New from old: transforming secondary schools through refurbishment

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Kelmscott School, a London Borough of Waltham Forest BSF phase 1 school, refurbished by Architecture plb. Winner of 'Best design for a remodelled school' in Partnerships for Schools' 'Excellence in BSF awards', November 2008. Photo: Michael Jones

Introduction

Who is this advice for?

This guide is for anyone concerned with existing school buildings. It explains how to realise their potential, how to ensure you are doing enough and how to provide them – and your school – with a new lease of life. It will be of interest to local authority education teams, designers, heritage champions and local planning authorities. It is intended as a guide for secondary schools, but the information could also apply to primary schools.

Schools can play a pivotal and responsible role in developing and influencing ideas for the refurbishment of their school site, and can either control or contribute meaningfully to their detailed implementation.

Refurbishment projects tend to make up 50 per cent of a local authority's funding under the government's Building Schools for the Future (BSF) programme – so it's important that these huge sums of money are spent wisely, effectively and creatively.

This guide is for anyone concerned with existing school buildings. It explains how to realise their potential, how to ensure you are doing enough and how to provide them – and your school – with a new lease of life.

Background

People often assume that a refurbished, remodelled or extended building will automatically be inferior to a new one.

It's a surprising assumption when you consider the many excellent examples of buildings that are all the richer for having been built and then changed – perhaps a better term is *transformed* – intelligently and with all the care and attention that would be lavished on a new building.

Often these transformed buildings offer benefits that their new-build equivalents could never do.

Adapting an existing building can often generate a greater floor area for many schools. Indeed, it may sometimes be essential to have more space because of the particular arrangement of the existing building. The school community may be able to stay in place – or, if decanting is unavoidable, at least the school can return to a site they know and are established at.

Many buildings have qualities in their materials, special arrangement or construction – not always obvious or appreciated before they are transformed – that can be successfully exploited by refurbishment, adaptation or extension.

Given the embodied energy within an existing structure, and our increasing awareness of the urgent need to shift towards renewable resources, it is an obvious waste to discard structures just because they are old. ('Embodied energy' is a term used to describe the amount of the earth's resources that have been spent in creating something, for example the amount of raw material, excavation, heat, power and transport that have been used to make a building's steel frame.)

Sometimes – for example with a listed building or in a conservation area – legislation is in place to restrain us from 'wasting' or demolishing an existing building. Good architects find that the challenge of working with what's already there, rather than a blank canvas, often results in a more imaginative scheme.

There are, of course, many buildings that have provided poor teaching and learning environments for their schools since the day they were opened. Many were built during the mid-20th century boom in school provision. However, there are few of even these that cannot be comprehensively transformed to provide better schools and address the shortcomings of the original.

People often have low expectations when presented with the option of a refurbished, adapted or extended building. They will have witnessed the incremental changes through poor maintenance, repair or changes in legislation that gradually erode whatever positive qualities the original buildings may have had. Fire alarm systems are upgraded and ugly metal trunking is bolted to walls and ceilings. Buildings are repainted routinely and unimaginatively and original colour schemes are forgotten. Piecemeal extensions are constructed with inadequate budgets or forethought and with little consideration of how they integrate with the rest of the school. Clumsy ramps are added hastily to address access shortcomings but damage the appearance of the buildings and, as a result, the self-esteem of the school.

These unfortunate impacts are typically the result of short-term measures. An effective transformation of a building is the result of a holistic vision of the whole school site and a thorough analysis of the existing structures by those who know it best.

What is refurbishment?

What do we mean?

People use different terms to mean different things. **Refurbishment** means 'to furbish again' and 'furbish' is a centuries-old word defined in the dictionary as 'to restore to freshness of appearance or good condition' or 'to polish'. However, there is plenty of room for misunderstanding when people talk about doing work to an existing building and other terms have also come into vogue:

- **'refresh'** – means addressing the superficial aspects of a building such as decoration and finishes, and perhaps lighting, and some other minor works, without tackling deeper, more difficult (and probably more expensive) items such as heating, or structural alterations
- **'repair'** – means that something is broken and needs fixing. It could be cracked brickwork, faulty boilers or a leak in a flat roof – these are occasional events and will happen during the lifespan of any building and their likelihood can be reduced by good maintenance
- **'remodel'** – tends to mean a more comprehensive change in the character, use or quality of the building so that it ends up quite different, but uses much of the original structure and fabric
- **'re-use'** and **'recycle'** – both have gained currency as we have all become more used to the idea that we shouldn't waste things that still have life in them just because they have been used once, or are a bit tired. We recycle our bottles, bags and paper regularly and think that's a good thing – why not our buildings?

