Report on the Quality of School Design
for NI Audit Office

February 2009

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Introduction:

Knox & Clayton Architects have been employed by the Northern Ireland Audit Office (NIAO) to undertake an independent assessment of the design quality of a selection of new-build schools.

16 no. schools were selected as offering a reasonable, representative sample of recently completed works to schools in Northern Ireland. They fall into one or more of the following sectors:

Primary or Secondary schools of varied classroom bases;
Education Board, Irish medium, NICIE or Maintained sector schools;
Various procurement routes (PPP, traditional JCT, design & build); and
New-build (on the same or alternative site) / or extension & refurbishment works.

Name of School	Year Works Completed	Age of Works	Nature of Works	Educational Provider	Procurement Route
Ballyholme Primary School, Bangor	2008	1	Extension & Refurbishment	SELB	Traditional
Bangor Academy, Bangor	2008	1	New build on new site	SELB	PFI / PPP
Saintfield High School, Saintfield	2006	2	Extension & Refurbishment	SELB	Traditional
Oakgrove Integrated College, Londonderry	2004	4	New Build	WELB / NICIE	PFI/PPP
Holy Cross College, Strabane	2008	1	New build on new site	CCMS	PFI / PPP
Creggan Primary School, Randalstown	2006	2	New build on new site	CCMS	Traditional
Damhead Primary School, Coleraine	2003	5	New Build	Controlled	Traditional
Cranmore Integrated Primary, Belfast	2001	7	New build on new site	SEELB / NICIE	Traditional
Bunscoil an t'Sleibhe Dhuibh, Belfast	2005	3	New Build	Irish Medium	Traditional
Maralin Village Primary School, Maralin	2007	1	New build on existing site	SEELB	Traditional
Cavehill Primary School, Belfast	2003	5	New build on existing site	BELB	Traditional
St Mary's Primary School, Omagh	2002	6	New Build	CCMS	Traditional
Gibson Primary School, Omagh	2003	5	New Build	WELB	Traditional
Kilmaine Primary School, Bangor	2005	3	New build on existing site	SELB	D & B
Harberton Special School, Belfast	2007	1	New build on exiting site	SEELB	Traditional
Holy Trinity Primary, Cookstown	1999	9	Extension & Refurbishment	CCMS	Traditional

Aims of Good Design in practice:

Aspects of the building designs that we have taken into account during our visit and analysis include:

Appearance: Has the building been designed to respect and compliment its surroundings, and to attract a favourable response from its users? The building should be welcoming, non-institutional aesthetically and portray individual character.

Context: The building form should be seen as an extension of its surroundings and a creation of public / private space contributing to the life of its environment and surroundings.

Buildability: Construction materials should have been chosen to suit context and allow for ease of construction. It should be built on whole life cost principles, balancing aesthetic considerations with material robustness and suitability throughout.

Maintenance: The chosen materials should give comfort to users; create a positive and welcoming feel, whilst offering a robust and user-friendly building.

Functionality in use: The building should be fit for purpose and responsive to a changing curriculum. Good usage of space, signage, navigation around the building, adaptability and accessibility to all users.

The inclusion of good levels of natural light is key to providing quality spaces for educational purposes. This applies equally to circulation spaces where good lighting design can affect the friendliness and welcoming nature of a particular space. If the spaces are convivial to pass through, to visit and to frequent, pupils will be more comfortable in them and using them. This can help assist in cutting down on incidences of bullying throughout the school, showing how considered design can add social benefits.

Many studies have also concluded that high levels of natural light in classrooms helps increase academic performance of pupils and creates a friendly, positive space for active working. Windows should be suitably sized to allow in enough light while also providing sufficient openable vents for adequate natural ventilation opportunities. If windows are too large on facades facing south, this can lead to strong glare or overheating in summer months, as too large windows on the north could lead to increased heating costs.

By optimising passive solar orientation, proper building massing and the use of solar shading on south facing glazing, a modern school design should aim to provide both thermal comfort and efficient running costs. A building orientation should aim to minimise undesirable solar gains during the summer months and maximise desirable solar gains during winter months, without suffering from glare from a low-lying sun.

Good lighting provision is an important element of any design as it can ensure appropriate visual comfort, optimise aesthetics, minimise glare illumination, and provide potential energy savings through efficiency.

Careful consideration should always be given to the proportions of teaching rooms and the design of windows to ensure the provision of good daylight and natural ventilation. Over the longer term adaptability is needed over the life of the building to allow internal walls to be moved or to change the size and use of spaces and for an evolving curriculum.

High volumes of air in classrooms can help lessen the build-up of CO_2 and, in conjunction with a solid ventilation and air movement strategy, combat afternoon sleepiness, helping concentration levels to be retained throughout the school day. A raked ceiling, rather than a conventional flat ceiling, can provide a greater volume of air, helping facilitate this improvement as well as adding a greater sense of space.

There also exists a conflict between providing good means of natural ventilation (via window openings) and ensuring that the acoustic integrity of the internal space is retained. This can prove to be an issue where the school is located near to a busy road. If the design necessitates the manual opening of windows by users (as is generally preferred) then nearby traffic noise can sometimes impinge on the ability to teach a class within the space. The preference for natural ventilation solutions will generally include this potential compromise in acoustic performance.

Choices of colour and material can have profound effects on a building user's mood. This applies equally to visitors as well as those who work or attend classes within the building on a daily basis.

It is imperative to remember how an inspiring design can both be affordable, direct and engaging whilst satisfying all statutory regulations and exhibiting best practice in approach. Good design should respond to a wide variety of influences, ideas, site restrictions, user requirements and functionality issues, along with taking into account future-proofing ideas and the potential incorporation of future spatial adaptability.

The internal and external environment should provide good quality and safe learning and working environments for all, with attractive support and personal spaces used to encourage well being, self esteem and a sense of ownership. The building should help to forge a positive relationship between the school and local community and help instill a sense of pride in its users.

To allow for future changes, flexibility and adaptability are key design features which should be considered and incorporated into any design. Flexibility can be implemented into the design to allow the rearrangement of the internal environment to allow for different spaces to be multi-functional. With the aid of moveable partitions room areas are able to increase or decrease in size to suit a particular need.

The external appearance of a school is a major influence on how the site is perceived by the public at large. Proposals should include considered landscape development with the objective of providing a high standard of design to integrate the building into the surrounding built environment whilst reflecting the local traditions of layout, form and materiality. The building should be respectful of its context, strengthening the identity of the local surroundings and its landscape and the design of each element should come together to be seen as an homogenous whole.

