COST MODEL PRIMARY SCHOOLS

After much delay the government has now launched the private finance element of its school building programme. **Darren Talbot** and **Stuart Francis** of **Davis Langdon, an Aecom company** and **Simon Cash** of **Artelia UK** focus on the primary school sector and its build costs

01 / INTRODUCTION

The Education Funding Agency has recently released the first batches of the £1.75bn privately financed schools programme, although the privately financed element has shrunk to £700m. In addition to this, the government did announce in May new capital funding of £300m.

Regardless of how these schools are funded, they will be released to the market in batches, with the first OJEU for the £122m Hertfordshire, Luton and Reading batch of seven schools due in June. Each of the geographically located batches will comprise a mixture of secondary and primary schools.

Then ... Primary Capital Programme

During the days of the Building Schools for the Future (BSF) programme, primary schools were treated as the poor cousin to their more profitable and architecturally interesting secondary school relations. The £1.1bn Primary Capital Programme bore little relation to the more glamorous £55bn BSF programme, was in some cases rolled up into the BSF LEP, then quietly drifted away under the coalition government, its passing barely noticed behind the hubbub surrounding the cancellation of the BSF programme.

The stated aims of the Primary Capital Programme were to make additional funding available to enable local authorities to rebuild or take out of use the worst 5% of primary school buildings and to significantly improve at least half of all primary schools. Local authorities were encouraged to take a strategic approach to rebuilding, refurbishing or remodelling their primary schools to bring them up to 21st-century standards.

And now ... Baseline designs

The Education Funding Agency has developed a series of "baseline designs". In total there are 14 baseline designs, six of them being primary schools. These range from a 105-place school with a 26 place nursery, through to a two-storey 630-place primary school. In the face of significant criticism from architects and educationalists among others, the Education Funding Agency has been at pains to state that baseline designs are purely illustrative of how the reduced space standards could be configured, and that it is up to individual design teams and contractors to develop their own designs.

Hayhurst and Co Architects extended Hayes Primary School in Croydon to accomodate four new classrooms, an ICT suite and administration facilities as well as outside play areas

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The future

With the seemingly unending increase in birthrates, it is time that Primary schools move beyond the sticking plaster approach of portacabins and are instead provided with permanent, flexible, fit for purpose facilities that schools and pupils are proud of.

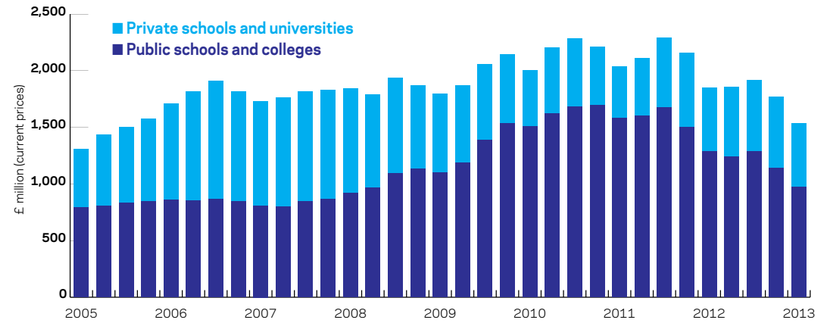
02 / EDUCATION CONSTRUCTION MARKET

The chart (right) shows the sharp increase in public funded schools work that occurred in 2009 and 2010 as the previous government pumped money into public sector building work to boost the economy. It also shows the equally sharp fall in activity that has characterised the sector since the end of 2011. Nevertheless, at the beginning of 2013, the amount being spent on publicly funded schools and colleges was still higher than all the years prior to 2008, despite the drop in prices that the industry has experienced since then.

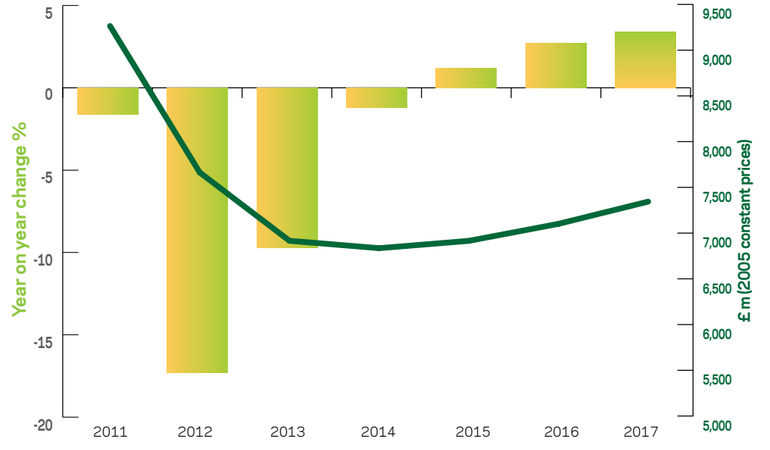
It also shows that the height of privately funded education construction was 2006-8 when over £900m per quarter was being spent on schools and universities; since 2010 this figure has stabilised at a little under £600m per quarter.

The Spring 2013 Construction Industry Forecasts from the Construction Products Association (right) expects the trend of the last two years to continue. Following a 17% reduction (in constant price terms) in 2012, education construction activity in 2013 is expected to fall a further 10% before stabilising and showing minor growth in 2016-17.

Construction output



Construction Products Association forecast



03 / DESIGN ASPIRATIONS

The main design issues currently being addressed for schools in general (both primary and secondary) are to adapt to the new Priority School Building Programme OutputSpecification published by the Education Funding Agency, which is essentially replacing Building Bulletins previously used as guidance for school design, in particular acoustics and environmental design. The major driver is to provide naturally cross-ventilated energy efficient teaching spaces which perform acoustically with good natural daylighting.