Sometimes the extent of change needs to be emphasised, and so '**radical refurbishment**' may describe extensive improvements that dramatically improve the quality of the building but don't necessarily change its essential character or use.

However, it is important to make sure that everyone connected with the project has a common understanding of what is being proposed and so it's better to use simple terms wherever possible. For example, if all that is required or on offer is a lick of paint, '**redecorate**' avoids any misunderstandings or disappointment. Avoid the temptation to be vague, otherwise decisions will be made without the benefit of being well informed.

And of course all of these terms are different from, but related to, '**maintenance**' or upkeep, which all buildings need to some extent throughout their lives however good or bad they are. If a building is reasonably well maintained throughout its life, it will usually have required a lot of repairs that may have been just short-term fixes. The quality of experience of those using the building will probably have gradually declined as a result.

A '**maintenance backlog**' is when money should have been spent in previous years stretching back a decade or two, but hasn't for whatever reason, and as a result there is much to do to put the building back into good order. Many schools have suffered in this way and their potential as successful, modern learning environments may have been masked.

Is refurbishment a second best option?

Absolutely not. There are many examples of buildings that were due to be replaced by a new scheme but were retained and transformed because of their special status and where retention can be seen to have been the better option.

Famous buildings like the British Museum and the Royal Festival Hall have been refurbished in the last few years. It would be difficult to argue that replacing them would have produced better results.

Aim high and take a fresh look

It's normal that as we get used to things we stop seeing them – unless we find them particularly irritating (like a door sticking or a noisy ventilation system). This happens with existing school buildings – we become so used to what we have around us that we may take it all for granted.

A fresh appraisal may come out of a focussed discussion with colleagues. A workshop, perhaps facilitated by someone who does not know the school, can identify a surprising range of strengths and valued qualities in the existing buildings that they may not bother to mention in normal conversation.

A new pair of eyes – particularly if they are trained to see in a certain way and are informed by a passion for making the best of a building – can identify the strengths and potential in buildings that on the surface may look tired, inefficient and redundant.

Stoke Newington School: Media Arts and Science College, Hackney, London
A glazed canopy allows pupils to wait under shelter, with integrated photovoltaic cells connected to the national grid. A meter display in the classroom shows levels of power generation.

Don't forget the outside

So many projects think the school stops at the outside walls. The school operates far beyond its boundaries and has profound effects on its surrounding community. Within the area over which it has complete control – the school site – there is likely to be a huge potential for making better use of the outside areas – the school grounds – and this needs to be an important part of seeing the school holistically, and of the school refurbishment project.

Imaginative external works can create a great deal of value for relatively little cost, particularly if integrated into a bigger refurbishment project.

Environmental sustainability

The sustainability of existing buildings needs to be considered as seriously as new ones. Given that most of our unnecessary energy use and excessive carbon emissions come from existing buildings, it is essential that we see the refurbishment of our existing building stock into more sustainable places as a high priority.

Re-using existing buildings is a form of recycling – you could see your project as a new building made up of a very high percentage of recycled material. Bear in mind that it makes sense to reduce the amount of energy that a building currently uses by turning off lights and equipment when not in use, before spending money on renewable energy.

Existing buildings may already offer potential benefits that can be realised through refurbishment. For example:

- If they have heavy structures, they will have a **high thermal mass**, which will slow down the rate at which they heat up and cool down. A refurbishment project can take advantage of this by increasing air flow and improving natural ventilation, perhaps by removing suspended ceilings to expose the concrete structure, or connecting openable windows to a building management system.
- **Solar gain** often has a huge impact on the school environment and students' ability to learn, but is also a source of free energy. Existing problems can usually be dealt with fairly economically by adding external shading, replacing glazing with a different kind of glass, and increasing insulation levels, particularly on flat roofs. Although photovoltaic cells are relatively expensive, they can be used in a limited way. Solar panels or tubes that help to heat water are much more justifiable in terms of future energy saving.
- If the scope of the project permits it, water consumption can be reduced by collecting and re-using – or **'harvesting'** – **rainwater**.
- Any or all of these ideas can be connected to **display panels** within the school so that their impact and effects can be monitored by all who use the buildings.

These are just a few relatively obvious suggestions. The opportunities and difficulties of achieving a more sustainable school estate will be special to your particular situation. Our ideas about sustainability and renewable energy are likely to change rapidly in coming years and we will all become much more skilled at sustainable refurbishment.

