built-form through encouraging demountable construction offers a practical route towards sustainable development via a long-life, loose-fit approach. Further information on the principles of designing for deconstruction can be found through the SEDA website here.

However it may present difficulties for designers and verifiers. Often a warrant is submitted with very little detailed information on the construction of component parts and verifying design and detailing for deconstruction would require information for a school design to be progressed considerably further than is typically done. Including design and detailing for de-construction would require significant additional training to enable this to be verified.

8b(3). Do consultees have further views on the inclusion of design and detailing for de-construction as part of the sustainability labelling at the Gold level? Yes ☐ No ☐

Reasons for answer
N/A

9. Optimising Performance

Standard 6.8 of the Technical Handbooks requires occupiers of a building to be provided with written information by the owner on the operation and maintenance of the *building* services and energy supply systems. The information provided under standard 6.8 is more appropriate to the maintenance staff for the building.

Sustainable principles are high on the educational agenda with schemes such as Eco-Schools and Grounds for Learning intended to encourage schools to take action to improve their environmental performance and understanding.

A school designed to be energy efficient will only be energy efficient in practice if it is operated in the way it was intended. The maintenance staff will be responsible for the overall operation and maintenance of the building and its building services. However the users (pupils and teaching and administration staff) can contribute to the successful operation in their local areas.

9. a. User information guide.

This aspect looks to offer guidance appropriate to the users of buildings on the ways in which building fabric and building services for the school are intended to function and how they can optimise its performance locally within their classrooms or other teaching areas. The guidance will explain inter-relationships between issues such as insulation, heating and ventilation; use of windows, ventilators and equipment controls and LZCT if appropriate.

As systems and technologies are developed to meet improvements in energy and carbon standards, the fabric and services are becoming more complex and the use of building-integrated renewable technologies such as micro wind turbines, photovoltaic arrays, and solar hot water systems increase. The correct use and maintenance of building services equipment is essential if optimal energy efficiency is to be achieved from such equipment.

The guidance will look at the behavioural issues related to the school user and should highlight links between passive and active measures to emphasise a greater understanding of the relationships between:

- heat loss, heat gain and cooling through both fabric and ventilation
- the provision of fresh air from mechanical or natural means
- different building strategies appropriate for summer and winter operation
- controlling natural and artificial lighting.

A school designed to be energy efficient will only be successful if occupants appreciate how it was intended to be operated. To assist occupants in understanding where energy is being used in a building, a visual device could be used to raise awareness of energy use and to alert occupants if one or more of the systems stop working.

A Quick Start Guide was introduced for the domestic sustainability labelling and the principles well received by both designers and building users. The proposed guidance for schools would build upon the approach developed in the domestic labelling system, a link of which can be found below.
http://www.scotland.gov.uk/Resource/Doc/217736/0118061.pdf

The guide would be concise non technical and accessible to all, using diagrams and coloured presentations. The information would be available in digital format to allow it to be made available as a printed guide and/or be stored online on a central server perhaps to be used on a TV information board, a server screen savers for the schools equipment or part of a home screen where Wi-Fi is available.

For further details on proposals please refer to the accompanying draft guidance document

9a. Do consultees agree with the criteria for a user information guide? Yes ☐ No ☐

Reasons for answer **N/A**

9b Resource use display

To assist building users to monitor energy consumption it is proposed that a resource use monitor is made publicly accessible to all users.

The first upper level would have a real-time resource use monitor at the principal entrance area to the building displaying electricity use. In addition, for the second upper level monitors would also be located in all teaching spaces and the data could be collected centrally to allow for comparison over a period of time.

9a. Do consultees agree with the criteria for a resource use display as part of the user information? Yes ☐ No ☐

Reasons for answer **N/A**

10 General

Do consultees have any other comments on the proposals?

Comments
We have limited our comments to the Acoustic aspects of the proposed document as this is our key area of expertise.