Whilst not strictly within the remit of the school's architect, schools that utilise their own sense of design in the building can many times help to enhance their space. Creating a more adult feel within staff administration areas can help differentiate between areas where pupils can openly visit or interact and where education professionals work together. Artwork on walls, a simple yet effective addition, can lift spaces and add the ambience of a commercial, professional office space. The creation of differing moods each reflecting a specific spatial use, tied together within one overall conceptual vision for the building's appearance, can help with orientation, understanding and user comfort.

In short, many factors must be considered during the process, and the final design is formed out of an amalgamation of all these ideas. To help score the quality of each school design we adopted, from the Commission of Architecture and the Build Environment (CABE), their *'Good Design Assessment Criteria'.* From this we developed an individual assessment questionnaire, in consultation and discussion with both NIAO and the Department of Education, adding a further breakdown of each individual criteria for ease of understanding and marking.

The ten chosen assessment points for scoring are as follows:

1: Good clear organisation, an easily legible plan, and full accessibility

2: Spaces that are well-proportioned, efficient, fit for purpose and meet the needs of the curriculum

3: Circulation that is well organised, and sufficiently generous

4: Good environmental conditions throughout, including appropriate levels of natural light and ventilation

5: Attractiveness in design, comparable to that found in other quality public buildings, to inspire pupils, staff and parents

6: Good use of the site and public presence as a civic building wherever possible to engender local pride

7: Attractive external spaces with a good relationship to internal spaces and offering appropriate security and a variety of different settings

8: A layout that encourages broad community access and use out of hours, where appropriate.

9: Robust materials that are attractive, that will weather and wear well and that are environmentally friendly

10: Flexible design that will facilitate changes in the curriculum and technology and which allows expansion or contraction in the future, where appropriate.

Criteria Point 1:

' Good clear organisation, a clear plan and full accessibility...'

Our scoring breakdown of the above criteria was:

1.1 Is the accommodation laid out in a logical, easy to understand manner e.g. are key stages grouped together? Are public areas clearly identified?

1.2 Is it easy to orientate yourself & to find your way around the building? (Good signage, clear colouring etc..)

1.3 Is the building easily accessible both within and without for users with differing disabilities i.e. sight, hearing, mobility?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown was scored with section **1.1** being worth 4, **1.2** worth 2 and **1.3** worth 4 marks. This total score for the school, out of the possible 10, was then subject to a category weighting uplift of 1.5, leaving a possible maximum total score of 15.

The average score achieved, from a possible maximum of 15, was **12.28**.

This was a category that most schools managed to score highly on, with two schools being given the highest possible score of 15. Seven schools scored 13.5, and three others scored 12. New schools on clear, open greenfield sites generally scored highest, due to the inherent ability of the design team to organise the new school in a sensible and coherent manner from the start. There are no physical or practical constraints on room arrangement.

The bottom three examples in this criteria, in terms of achieved final score, were all 'extend and refurbishment' projects. This was indicative of the school having to adapt around existing buildings and to accept certain compromises in order to provide the necessary accommodation on a constricted site. The lowest score of 6 was given to the oldest project in the survey, where this was mainly due to the nature of the site and the lack of available space for adequate extension.

Newer schools also tended to score more highly in this criteria, due to the available marks in breakdown **1.3**. Several of these points have now become statutory requirements in recent years, meaning newer schools would by law have been compelled to include them in their design. Level access to all external doors, no internal changes of level, hard-of-hearing induction loops and adequate door or directional signage are all less likely to be achievable in extend and refurbishment projects.

Good examples:

- Ease of orientation with clear visual constraints to distinguish floor, wall and ceiling planes, door surrounds etc.
- Movement is unimpeded and unobstructed.
- Accommodation laid out in a logical easy to understand manner.

- The use of colour, textures, lighting and signage contribute to the clarity within the school and ease wayfinding.
- Visual connections to adjacent spaces ease orientation.
- Universal accessibility and circulation routes easily distinguished with clean and appropriate signage.

<u>*Bad examples:*</u>

- Excessively monochromatic colour schemes should be avoided.
- Lack of signage hinders the direction of movement.
- Long and continuous circulation areas.

- Movement at circulation area should be unimpeded and unobstructed.
- Contrasting and cold patterns to floor cause confusion for people with visual disabilities, glossy floor finishes give rise to reflection and possible glare.

Criteria Point 2:

' Spaces that are: well -proportioned, efficient, fit for purpose, meet end users needs...'

Our scoring breakdown of the above criteria was:

2.1 Are classrooms and ancillary accommodation of sufficient size and shape for the intended purpose?

2.2 Are fixtures and fittings adequately provided and of the appropriate scale for the intended children e.g. interactive white boards, display boarding, cupboards, sink units?

2.3 Is the relationship between class and cloakroom area appropriate for age and stage of pupils?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown (for primary schools) was scored with section **2.1** being worth 4, **2.2** worth 3 and **2.3** worth 3 marks. For secondary schools point **2.3** was removed, with **2.1** and **2.2** both being worth 5 each.

This total score for the school, out of the possible 10, was then subject to a category weighting uplift of 1.5, leaving a possible maximum total score of 15.

The average score achieved, from a possible maximum of 15, was **12.19**.

This again was a category that most schools managed to score highly on, with two schools being given the highest possible score of 15. Five schools scored 13.5 and five others scored 12. The lowest score was 7.5.

Newer schools generally scored higher in this category as it is easier to ensure spaces and rooms are organised correctly and proportionally, and equipment is provided to the most up-to-date standards.

Where schools scored low marks in this category the reasons were predominantly due to poor choices in the general arrangement of rooms or the relationship of key spaces to one another, with cloakrooms in primary schools being a particular issue.

Good examples:

- Good visual and distinctive relationship between classroom and cloakroom.
- Parent's noticeboard for information activities in cloakroom.
- Innovative thinking of trough sink fixture allowing 2 pupils to work side by side. Visual constraints to tap side.

- Appropriate colour co-ordination of fixtures and fittings and well portioned.
- Centralised teacher desk to facilitate demonstrations.

Bad examples:

- Inadequate storage and shelving facility for coats, bags, lunchboxes.

- Lack of storage facilities.
- No designated space for comms area.

Criteria Point 3:

'Well organised, with sufficiently generous circulation...'

Our scoring breakdown of the above criteria was:

3.1 Is circulation space direct enough to avoid undue travel between areas?

3.2 Is the circulation generous enough to avoid over-crowding or bottlenecks at certain times of day?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown was scored with section **3.1** and **3.2** both worth 5 marks each.

This total score for the school was a possible 10 as this category was not adjusted after weighting.

The average score achieved, from a possible maximum of 10, was **8.06.**

This again was a category that most schools managed to score highly on, although only one school was given the highest possible score of 10. Four schools were awarded a score of 9, six scored 8 and the remaining five others scored 7.