Shaping the project

A holistic approach

A local authority will need to consider all the schools in its estate through the use of a masterplan. This can be used to review educational transformation, estate management and links to other capital programmes and funding.

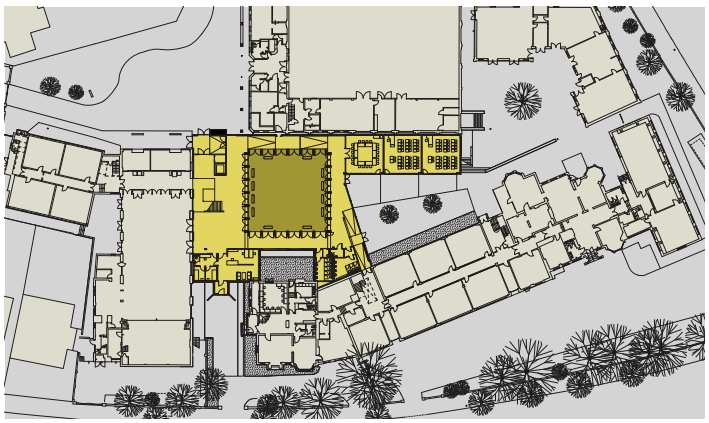
When considering a single school, the best refurbishment projects address the whole school site – even if only parts of it will be subject to major change. The least successful look at only bits of the school and don't take the trouble to understand how they will integrate with or affect the other parts.

A plan for the development of the whole school site – buildings and grounds – will identify what works well, what could be improved, what does not work and where there are future opportunities. A good development plan needs serious effort and enough time and should be based on effective consultation. It should allow the school to discover a different view of itself and to understand new opportunities while being realistic about weaknesses and limitations.

The development plan:

- should be able to identify small changes that won't cost very much but could make a big difference to the operation of the school – perhaps sorting out a problem corridor or changing the location of an entrance
- should allow you to optimise value – spend less and achieve more – because the whole school is being considered, not just the problem parts.
- may also allow you to consider how funding from more than one source can be used to best effect (but beware restrictions on mixing funding if you are part of the BSF programme).

Allow for the future – this probably won't be the last major project in the school's life – and consider what future opportunities you are creating (or preventing) by the strategy you adopt.



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St Benedict's School, Ealing, London
Drawing on this independent Catholic school's Benedictine heritage, Buschow Henley Architects designed the interior of the new building as a cloister, which frames the examination room and opens up to form the assembly space. This has realised the potential of the whole site, and reinforced the culture and identity of the school.

Doing things in the right order

It's better to try to do the big, dirty and disruptive stuff first – structure and infrastructure – and get the building watertight and weatherproof before the more delicate work of joinery, lighting and finishes is carried out. Otherwise you could waste money on protection and replacement which could be better spent on the permanent works.

It has been known for schools to be extensively and beautifully remodelled internally *and then* for roofs to be stripped off and replaced and windows to be changed – with obvious risks to the work that went before and a potential waste of money.

Sometimes there is no choice but to do things in a strange order. This may happen because funding comes from different sources and it may not be possible to have consents to spend money lined up in the right order.

The life cycle of a building

It's useful to understand how buildings change over time. Although new building projects always seem expensive, studies have shown that over 50 years in the life of a typical building the cost (in equivalent terms) of changes may add up to three times the initial cost.

There could be two or three generations of services replacements, for example, and perhaps as many as 10 significant changes in the way the building is arranged internally.

So change and transformation of buildings are an inevitable part of life and need to be done well. We need to understand the effect on long-term – life cycle or whole-life – costs, as well as the capital cost of each particular phase of change. The British Standard for life cycle costing is an in-depth guide to whole-life costs for construction. It can be purchased online at www.tinyurl.com/aq7s2f.

Stoke Newington School: Media Arts and Science College, Hackney, London
Three separate projects commissioned by The Learning Trust at different times, involving two practices – Gollifer Langston and Shepheard Epstein Hunter – have resulted in incremental refurbishment of a robust building from the 1970s with its own particular qualities. All were carried out while the school was in occupation. The reception project helped to create a contemporary welcome point for visitors, while remaining respectful of the original structure. The design technology department was remodelled to suit how the school wanted to teach: the space stripped back to structure, with security (and distraction) issues addressed by mesh screens with integrated glazing. Acoustic absorption was added to soffits, using recycled paper. Retractable power sockets attached to the ceiling and movable partitions allow for flexible seating arrangements to suit different teaching styles.

What should stay? What should go? When to replace?

Many of the decisions about the refurbishment project will come from the school's aspirations and requirements. But some of them will be clearly necessary and unavoidable, whatever else may happen, and there will be little choice but to allocate a significant portion of the budget to them.

For example, if the existing building contains certain health and safety risks, the project can be the means of addressing them once and for all: if the boiler plant is 20 to 30 years old or more, and has been unreliable, and perhaps uses parts no longer available; or asbestos is present; or the roof leaks; or the electrical wiring is old and needs renewing; or the structure dates from the 1950s and contains high alumina cement concrete (HACC).

In many cases a 'conditions survey' – an appraisal of all elements of the building and their condition – will probably already have been carried out by those responsible for the maintenance of the school. Sometimes these are comprehensive and seek to address all aspects of a school and its compliance with legislation and will include recommendations on asbestos, fire safety and means of escape and the Disability Discrimination Act (DDA).

The conditions survey is an important starting point for the project. If one is not already available, the design team will need to establish the current state of the building. They will probably recommend commissioning specialists to carry out particular surveys (such as an asbestos survey).

It may be necessary to research the original drawings and documents to understand how the building was designed in the first place (for example, the original construction drawings may indicate if the structure contains hazardous materials such as HACC). This is something structural engineers tend to do on most projects.

If the building you are dealing with has been completed or had significant work done to it since 1994, there should (by law) be a health and safety file available. This is a document designed to describe the scope of the work to those responsible for the building afterwards.

Possible surveys include:

- **geotechnical** – it is important to understand what is underground so that the requirements of foundations can be determined. A good geotechnical survey will include desktop research (looking at existing information and historical drawings) to assess the likelihood of contamination, the level of the water table beneath the ground and any likely obstructions, followed by on-site investigation, making deep bore holes and trial pits, taking samples and testing them in a laboratory
- **structure** – the type and scope of any structural survey needs to be determined by the structural engineer member of the design team
- **services above ground** – electrical and mechanical (heating, ventilation, water, plumbing, gas) services. It is essential to understand how the building works in terms of services to minimise the risk of disruption, to identify opportunities for energy saving and to be able to plan your refurbishment project around any major constraints that will be expensive to deal with. Whoever is responsible for managing the building will probably have drawings and information showing the likely location of services – but these often fail to keep pace with gradual changes over the lifetime of a building and there could have been significant changes made to services that can only be established through research and investigation on site
- **services below ground** – harder to detect, and there may be poor records of what has been installed. Desktop surveys and radio detection tools can help identify their location, or trial holes may be necessary
- **asbestos** – there are three types of survey, one to three, with three being the most intrusive (see www.hse.gov.uk/asbestos for more information)
- **noise and acoustics**
- **fire safety**
- **Disability Discrimination Act** – some shortcomings of a building may be obvious (such as poor access for people using wheelchairs) but it may be worth obtaining an independent comprehensive assessment from a specialist. See www.tinyurl.com/2vzd5j

Should I stay or should I go? Staying put or moving out

Each school will face its own difficulties during a refurbishment project. For some, moving some or all of their operations to another site may be the most effective way to achieve the objectives of the project. However, this may be impossible if there is nowhere available of the right size or quality to accommodate the school.

Sometimes schools are reluctant to leave their site because it will have a more negative impact on teaching and learning outcomes and attracting future students than if they stay and put up with difficult circumstances. Others may not be confident they will be able to return, for whatever reason.

Temporary accommodation may seem an obvious answer, but it will have implications on space, safety, budget and the experience of the students and their ability to learn. Money spent on temporary accommodation is likely to reduce the funds available for construction and therefore the scope of the refurbishment project.

A rigorous appraisal of the options at the early stages of the project, including an assessment of health and safety issues, is the only way to arrive at the best strategy. As with most of the issues discussed in this briefing, this provides an opportunity for consultation and for people to gain an understanding of complex issues and the difficult choices that may need to be made.

If the school is staying put, but releasing parts of the building for construction so that the works can be done in phases, careful thought needs to be given to the arrangement of the phasing and how each phase can be successfully delivered.

Beware the invisible services networks that link different phases together and ensure there are detailed thought-through plans to avoid disruption to light, power, heat, data and telephone cabling, gas and water.

Once the contractor is appointed, develop the phasing proposals with them – they may have useful insights into what is going to be easy or difficult. Consider how you will ensure that one phase is 'completed' – enough for you to use it – before the next phase is started. Your design team should be experienced in these issues and can advise on how best to achieve a good outcome, both in management and contractual terms.