The highest scoring schools in this category tended to be the smaller base schools, due to the ease and simplicity of movement around their corridors.

Larger schools require a much greater level of logistical organisation and forethought to arrive at a suitable solution to overcome circulation issues. Secondary schools also have many more, and bigger, pupils to move around between classes which adds a further complication to the adequate provision of circulation routes.

The other main area that suffers from possible overcrowding issues is outside the dining hall. Even with staggered lunches there are generally overcrowding issues simply due to numbers.

Whilst corridors are generally wider in large primary or secondary schools, this is not normally to such an extent to fully alleviate the pupil movement issues that occur.

Queuing outside classrooms, a typical secondary school occurrence, is a further issue that can cause bottlenecks in some corridors. One way to help alleviate this is simply to ensure classrooms are accessed only from one side of a corridor, leaving the other side free for passing. If this is not possible then care should be taken to ensure classroom doors are not positioned directly opposite to each other.

Design comments under Assessment Criteria point 3: Generous Circulation

Good examples:

- Adequate circulation space for universal accessibility.
- Allowance for class groups to pass each other.

- Spacious circulation routes direct enough to avoid undue travel distances to surrounding spaces.

Bad examples:

- Inadequate width in corridors leads to congestion of pupils, especially at peak times.

- Pupils movement suffers from bottleneck at corridors at key spaces, i.e. at dining halls

<u>*Criteria Point 4:*</u>

' Good environmental conditions, including appropriate levels of natural light & ventilation...'

Our scoring breakdown of the above criteria was:
4.1 Are there appropriate levels of natural light throughout the building?

4.2 Are there sufficient opportunities for natural ventilation e.g. openable windows? Are there localised heating / thermostat controls for each room?

4.3 How would you rate the general quality of acoustics in key spaces?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown (for primary schools) was scored with section **4.1** being worth 4, **4.2** worth 4 and **4.3** worth 2 marks. For secondary schools point **4.3** was removed, with **4.1** and **4.2** both being worth 5 each.

This total score for the school, out of the possible 10, was then subject to a category weighting uplift of 1.5, leaving a possible maximum total score of 15.

The average score achieved, from a possible maximum of 15, was **11.16.**

Only one school was given the maximum score of 15 in this category. This was for a continuous, thoughtful and consistently good approach to the use of natural light throughout, and for including a well designed heating and ventilation strategy. Other schools lost points for not being ambitious enough to bring in natural light to corridors, to the rear of classrooms or to key spaces. The benefits of natural light are obvious, as discussed in detail elsewhere in this report.

Natural ventilation is important, as the simplicity of opening a window to allow in fresh air is self-evident. The psychology aspect of having environmental control is also a positive tool for end users. Where this can falter is when this opening of a window allows external noise, from neighbouring buildings or traffic, to disrupt the teaching spaces. The influx of cold air can also be an issue, conflicting with the heating strategy. Often there is no simple answer to this dilemma and a balance must be struck between all elements.

One thing to consider with regard to acoustics is to always ensure to build up room dividing walls to the underside of the roof structure. This avoids above-ceiling transfer of sound. Whilst obvious in classroom situations, this is also important in administration areas where issues of confidentiality and privacy are paramount.

Glazing and door specification from corridors or social spaces into classrooms are also important to ensure classes are not unnecessarily disrupted by external noise.

Good examples:

- Natural day-lighting creates a warm and welcoming atmosphere.
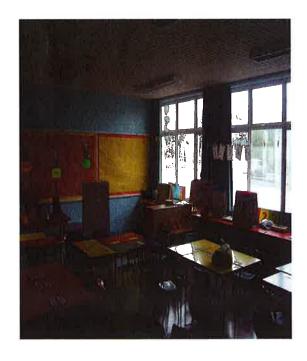

- Natural day-lighting maximising screen performance.
- Minimises energy usage.

Bad examples:

- Inadequate daylighting and uneven levels of lighting throughout the classroom.

- Inadequate floor to ceiling height for depth of classroom away from window wall, to allow benefit of natural daylight.
- Inadequate penetration design for ventilation process.

<u>*Criteria Point 5:*</u>

'Design quality that is comparable to that of other quality public buildings...'

Our scoring breakdown of the above criteria was:

5.1 How would you rate the design of the building in relation to other schools which you have visited? Is it pleasant to look at, welcoming to visit and a positive place to work in?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. We had no breakdown of points within this category, so we proceeded to mark each school directly out of a possible 10 marks.

This total score for the school, out of the possible 10, was then subject to a category weight lowering of 0.5, leaving a possible maximum total score of 5.

The average score achieved, from a possible maximum of 5, was **3.81**.

This criteria is perhaps the most subjective in the survey.

A direct comparison to other schools, even when given in the form of an opinion from the staff members and principal, is a difficult thing to measure. Most schools agreed their building was a good and positive place to work, but this admittance can be related to the staff ethos and friendliness and is not necessarily indicative of the building's design quality.

The comparison to public buildings other than other schools, as implied by the original question rather than our more simplified interpretation, is even more difficult to quantify. Schools were scored based on a general overview of many other criteria points; good site presence, elevation treatment, impact of main entrance, choice of materials, spatial awareness and quality of light, the overall strength of the building's design holistically, etc..

Only one school was given the maximum score in this category, mainly for its front entrance approach and material presence. Although on a tight site in an urban setting, it managed to impart a sense of place and of scale that was considered worthy of full marks.

<u>*Design comments under Assessment Criteria point 5: Design Quality comparison*</u>

Good examples:

- Promotes character by responding to rural community and local culture.
- Promoting quality and favourable response from end users and wider public

Contribution to local community and surrounding environment.
Creation of landmark building.

- Promotes high quality design, attractive, secure and functional.

- Character not evident within design, without civic significance.

- Entrance scenario, suffers from legibility and welcoming atmosphere.

Criteria Point 6:

'Good use of the site, good public presence as a civic building...'

Our scoring breakdown of the above criteria was:

6.1 Has the site been well utilised, and have the individual character and identity of the school been retained or enhanced by the design?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. We had no breakdown of points within this category, so we proceeded to mark each school directly out of a possible 10 marks.

This total score for the school, out of the possible 10, was then subject to a category weight lowering of 0.5, leaving a possible maximum total score of 5.

The average score achieved, from a possible maximum of 5, was **3.97.**

As with criteria point 5, this is a subjective category and is something difficult to objectively measure.

For insight into the change or enhancement of the school's character we had to rely on the opinions of the school principal and key staff members. Although there is always the potential that something may be lost in terms of character, experience or atmosphere when an established school is replaced by a sterile, new building, this seemed not to be the case in any example we visited. The school ethos is perhaps something carried by the staff, rather than housed by a building. In all cases it was agreed the new works were a definite and positive addition to the school.