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Cleeve School, Cheltenham, Gloucestershire
A whole site approach was adopted by Cube Design to improve this Gloucestershire County Council school. Some outdoor areas were covered over (top) to form new internal circulation spaces, with new lift and staircases. New extensions wrapping around the original structure provide a new face to the school (bottom). The model (centre) shows the new curved extension facing onto the road (with the new covered atrium behind).

Consents

Unless your refurbishment project is quite small and internal, it is likely that you will need planning consent. If your building is in a conservation area, you may need a separate conservation area consent, and if it is listed (recorded on the statutory lists of buildings of special architectural or historic interest) you will need listed building consent. Your local planning authority will be able to advise you on this and may also maintain a local list of buildings of special architectural or historic interest. Its website is likely to provide readily available information on these issues.

If your project needs any of these consents, you must not start construction until you have obtained them. This can be a lengthy and relatively expensive process and needs careful, skilled management. Usually this is led by the architect responsible for designing your project, supported by engineers and other members of the design team. Sometimes it is also wise to have a specialist planning consultant to help deal with particularly complex planning and legal issues.

As a general principle, forewarned is forearmed. A well managed project, with careful selection of design team, definition of project, liaison with the local planning authority and other stakeholders, and adequate time for thought and design, will stand a much better chance of gaining planning consent than one that has been hastily prepared.

Building projects almost always need approval under building regulations. This is something your design team will deal with. Again, adequate time needs to be allowed for detailed design and liaison with the officers or approved inspectors responsible for granting consent.

For an overview of the planning and building control processes see the planning portal (www.planningportal.gov.uk). You may need other consents in relation to your neighbours, to do with party walls and rights of light. Your advisors and design team should be able to identify these.

Knowing where and when to stop

Building projects usually involve a degree of compromise and accepting that not everything can be dealt with in one go. Deciding what to prioritise will be a fine judgement and one that you may not be able to make until you have a design team in place and have done quite a lot of analysis.

It's important to consider what the transformed and 'untouched' parts of the school will be like after your project has been completed if it's not possible to achieve everything. The parts that look acceptable now will probably look more tired and dated if they are next to the newly transformed elements unless they have a special or historic quality. It may therefore be worth considering 'grading out' the appearance of refurbishment so that the transition in the appearance of the building from new to old is more gradual.

As part of the early stages of the project – defining what the project is about and carrying out a school development plan – there needs to be a clear understanding of when additional funding may be possible in the future, what legacy of repair, refurbishment and maintenance will remain, and how this will be paid for and by whom. This will affect how you define the scope of your refurbishment project.

Who? What? When?

Who needs to be involved?

A good refurbishment project will be based on thorough and well-led consultation. The school needs to tap the potential of the people within the school without wasting their time or raising expectations that cannot be fulfilled. The headteacher and senior management team need to commit to communicating the objectives of the project and listening to people's views.

Visiting other successful refurbishment projects (not necessarily schools) will inform and inspire your own project.

A school refurbishment project will require a project team including some or all of the following:

- architect*
- environmental engineer (mechanical and electrical services)*
- landscape architect*
- structural engineer*
- acoustic consultant*
- other specialist advisors
- cost consultant or quantity surveyor
- client design advisor
- CDM (construction design and management regulations) coordinator
- contractor (and its sub-contractors).

Under some forms of procurement (typically, under BSF) the contractor may be responsible for the design and will employ the designers (*above) in addition to being responsible for the construction of the project.

However, under methods of procurement where the school is responsible for the project, it will probably employ the design team directly first. The team will prepare the design for the project before selecting a contractor on the school's behalf.

You may wish to involve an experienced project manager to help manage the project.

Consultation

Consultation is just as important on a refurbishment project as on a new-build scheme. It will give the chance for people to 'buy in' to what is being undertaken, to understand the improvements – and limitations – and 'put up' with or reconcile themselves to situations that are less than perfect, both during and after construction.

The design quality indicators (DQI) for schools process enables conversations between stakeholders about the design process, supported by the DQI facilitator. It is a mandatory process in BSF. See www.dqi.org.uk/schools for more information.

Part of the curriculum

A construction project can offer good material for students to gain an insight into a whole range of subjects, from management to plumbing, architecture to energy and the future of the planet.

Usually the design team and contractor will be only too willing to make presentations and help make the project interesting and a positive experience. However, teachers and the management team may find this requires significant effort to deliver successfully.

Charter School, Southwark, London
Phased refurbishment of a 1950s London County Council school over four years by Penoyre and Prasad. Included new cladding to the elevations of glass, louvres and coloured aluminium. This helped improve the school's identity.

How to realise the potential of the site and buildings

The school needs to have a clear vision of how it wants to operate in the future, as well as a thorough understanding of how it works now and the constraints and opportunities offered by its buildings and site. How do people approach the school? Do they feel welcome? Are they impressed? If not, why not?

When users are asked what they want from their building in future, they often seek to replicate what they already do rather than thinking how they could transform what they do by organising the building in a different way.

A substantial refurbishment project can be used to enable a proposed change in a school's organisation or curriculum. It could also enhance changes that have already been put in place.

One of the best ways to establish the most effective transformation of the site and buildings is to consider options at an early stage and appraise them objectively. This options appraisal process consists of looking at all the different ways that your overall objectives could be met without pre-judging them and then assessing them against a set of carefully considered criteria, perhaps using a scoring mechanism. This should allow you to be more objective about the way forward and it may be that your final choice is a hybrid of two or three of the options.

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Scope: how to spend money wisely

Matching aspirations to available funds will be difficult. Having built up expectations during the early stages, it can sometimes seem discouraging that there are not unlimited funds with which to realise the vision.

However, it is important to be tenacious and for the team to work constructively together to ensure that the best value is squeezed out of whatever money is available. Some tips to help this process are:

- record clearly and in simple unequivocal language what the school seeks to achieve
- ensure that the school's requirements are prioritised into 'core' objectives (essential things without which the project will be a failure), 'nice to haves' (desirable but the school can function without them) and 'bonus' elements (which will allow the school to do more but could perhaps be added later or funded separately)
- ensure that whoever is monitoring and reporting the costs of the project is able to explain clearly why things cost what they do and how cost estimates have been prepared. The school can then understand the impact of decisions and suggest ways in which their objectives can be achieved with less cost
- understand that providing cost advice at the early stages of a project can only ever be an approximate process and that final costs may change.

The elements that usually cost most are:

- structural change, for example load-bearing walls
- renewal or change of services infrastructure (for example, changing the location of boilers or gas mains) or replacing equipment
- temporary works – building works necessary only to hold something up while the permanent work is being carried out, or to protect the school from health and safety risks or to divert and maintain services.

By considering a number of different options for refurbishment – and then appraising them – the school will be able to understand the effect of different decisions and make informed choices. An options appraisal is a recognised way of understanding different routes to a solution and choosing the most effective one.

Deciding on the right budget

The budget may have already been determined. For example, your school may be one of many in a programme of change across a large local education authority. Someone at some time will have had to allocate a sum of money to your school for works that may have only been approximately defined at the time. Bigger, more controversial projects may have been given much more attention. Local authorities will have to prioritise across the schools in their estate.

If you are starting out on a project with an idea of what needs to be done, but no idea of how much it is likely to cost, it is useful to understand the stages that projects typically go through as they progress from first ideas to detailed plans, construction and beyond. The Royal Institute of British Architects (RIBA) plan of work is a guide to how projects can usefully be broken up into work stages so that briefing and design can be efficient and avoid abortive work and misunderstandings (see www.architecture.com). CABE's client guide *Creating excellent buildings* splits the steps of a building project into four main stages: prepare, construct, design and use. *Creating excellent secondary schools* is a step-by-step guide to school building projects.

At each work stage there should be an assessment of cost. Decisions can then flow from that about whether there are sufficient funds allocated, whether the scope of the project needs to be reduced to meet the available funds or a mixture of both. This can often be a time-consuming process but it is most productive when cost problems are shared and dealt with by the whole team so that the issues can be properly explored. A good design team will respond imaginatively to cost problems.

The term '**value engineering**' will probably be used at some point in the design or construction process. This is not necessarily another term for cost cutting – the point is to ensure that you get the best value from the resources available to you. Value engineering is basically a process of testing and investigation which may result in more money being allocated in some areas of the project to ensure, for example, the right quality of building or to reduce the level of maintenance or replacement costs needed after the project is complete.

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Mulberry School for Girls, Tower Hamlets, London
This London Borough of Tower Hamlets school refurbished its school grounds by creating a series of landscaped courtyards to encourage outdoor circulation, external teaching, play, socialising, learning and sports.