In terms of site and public presence each building was judged on its own context and siting. No schools were given the maximum score in this criteria, but four schools scored 4.5. The lowest score, shared by two schools, was 3.

Good examples:

- Identity of school highlighted by entrance scenario and individual character enhanced giving public presence.

- Good utilisation of tight site with internal courtyard designed into school.

Bad examples:

- Little character and individual identity.

- Entrance scenario lacks character and presence.

<u>*Criteria Point 7:*</u>

'Attractive external spaces with good relationships to internal spaces. Appropriate security and a variety of different settings...'

Our scoring breakdown of the above criteria was:

7.1 Is the external environment / landscape pleasant and does it relate well to the internal accommodation? e.g. is there easy access to play areas?

7.2 Does the site layout meet the security needs of the school? Are you aware of any specific issues regarding security issues in or around the site that could have be addressed better? Was there any discussion with the PSNI Architectural Liaison Officer during the design stages, to your knowledge?

7.3 Are there a variety of settings e.g. hard play area, grass play area, garden environment and safety surfacing available for use?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown (for Primary schools) was scored with section **7.1** being worth 2, **7.2** worth 5 and **7.3** worth 3 marks. In Secondary schools the section **7.3** was removed and **7.1** worth 4 and **7.2** worth 6 marks.

This total score for the school was a possible 10 as this category was not adjusted after weighting.

The average score achieved, from a possible maximum of 10, was **7.31.**

Security is a key aspect for any school and some of the lower scores given here reflect the importance of this being fully and completely addressed in all instances. The boundary fencing to the school grounds should be the starting point for inhibiting unwarranted entry. The fence should be strong, min,. 2.4m high and offer visibility through. Good observation and supervision are the key to successful boundary security.

Edge planting should be at low level to avoid the potential for intruders to hide behind and robust enough to discourage unwanted foot crossing of planted areas. Good external lighting is paramount, providing the school is also designed appropriately to avoid well lit alcoves, alleys or covered areas that could help encourage intruders to congregate there. The main entrance should also include a controlled foyer to inhibit people from free access to the school and allow the school to scrutinise visitors prior to entry.

The variety of external surfacing or setting is more applicable to primary schools, so was removed from the secondary school scoring criteria breakdown. No school achieved a maximum score in this criteria, although four schools each scored 9. The lowest score was shared by two refurbishment projects with little to no quality external spaces, one of which also had no controlled access reception space.

Good examples:

- Excellent landscaped courtyard relating well to the internal layout.

- Good access to external courtyard
- Relates to entire school building

Hard, soft landscaping which acts as a courtyard for overlapping uses.
Visible from all circulation areas.

<u>*Bad examples:*</u>

- Poor relationship to internal spaces.
- Lack of design quality in regards to landscaping.

- Wasted opportunity to utilise external area.

Criteria Point 8:

'Layout that encourages broad community access and use out of hours where appropriate...'

Our scoring breakdown of the above criteria was:

8.1 Does the school layout easily allow for community access and activities including out of school hours use where appropriate? Is relevant accommodation arranged in such a way as to not undermine the security of the rest of the school, e.g. is the multi-purpose hall convenient to the entrance and toilet facilities?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. We had no breakdown of points within this category, so we proceeded to mark each school directly out of a possible 10 marks.

This total score for the school, out of the possible 10, was then subject to a category weight lowering of 0.5, leaving a possible maximum total score of 5.

The average score achieved, from a possible maximum of 5, was **3.81**.

Again, no school scored the maximum available points in this criteria. Four schools scored 4.5. The lowest score was 2.5.

This category is not specifically or totally related to the design quality of the school building. Some aspects of the room adjacencies, door positions and security provisions do factor on the potential suitability of the school to cater to external functions. But the actual ability of a school to function as a community building may be controlled by external factors, including the management and maintenance costs.

Most schools had the *potential* to be used by the community, but the practicalities in term of insurance, maintenance, staffing levels, security and damage, double cleaning etc.. combine to make it generally prohibitive for most schools to consider. Other clubs and organisations can offer similar facilities at a much reduced cost, making the possibility of competing on a commercial level practically impossible.

Good examples:

- External community access to the main hall allowing ease of access and security to remainder of school.
- Promoting community involvement.

Bad examples:

- Hall is situated at rear of school, which does not promote community usage.

Criteria Point 9:

'Robustness of finishes and environmental qualities…'

Our scoring breakdown of the above criteria was:

9.1 Are the internal and external materials / finishes attractive yet robust enough to withstand the weathering or constant use and wear & tear expected in a school?

9.2 Are you aware of any deliberately chosen environmentally friendly inclusions e.g. sensor lighting controls, choice of fuel for heating?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown was scored with section **9.1** and **9.2** each being worth 5 marks.

This total score for the school was a possible 10 as this category was not adjusted after weighting.

The average score achieved, from a possible maximum of 10, was **6.38.**

This criteria was the lowest on average over all the scoring criteria. Only one school achieved the top score of 10. Most marks were lost in section **9.2** as environmental features are in many instances not generally considered economically justifiable to include.

On **9.2**, more recent buildings would again have a scoring advantage over older buildings as some technologies have become more common, more affordable and easier to integrate into the provided mechanical or electrical control systems. Under recently introduced procurement routes, the project may have been contractually stipulated to achieve a specific BREEAM rating, which may have driven the necessity for inclusion of specific technologies in order to comply. The substantial change in Building Control regulations in November 2007 may also have affected the most recently completed projects in the survey.

One conflict with the chosen materials is the perceived dichotomy between robustness and attractiveness. Hard-wearing materials such as brick and facing blockwork do not always make for the most appealing internal finishes. The practical reasons for their use, from a maintenance perspective, is obvious, but the potential exists for a loss of coherence, brightness and the inspirational finish that schools should aim to produce. There is a trade-off to be made between having welcoming communal areas that are potentially easily damaged and required maintenance schedules for the school to adhere to. The best or correct decision either way is not always obvious and can be specific to the wishes of each individual school.

<u>Design comments under Assessment Criteria point 9: Robustness of Finishes</u>

<u>*Good examples:*</u>

- Good detailing of rain water good with low maintenance soffits and eaves.
- Good grey water harvesting and passivent ventilation.

- Robust use of internal brick panel in main hall proved successful and low maintenance

Bad examples:

- Poor detailing at main hall with junction of structure / door / skirting creating health and safety risk and unattractive finish.

- The use of timber cladding should be properly specified and treated.

Criteria Point 10:

'Flexibility of design in order to facilitate changes in policy and technology and expansion or contraction...'

Our scoring breakdown of the above criteria was:

10.1 Can the school physically expand / can internal spaces readily be reorganised to meet future changes in the curriculum or to accommodate fluctuation in future pupil numbers?