RIBA work stages

Prepare
A Appraisal
B Design brief

Design
C Concept
D Design development
E Technical design

Pre-construction
F Production information
  F1 information sufficient for tenders to be obtained
  F2 additional information required under the building contract
G Tender documentation (including bill of quantities)
H Tender action: obtain and evaluate tenders

Construct
J Mobilisation: letting the building contract
K Construction to practical completion

Use
L Post practical completion
  L1 administration of the building contract after practical completion and final inspections
  L2 assisting the building user during initial occupation
  L3 review of project performance in use

Checklists

Making the most of your budget

A good principle is that if a project is worth doing, it's worth doing well. It's too easy for people to be too optimistic or pessimistic about what can be achieved with a certain budget. Here are some tips:

- **Be clear about what 'design life' you want for the projec**t – how long you can expect the completed works to last before major works are required again. This is usually about 50 to 100 years (or more) for elements of the structure, 20 to 25 years for new windows, roofs and mechanical and electrical services (but they will still need maintenance during that period), and shorter periods for items that are subject to a lot of use and operation (for example, door closers and reception desks). Decoration of painted surfaces will be necessary at shorter intervals, usually every five to 10 years. In some circumstances (such as where leases are due to run out) buildings can have much shorter design lives.
- **'Benchmark' your project** – if possible, find a completed project elsewhere that comes close to your vision of what you are seeking and use that as an illustration. Try to find out what it cost (this is often very difficult so make sure any figures you obtain are truly comparable) and use that as a comparison with the cost plan for your project. This is a great learning opportunity: it may give you access to people who have gone through this process before and can tell you what worked and what didn't and it could be one of the best investments of time you make in the whole project. Take colleagues and stakeholders with you – shared impressions and analysis can be hugely useful and revealing.
- **Challenge what you are being told in a constructive way** – until you find it convincing and are satisfied that you understand it. Not all professionals communicate effectively, and you may have to ask particular questions to get the answers you are seeking.
- **Be clear about the level of quality you need** in key areas but be prepared to compromise in areas that are less important.
- **Ask for simple models and competent illustrations** of what is proposed so you can understand what it will be like in the completed project. Pace out particular spaces so you can understand how big they will be – a stride is usually slightly less than one metre.
- **Ensure that people are using the same terms** and have a common understanding of what is proposed (see page 4 *What do we mean?*).

Don't deny the past

Your building may be highly valued, well looked after and generally loved. However, if it has suffered quite badly in the last few decades, be prepared to try to see what qualities the original building may have had before it went through piecemeal alterations, poor decoration, inadequate maintenance, DDA upgrades and mechanical and electrical services changes. Bear in mind that the team that conceived the original building may have had a very different view of the world but that doesn't mean they didn't have high aspirations for how their building would enhance people's lives.

Play to the strengths of your building. Work with your design team to understand what value lies in the existing building and how the original fabric can be integrated with your new project. If your building is listed (see page 10 *Consents*) you will have to do this anyway, but it is an approach that will benefit most refurbishments of existing buildings, not just the specially protected ones. Examples from other projects include:

- leaving brick walls exposed if they become internal where you are adding an extension
- taking off suspended ceilings to reveal original structure and soffits
- uncovering original features which have some historic or curriculum value.

In other words, don't just cover everything up with 'new' just because you think 'new' must be better than 'old'. You should be aiming for quality that endures and a building with an interesting history.

Attention to detail

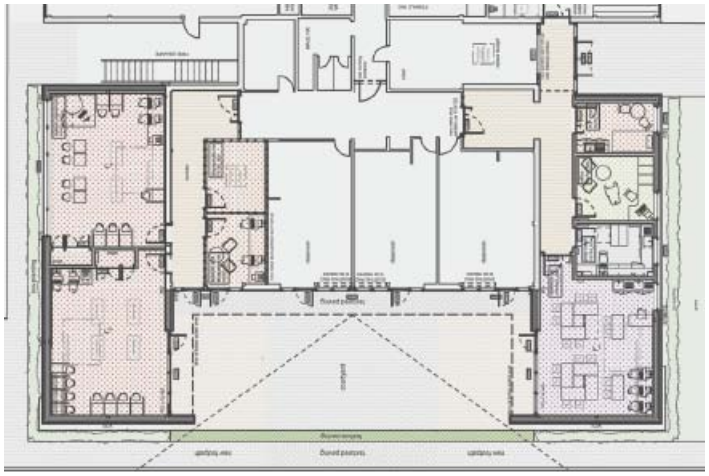
Good designers should be able to get as excited about a refurbishment project as a new building. The joy of a transformation is often derived from junctions – such as the way new meets old – how old materials can be re-used and given new life, and the experience of passing from an 'old' space to a 'new' space.

Services – don't take your eye off them

Electrical and mechanical systems, drainage, plumbing, gas, water and electricity supplies and data cabling can typically account for 20 to 40 per cent of the budget of your project. They deserve serious attention to make sure money is spent wisely and problems are ironed out early.

Services are also the source of much dissatisfaction in finished buildings (with complaints such as 'too hot in summer, too cold in winter'), delays and cost problems during the construction process, and health and safety risks and hazards (such as asbestos lagging left under pipe clips where all around it may have been removed). And they obviously make a huge difference to how much energy your school consumes and the amount of carbon it emits.

It's essential to make sure that the existing services are thoroughly understood before you start construction and that you have properly competent – and hopefully imaginative – designers and advisors dealing with your services issues. Make sure you devote enough time and attention to understanding the services proposals and quizzing your team.



Baycroft School, Fareham, Hampshire
A secondary school for pupils with special educational needs, extended and refurbished by Hampshire County Council Architecture and Design Services, to provide a new unit for those with autistic spectrum disorders. The new building wraps around the older building to form a courtyard shielded from a busy road with windows at right angles to the noise source. The previously vulnerable and exposed southern elevation has been re-faced to make a new front to a dilapidated system building, plus internal alterations. New rooflights bring daylight to the interior.

Hazards – health and safety

It is important to pay proper attention to the effective management of health and safety issues. There are established procedures in place and legislation that will control the way your project is managed and the documents that you and your team will need to produce during the course of it. The essence of the law is that those responsible for initiating the project are ultimately responsible for managing health and safety risks in accordance with best practice. Your design team, construction design and management (CDM) coordinator and other health and safety advisors will help you with this.

The particular hazards and risks that come with refurbishment projects usually arise from not knowing enough. It is very difficult to say exactly what is contained within the structure and fabric of your building until you open it up – and this may not be possible until the construction stage.

One way to reduce this risk is to carry out an investigative or 'enabling' contract before the main contract which strips out, opens up or explores certain aspects of the building and helps you and your team understand and deal with any problems before you commit to an expensive construction contract.

Risks – time, money and quality

Apart from health and safety, the main impact of changes, discoveries or inadequate specification will be on time (delay), money (overspending) and quality (inadequacy or disappointment).

The more prepared your team is, the less risk there is to the construction contract, but it is never possible to eliminate risk completely.

It is important to have contingency funding and plans in place in case the worst happens. These should be part of the project and discussed and evolved with your design team.

Be realistic about risk. Even very experienced building professionals know that every construction contract is unique. Something will happen that cannot be fully predicted and the project needs to have enough of a contingency sum to prevent this having serious consequences for the school.

This is particularly true for a refurbishment project because it is almost impossible to isolate the new works from the old and because they are often carried out in parts of the school while other parts are occupied.

Select a good contractor that has the necessary experience and a constructive attitude, and maintain good regular contact and effective communication with them throughout the construction process. This will help both sides understand each other's concerns, identify difficulties in advance and deal with them before they become problems.

Conclusions

Principles for success

There are many different ways of designing and procuring refurbishment projects, but successful ones will:

- have a clear understanding of roles and responsibilities
- develop a programme (timescale) at the beginning, and make sure it is used effectively
- learn from other successful projects
- ensure everyone concerned has a common understanding of the terms they are using, the scope of the project and its constraints
- adopt a holistic approach and if possible prepare a school development plan first
- understand your existing situation thoroughly and carry out advance enabling or investigative works if possible
- manage costs creatively
- employ a good design team and use them effectively
- commit to sustainability.

Don't forget to celebrate

As you will have gathered from what has gone before, a great deal of work is involved in a successful refurbishment project – more than you can usually see, rather like an iceberg.

It's important to be positive, constructive and make sure the team works well together, especially through the difficult times.

If you've done your homework, the end result will be worth it. Don't forget to celebrate.

Useful references

- *Creating excellent secondary schools: a guide for clients*, CABE, 2007.
- *Creating excellent buildings*, CABE, 2003.
- *How buildings learn: what happens after they're built*, Stewart Brand, Penguin, 1995.
- *Schools for the future: transforming schools*, DfES 1140-2004.

If you've done your homework, the end result will be worth it. Don't forget to celebrate.

Why do so many people assume that new schools will be superior to refurbished ones? Many buildings have been transformed to provide benefits that could never be achieved through new build. Refurbishment projects are a significant part of both Building Schools for the Future and the Primary Capital Programme. This briefing explains how to realise the potential of your buildings and give them – and your school – a new lease of life.

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