10.2 Can technological advances such as new ICT developments later be easily accommodated if required?

For ease of use, and continuity across all categories, each criteria was capable of scoring 10 points. The above breakdown was scored with section **10.1** and **10.2** each being worth 5 marks.

This total score for the school was a possible 10 as this category was not adjusted after weighting.

The average score achieved, from a possible maximum of 10, was **6.63**.

This was a low scoring category, with the highest score of 8 being shared by three schools. Two schools scored 5.

The ability of a school to extend or be amended to suit alternative layouts or curriculum needs is something which is only nominally considered at design stage. Having an idea of a potential area for future extension is good practice, but should not be an overriding factor in design decisions. Most schools will not be considering any form of change, nor will this typically happen, so should not be a major consideration unless easily accommodated within the already agreed structural or mechanical design.

Future ICT development will no doubt move into a wireless router direction, rather than hardwired trunking installations. This in itself would both be easily available to any school and easily free up the use of any existing spaces for simple transformation into areas for teaching and study.

Design comments under Assessment Criteria point 10: Flexibility
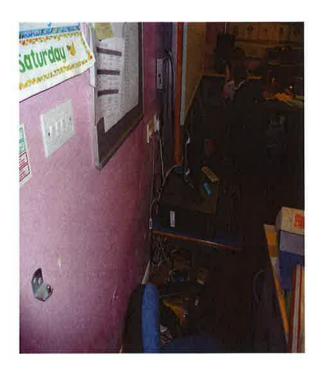
Good examples:

- Overcladding uses at cloakroom for parents information area

- External courtyard as a flexible area for play activities, exterior teaching, circulation routes between school blocks

Bad examples:

- Poor detailing of interactive whiteboard cabling. Poor integration of Architecture and M&E Services.

- Lack of storage facilities can hamper flexibility.

Methodology of approach to scoring:

Due the varied nature of the projects, there are many different ways to approach a scoring of this kind. It was difficult to come to considered and balanced conclusions that are fair to each school, as we tried not to end up judging each building by different standards. With a generalised comparison scoring structure being applied to buildings that are vastly different in scope, we had to agree on a process of scoring based on the impact each element of the chosen criteria had on the _specific_ building in question.

Value judgments had to be made in regard to the specific school size and shape, its final arrangement and materials, its future flexibility etc, but not with a direct, relative comparison to all the other schools viewed within the survey. Each on its own merits.

The reports were carried out by two qualified architects with strong educational backgrounds. Four schools of varying types and sizes were initially visited by both architects to establish a common ground for scoring. The remainders of reports on schools were undertaken individually. HBK architects carried out the Cranmore Integrated Primary school report as Knox & Clayton had designed this school.

Knox & Clayton discussed the scoring criteria with HBK architects through a series of meetings. The scoring methodology was developed by having in-house discussions on the rating of each criteria and how they should score. As the reports developed scores were analysed against each other to ensure each architect was scoring appropriately, and on the same consistent basis across all criteria.

Scoring of schools

The following are the final overall scores for each school project. This is an overview of the performance of each project. Each individual report includes a breakdown of specific scoring used to reach this figure.

Name of School	Age (years)	Nature of Works	Procurement Route	Final Scoring %
Ballyholme Primary School, Bangor	1	Extension & Refurbishment	Traditional	65
Bangor Academy, Bangor	1	New build on new site	PFI / PPP	72.5
Saintfield High School, Saintfield	2	Extension & Refurbishment	Traditional	77
Oakgrove Integrated College, Londonderry	4	New Build	PFI / PPP	78.5
Holy Cross College, Strabane	1	New build on new site	PFI / PPP	83
Creggan Primary School, Randalstown	2	New build on new site	Traditional	83
Damhead Primary School, Coleraine	5	New Build	Traditional	71
Cranmore Integrated Primary, Belfast	7	New build on new site	Traditional	68.5
Bunscoil an t'Sleibhe Dhuibh, Belfast	3	New Build	Traditional	80
Maralin Village Primary School, Maralin	1	New build on existing site	Traditional	80
Cavehill Primary School, Belfast	5	New build on existing site	Traditional	79.5
St Mary's Primary School, Omagh	6	New Build	Traditional	64
Gibson Primary School, Omagh	5	New Build	Traditional	75.5
Kilmaine Primary School, Bangor	3	New build on existing site	Design & Build	88
Harberton Special School, Belfast	1	New build on exiting site	Traditional	85
Holy Trinity Primary, Cookstown	9	Extension & Refurbishment	Traditional	59

Comparative Score Analysis:

The following pages have comparative matrices coloured to show the schools ordered in various ways.

The first shows the school arranged by **'OVERALL SCORE'**, allowing an overview of how each school's score has decreased and how each school scores in direct comparison to others around it.

The second page orders the schools by **'AGE'**, allowing an overview of how schools have scored in consideration to how recently they were completed. This allows the spotting of trends showing improvements in the relative standard of school design over the past nine years.

Each table is colour-coded to clearly identify specific scoring trends. On each, *'green'* denotes scores above 80%, where *'red'* denotes scores equal to or below 60%. Whilst these numbers may be considered arbitrary, after looking at the results and considering the given range of the scores this seemed like the clearest way to highlight a good / poor distinction. Too many scores would have been coloured *'green'* had we decided on '80% or above', where conversely, too few would have been coloured *'red'* had we insisted on simply 'below 60%'. We feel this would have not added clarity to the final tables, as having similar numbers of *'greens'* and *'reds'* certainly allows for a more relevant overall comparison.

Further to the scoring overview tables, two other tables have been included. These show the relative breakdown of scoring compared in tables of **'PRIMARY'** and **'POST-PRIMARY'** schools. This allows at a glance to see how, within our chosen breakdown of each assessment criteria point, the specific marks were originally allocated. On each, *'green'* denotes scores where the sub-category was given full marks, and *'red'* denotes scores equal to or below 50%. Whilst these numbers may again be considered arbitrary, after considering the limited variation of the potential scores in each breakdown this seemed like the clearest and simplest way to highlight a good / poor distinction.

Table 1: showing schools listed in order of achieved score. (green denotes scores above 80%; red denotes scores equal to or below 60%)

SCHOOL NAME	AGE	1- Clear Organisation	2- Well-Proportioned Spaces	3- Generous Circulation	4- Environmental Conditions	5- Design Quality comparison	6- Good Public Presence	7- External spaces & Security	8- Community Use out of hours	9- Robustness of Finishes	10- Flexibility for future change	TOTAL
Kilmaine Primary	3	13.5	13.5	8	15	4.5	4	9	4.5	9	7	88
Harberton School	1	13.5	13.5	9	12	5	4.5	9	4.5	7	7	85
Holy Cross College	1	13.5	13.5	7	13.5	4	4	9	3.5	7	8	83
Creggan Primary	2	15	15	10	12	4.5	4.5	6	3	5	8	83
Maralin Primary	1	15	12	9	12	4	4.5	7	3.5	7	6	80
Bunscoil an T'Sleibhe Dhuibh	3	13.5	15	9	13.5	4	4	7	4	5	5	80
Cavehill Primary	5	13.5	12	8	7.5	4	4	9	4.5	10	7	79.5
Oakgrove College	4	13.5	13.5	7	10.5	4	4.5	9	3.5	6	7	78.5
Saintfield High	2	10.5	12	7	13.5	4	4	8	4	7	7	77
Gibson Primary	5	12	13.5	9	10.5	4	4	7	4.5	5	6	75.5
Bangor Academy	1	10.5	12	8	12	3.5	4	7	3.5	6	6	72.5
Damhead Primary	5	12	10.5	8	9	3.5	4	8	4	5	7	71
Cranmore IPS	7	13.5	10.5	8	7.5	3.5	3	6	2.5	6	8	68.5
Ballyholme Primary	1	9	12	7	9	3	3.5	5	3.5	7	6	65
St. Mary's Primary	6	12	7.5	8	10.5	3	4	6	4	4	5	64
Holy Trinity PS	9	6	9	7	10.5	2.5	3	5	4	6	6	59
AVERAGE SCORE		12.28	12.19	8.06	11.16	3.81	3.97	7.31	3.81	6.38	6.63	75.59
MAX SCORE AVAILABLE		15	15	10	15	5	5	10	5	10	10	100

Table 2: showing schools listed in order of age. (green denotes scores above 80%; red denotes scores equal to or below 60%)

SCHOOL NAME	AGE	1- Clear Organisation	2- Well-Proportioned Spaces	3- Generous Circulation	4- Environmental Conditions	5- Design Quality comparison	6- Good Public Presence	7- External spaces & Security	8- Community Use out of hours	9- Robustness of Finishes	10- Flexibility for future change	TOTAL
Harberton School	1	13.5	13.5	9	12	5	4.5	9	4.5	7	7	85
Holy Cross College	1	13.5	13.5	7	13.5	4	4	9	3.5	7	8	83
Maralin Primary	1	15	12	9	12	4	4.5	7	3.5	7	6	80
Bangor Academy	1	10.5	12	8	12	3.5	4	7	3.5	6	6	72.5
Ballyholme Primary	1	9	12	7	9	3	3.5	5	3.5	7	6	65
Creggan Primary	2	15	15	10	12	4.5	4.5	6	3	5	8	83
Saintfield High	2	10.5	12	7	13.5	4	4	8	4	7	7	77
Bunscoil an T'Sleibhe Dhuibh	3	13.5	15	9	13.5	4	4	7	4	5	5	80
Kilmaine Primary	3	13.5	13.5	8	15	4.5	4	9	4.5	9	7	88
Oakgrove College	4	13.5	13.5	7	10.5	4	4.5	9	3.5	6	7	78.5
Cavehill Primary	5	13.5	12	8	7.5	4	4	9	4.5	10	7	79.5
Gibson Primary	5	12	13.5	9	10.5	4	4	7	4.5	5	6	75.5
Damhead Primary	5	12	10.5	8	9	3.5	4	8	4	5	7	71
St. Mary's Primary	6	12	7.5	8	10.5	3	4	6	4	4	5	64
Cranmore IPS	7	13.5	10.5	8	7.5	3.5	3	6	2.5	6	8	68.5
Holy Trinity PS	9	6	9	7	10.5	2.5	3	5	4	6	6	59
AVERAGE SCORE		12.28	12.19	8.06	11.16	3.81	3.97	7.31	3.81	6.38	6.63	75.59
MAX SCORE AVAILABLE		15	15	10	15	5	5	10	5	10	10	100

Table 3: showing PRIMARY SCHOOLS achieved score by criteria breakdown. (*green denotes full marks in individual sub-category; red denotes a score of 50% or less*)

ASSESSMENT CRITERIA	BREAKDOWN (value /10)	Kilmaine Primary	Harberton School	Creggan Primary	Maralin Primary	Bunscoil an T'Sleibhe Dhuibh	Cavehill Primary	Gibson Primary	Damhead Primary	Cranmore IPS	Ballyholme Primary	St. Mary's Primary	Holy Trinity PS
1- Clear Organisation	1.1 (4)	3	4	4	4	4	3	3	3	4	2	3	2
	1.2 (2)	2	2	2	2	2	2	2	2	2	1	2	2
	1.3 (4)	4	3	4	4	3	4	3	3	3	3	3	1
2- Well-Proportioned Spaces	2.1 (4)	4	4	4	4	4	4	3	3	2	4	2	2
	2.2 (3)	3	3	3	2	3	2	3	3	3	2	2	2
	2.3 (3)	2	2	3	2	3	2	3	1	2	2	1	2
3- Generous Circulation	3.1 (5)	4	4	5	5	5	4	4	4	5	2	4	3
	3.2 (5)	4	5	5	4	4	4	5	4	3	5	4	4
4- Environmental Conditions	4.1 (4)	4	4	3	2	4	2	3	2	3	3	2	2
	4.2 (4)	4	3	3	4	3	2	3	3	1	2	3	3
	4.3 (2)	2	1	2	2	2	1	1	1	1	1	2	2
5- Design Quality comparison	5.1 (10)	9	10	9	8	8	8	8	7	7	6	6	5
6- Good Public Presence	6.1 (10)	8	9	9	9	8	8	8	8	6	7	8	6
7- External spaces & Security	7.1 (2)	2	2	1	2	1	2	1	2	1	1	1	1
	7.2 (5)	4	4	3	3	4	4	4	4	3	3	3	3
	7.3 (3)	3	3	2	2	2	3	2	2	2	1	2	1
8- Community Use out of hours	8.1 (10)	9	9	6	7	8	9	9	8	9	7	8	8
9- Robustness of Finishes	9.1 (5)	5	4	3	4	3	5	3	2	4	4	3	3
	9.2 (5)	4	3	2	3	2	5	2	3	2	3	1	3
10- Flexibility for future change	10.1 (5)	3	4	4	2	3	4	3	4	4	2	3	3
	10.2 (5)	4	3	4	4	2	3	3	3	4	4	2	3
TOTAL SCORE (PRE-WEIGHTING)	100	87	86	81	79	78	81	76	72	71	65	65	60

Table 4: showing POST-PRIMARY SCHOOLS achieved score by criteria breakdown. (*green denotes full marks in individual sub-category; red denotes a score of 50% or less*)

ASSESSMENT CRITERIA	BREAKDOWN (value /10)	Holy Cross College	Oakgrove College	Saintfield High	Bangor Academy
1- Clear Organisation	1.1 (4)	4	4	3	3
	1.2 (2)	1	2	1	1
	1.3 (4)	4	3	3	3
2- Well-Proportioned Spaces	2.1 (5)	5	5	4	4
	2.2 (5)	4	4	4	4
3- Generous Circulation	3.1 (5)	3	4	3	4
	3.2 (5)	4	3	4	4
4- Environmental Conditions	4.1 (4)	3	3	4	3
	4.2 (4)	4	3	3	4
	4.3 (2)	2	1	2	1
5- Design Quality comparison	5.1 (10)	8	8	8	7
6- Good Public Presence	6.1 (10)	8	9	8	8
7- External spaces & Security	7.1 (4)	4	4	4	3
	7.2 (6)	5	5	4	4
8- Community Use out of hours	8.1 (10)	7	7	8	7
9- Robustness of Finishes	9.1 (5)	3	4	4	3
	9.2 (5)	4	2	3	3
10- Flexibility for future change	10.1 (5)	4	3	3	3
	10.2 (5)	4	4	4	3
TOTAL SCORE (PRE-WEIGHTING)	100	81	78	77	72

Progress since 2004 Pathfinder's Report

The NIAO Report *"Building for the Future, A Review of the PFI Education Pathfinder Projects"* (2004 report) concluded that on technical and architectural quality some early PFI projects were considered below initial expectations. Project output specifications were failing to reflect basic school needs and performance requirements in regard to design standards. The 2004 report also established that PFI school procurement was linked to poorer design when directly compared with other traditional methods of procurement.

Through the process of this Design Quality Audit two PPP projects were audited. These were Holy Cross College in Strabane and Bangor Academy in Bangor. This section is to examine whether, with reference to the two above projects, progress had been made within the PFI procurement system since the report findings were published.

Each of following criteria was scored out of a potential of 10 marks. The individual reports with detailed analysis can be viewed elsewhere in this report, should further clarification or information on any issue be required.

Assessment Criteria Point 1 - Clear Organisation

In general, the 2004 report highlighted poor internal environments in all schools and lower design quality in the PFI schools, compared to non-PFI schools. Both Holy Cross College and Bangor Academy scored highly in clear organisation, with 9 and 7 respectively. Both schools equate well to wayfinding though simple measures such as signage and colour coding of internal finishes, although additional inclusion of coloured markers for orientation means could enhance Bangor Academy's score in this criteria.

It was agreed that the quality of internal and external layouts has progressed since the publication of the report.

Assessment Criteria Point 2 - Well Portioned Spaces

The 2004 report refers to the quality of traditionally procured schools having a significantly higher rating in architectural quality, of which space planning was one aspect. Both schools perform well within this category, with scores of 9 for Holy Cross College and 8 for Bangor Academy. Both schools are of significant size and adequate shape for their intended purposes and their plan layouts are well organised and functional. In general it was agreed that all spaces were well portioned and of correct size and shape, showing design quality and consideration in this regard has also progressed.

Assessment Criteria Point 3 - General Circulation

Within the 2004 report it was highlighted that corridor widths are generally too narrow and were poor in general design terms, both of which could lead to delays at class changeover time. This in turn would reduce available teaching time. Both Holy Cross College and Bangor Academy score reasonably, with 7 and 8 respectively. Circulation areas are generally wider than average in Bangor Academy, and Holy Cross College allows for good breakout spaces, with seating, for pupils to congregate. In general it was concluded that problems with general circulation are now being addressed, although some bottlenecks can still occur on occasion if care is not taken.

Assessment Criteria Point 4 - Environmental Conditions

It was highlighted within the 2004 report that some schemes suffer from poor acoustics, ventilation and indoor air quality. Levels of provided day-lighting was found to be much better in traditionally procured schemes. In our report Holy Cross College scored 9 and Bangor Academy 8. A number of issues such as day-lighting and natural ventilation have been improved upon. This is a positive step, as day-lighting can be key to the success of a school design and performance. Acoustic detailing would need to be developed further, to a point where external consultants would need to be involved to ensure spaces functioned as they need to. This is being addressed in some way by the need of PPP projects to now achieve BREEAM points which would require the use of an external acoustic specialist.

Assessment Criteria Point 5 - Design Quality Comparison

The 2004 report concluded that the design quality of schools has significant room for improvement. Holy Cross College scored 8 and Bangor Academy 7. Both schools have good design quality in detailing and specification and are equalivent to the detailing of the traditional schools audited. In general it was agreed that the concerns of the 2004 report are being rectified in more recent projects, as more emphasis has been placed on ensuring the new school buildings have an impressive public image and a commanding presence.

Assessment Criteria Point 6 - Good Public Presence

The 2004 report does refer to some good architectural examples, but also that there was less architectural input in PFI schemes. Holy Cross College and Bangor Academy both scored 8 in this criteria. As the below photos show both these schools have good public presence and quality facades. This would suggest that the concerns listed in the 2004 report are now being addressed.

Bangor Academy

Holy Cross College

Assessment Criteria Point 7 - External Spaces and Security

There are no specific issues in relation to assessment criteria point 7 in the 2004 report, although it does refer to that traditional build does offer more security. However Holy Cross College scores 9 and Bangor Academy 7, both schools have well designed external entrances. It is apparent in the design of Holy Cross College it gained "Secured by design" certification whilst Bangor Academy may not have fully addressed a number of security issues.

Assessment Criteria Point 8 - Community Use Out of Hours

There are no specific issues in relation to assessment criteria point 8 in the 2004 report. Both schools scored 7. The community usage issue conflicts with the PPP/PFI procurement structure and community usage is therefore limited to commercially viable uses. This is now addressed in the PPP/PFI process to some extent, but could be expanded to allow the end users greater flexibility in approach to the use of their building out of hours, if required.

Assessment Criteria Point 9 - Robustness of Finishes

The 2004 report found that most PFI colleges do not have the same detail design quality as their traditional counterparts. Poor specification and lack of attention to detail were identified. Holy Cross College scored 7 and Bangor Academy scored 6. In general finishes are adequate with the exception of paint specification which was considered poor in one instance. Underselling a finishing specification can be a false economy that will be no doubt be rectified by future PFI schemes under the workings of commercial decision-making, where capital cost is less prominent compared to the building's running and maintenance costs. The 2004 report refers to the lack of environmental sustainability within PFI schools. It was felt that sustainability issues should be higher on the agenda and explored more, although the commercial necessity of BREEAM compliance will again impact on this significantly.

Assessment Criteria Point 10 - Flexibility for Future Change

There are no specific issues in relation to assessment criteria point 10 in the 2004 report. Holy Cross College scored 8 whilst Bangor Academy scored 6. Holy Cross went some way to addressing this issue by having some dividing walls built in studwork, to allow for adaptability in future if deemed necessarily. Approaches to flexibility within the design of the school should be further investigated to allow for the future needs of a changing curriculum.

Conclusion

The 2004 report highlighted a number of general problems and successes within the PPP/PFI schools. Both Holy Cross College and Bangor Academy have been tested against the CABE assessment criteria points and it has been concluded that there had been significant improvements in relation to design quality. It is felt that assessment criteria points 8, 9 and 10 could be improved upon and that community usage, robustness of finishes (including sustainability), flexibility and adaptability should be further explored within PFI projects, as well as in schools built under traditional procurement methods.

General Comparative Points:

There are several areas of concern raised in almost every school visited. These are areas that we feel the Dept. of Education Schools Building Handbooks may be able to readdress in future updates.

Stores :

It is unfair to judge schools negatively for having the required scheduled area of storage, but it is also notable that this is one aspect of school design that is always questioned, and seems to have the greatest effect on the daily use of the building by the end users.

This is one accommodation requirement that is allocated a size in the Building Handbook (5 Sq M per classroom) yet the provision of stores, especially in primary schools, is never considered satisfactory. There are concerns that no given size would ultimately be satisfactory; and games, equipment and materials would grow to fill the available space. This is a valid concern, and it could be argued that a fixed limit of 5 Sq M helps to both keep the 'Limit of Internal Area' (LIA) of the school down and also focuses the mind of the teacher on what is truly valuable, enforcing a coherent discipline in approach.

One potential solution would be to have a greater allocation of centralised stores, to allow individual teachers to leave items that are not in regular use, freeing up valuable space within classroom stores.

Comms cabinet :

A dedicated room for a comms cabinet is again included in the scheduled area of a school, but the 5 Sq M is generally considered insufficient, especially for bigger schools where 2 or more cabinets are required. This can lead to comms cabinets being located elsewhere, usually within another store, where the space is then lost for its primary function. This relocation can also lead to other issues, in terms of a lack of ventilation provision and a risk of the space overheating as a result.

Ensuring the comms cabinet room is located on an external wall can also help deal with any arising overheating issues by allowing the option for natural ventilation in conjunction with mechanical extract.

Cloak areas :

Cloak areas are another example, like stores, where the under provision of area is most clearly evident to the end user. Due to the punctuated use and the level of belongings left in the spaces by pupils, the space ends up either looking very cluttered (when not in use) or extremely tight (when in use).

In general, as there is no minimum fixed area for this space, when the LIA is applied to the overall design, these are the spaces that get tightened up in order to help meet the required area.

Corridor widths:

This is another area that suffers from a tightening of its optimum size when area allocations are applied to the initial design. Wider corridors are known to make a building more appealing, more spacious, more functional and more welcoming, but it is not always practical to achieve this within the limits set by the accommodation schedule.

Minimum widths are now being applied to buildings through a change in Building Regulations and disability standards. This external authority guidance has helped ensure that corridors are not squeezed below a statutory minimum. Whilst this is certainly a step in the right direction, guidance in the Building Handbook specific to school buildings, dependant on school size, could also prove a positive response.

External play Spaces:

The proposed area of external play spaces is denoted in the Handbook and with regard to hard play, is generally adhered to. The suggested minimum grass play provision is rarely, if ever, achieved due to the nature and size of the available sites for schools. Schools are also generally reluctant to undertake the commitment to having the requested area of grass play, as they do not see it as 'value for money' due to the maintenance requirements and the limited time when the areas will be fully available and functional.

Mentioning the potential of seeking 'Secured by Design' certification in the Handbook could also be considered. This would be a positive step in all school designs even if only to undertake an initial consultation process, ensuring all relevant consultants are at least considering the best means of securing the building and its users from the outset.

Future Flexibility:

This is fast becoming a key aspect of any design. It is important to initially consider how the building can grow, taking care to allow for potential expansion with the siting of the building and the careful location of services. This is mentioned in the existing Handbook for consideration. Beyond this, the flexibility to adapt to a changing curriculum is also increasingly important. With proposals for amended age groups in currently established Key Stages, or a change in actual teaching methods, including smaller classes for more intimate work, or more open spaces for group activities, the modern school is required to be continually flexible. The future of educational provision is practically unknown with the advent of new technology and advanced teaching techniques, that any school facility built today needs to be able to respond to required changes, and in the least disruptive way possible.

A detailed note in the DE Handbook to ensure designers are properly considering the positive and negative aspects of certain construction choices, with regard to internal flexibility, could be a useful addition.

General overview of schools visited:

During our visits we have experienced a wide depth of approach in school design.

In general, we find the quality of school design improving steadily over the chosen survey sampling. Even within the narrow scope of the past ten years spanned by our design enquiry, we have noticed a small but steady improvement between the older and newer buildings included within the study. This is not to say the older schools were necessarily deficient, only that a discernible improvement was observed, which would be expected. The change in statutory requirements, the inclusion of more realistic budgets, of more knowledgeable and demanding clients & end users and the general raising of awareness of the intrinsic value of good design have all contributed to raising the bar on school projects in the past decade.

Role of DE Handbook in design quality:

In relation to the Department of Education Handbooks guidance on school design, it was agreed that all schools generally relate well to the guidance set down in the Handbook. The Handbook does give a general guidance to the development of the site, building, circulation space, play facilities, youth and community provision, future extensions, DDA, etc. It also sets down design advice on day-lighting and acoustics, although not in detail. In general it is up to the designers to use the Handbook as guidance to design quality; however it was felt by many end users that minimum standards pertaining to high quality design should be inserted within the Handbook. Our general opinion of the Handbook was that it needed to be reviewed in terms of space allocation with regard to the following; size of classrooms, stores, multi-use rooms, caretaker room, WCs and cloakroom facilities, changing facilities for primary schools, flexibility, photocopy/repro-graphics provision, comms rooms and an increase in principal/staff areas. It was also felt that more detailed descriptions in relation to day-lighting, ventilation and acoustics could aid designers in relation to ensuring a higher quality in their final design.

Role of end users:

One aspect of the construction process that was not considered at the outset, but has become apparent in its influence over the quality of the completed school, is the level of involvement offered to the school themselves. The energy and passion of an interested school body, acting as end user clients in conjunction with the design team, can really lift the final, completed quality of a project. The level of involvement and interest invested by the school seems to trump even the chosen procurement route in terms of offering a better, more rounded and viable design solution. An involved and engaged client is a key aspect in providing a design solution that is workable, attractive, practical, affordable and usable.