Many contractor framework bidders have developed an affordable "kit of parts" approach to structural frame and building service provision which allows for flexible adaptation on individual sites that can be tailored for specific teaching pedagogies.

The "kit of parts" approach, often using standardised off-site manufactured components, allows spatial layouts for individual schools to follow the Baseline Design templates being published by the EFA (the latest batch of which have recently been published).

With the new PF2 procurement about to get under way, another layer of design criteria, including energy in use monitoring, with penalties imposed for buildings that exceed set targets, are also focusing the minds of environmental consultants. Only time will tell whether building to these new standards will be more successful than those that went before. »

04 / PROCUREMENT ISSUES

» With the serious shortfall in pupil places in so many regions around the country, the provision of temporary classrooms on a short to medium-term basis is no longer seen as a viable solution, *writes Simon Cash*.

Using their own and central government funds, local authorities are looking to new-build projects to provide a permanent and future-proofed response.

Given the pressure on funding, the key to a successful project is a clear brief and design that, when tested, is seen to be affordable and can be delivered to the desired programme. The link between the two is procurement. Without the right procurement route and robust procurement documents, it is easy for ambiguities, contradictions and loopholes to creep in that could lead to escalation of costs, delays and ultimately disputes. There are many issues that arise through the procurement process. So, what are the challenges?

■ **Options appraisals** Even before a project is confirmed, options appraisals have to be carried out to establish which sites can be developed, or which existing schools are best suited for expansion. Due to the limited funds that local authorities have, these appraisals are often carried out using limited information, relying on assumptions.

With the appraisals over, new design teams are procured to develop the feasibility into a scheme that can be used to procure contractors. However, no two designers will have the same approach to developing solutions and the new team will invariably look at yet another alternative, taking the scheme back to first principles again. Both the procurement of a new design team and revisiting options uses valuable time in what is, more often than not, a tight programme.

Engaging designers to develop options appraisals, but with a break clause in the event that the scheme is not taken forward would save considerable time, which can be used to benefit the project elsewhere. Of course, continuity of design team avoids the need for taking a backward step when good work has already been carried out.

■ **Assumptions** Further challenges arise from basing options appraisals on assumptions, when schemes are taken forward, surveys and investigations are carried out, or planners are consulted. The resulting information and feedback may throw up problems that would have led to an alternative solution had they been known at the time.

The impact is a squeeze on both costs and designs, to make sure the project works. This often also leads to a squeeze on the brief, which dilutes the school's expectations of what they are getting from the project and leads to a testing relationship between school, local authority and consultant. Therefore, it would be better to put more value and effort into the options appraisals to better inform the viability of the scheme, which will facilitate development of the design and selection of a robust procurement strategy further down the line.

■ **Risk** Being risk averse, local authorities look to transfer as much risk to the contractor as possible. From the contractor's point of view, they need to be able to quantify that risk, to allow them to make due allowance for whatever they have to assume responsibility. So, a more equitable way of approaching this thorny subject is to draw up a risk transfer schedule that identifies all the known risks and what information is available to the tenderers to allow then to make an informed decision on the commercial offer they make. Where it is considered that the information available is insufficient to evaluate the risk, the suggestion should be that the risk remains on the client side and put into the risk register. This will then inform the level of contingency that needs to be held out of the overall budget.

■ **Design and build** The decision whether to follow a traditional or design-and-build route will often be dictated by programme needs or the desire to transfer risk to the contractor. The problem that contractors find with design and build is that many schemes are being taken to a level of design that does not give them the flexibility of applying their expertise in detailing designs to add value to the project. Where schemes are taken through to RIBA stage E or F, the level of detail is virtually to the standard of a traditionally procured project. On the other hand, where designs are tendered at RIBA stage C or D, the Employer's Requirements do not adequately detail those aspects of the brief or design that are non-negotiable. This can lead to tensions between designers and contractors, with contractors' proposals being rejected and arguments as to what the contractor should or should not be providing.

One way to strike a balance is to establish a schedule of non-negotiables as part of the briefing process and as the design develops. This schedule then forms part of the Employer's Requirements and, where appropriate, the design is taken to a level of detail that allows the design team to be prescriptive. For other elements of the scheme the design is only taken to a level that will allow the contractor the ability to offer best value, without compromising the overall project and brief.

■ **Data sheets** In addition to the above, the development of detailed room data sheets for accommodation can go a long way to conveying the brief and are an easy reference document that all can refer to in the event that there is a question over the provisions within a specific space.

■ **Preparation time** Invariably, school expansion projects need to be delivered by the start of the new academic year. This means that there can be several projects running in parallel, with tight timescales. Developing a realistic programme that everyone signs up to is a challenge, and the area that most often gets squeezed is the procurement of the contractor. However, in reality this is the time that will have the most critical bearing on the outcome of the project. Inadequate time for preparation and proper review of tender documents, short tender periods, insufficient time given to evaluate tenders, and a lack of appreciation of the time the local authorities' decision making process takes, all result in contracts being awarded late against programmes.

This puts pressure on the construction phase and the contractor ends up taking on the risk for fear of losing the contract. A well-considered procurement programme that gives time to properly review documentation will highlight any weaknesses that can be addressed prior to getting into contract.

Simon Cash is director of cost management at Artelia UK

05 / COST MODEL

	Total (£)	£/m²	
Substructure	**875,000**	**218.75**	**14.6%**
Site preparation, 4,000m² @ £5			
C20 strip footings, 1,700m @ £150			
300mm ground bearing slab, 4,000m² @ £110			
Underground drainage, 4,000m² @ £20			
Sundry items; Tanking/DPM; Movement Joints, 4,000m² @ £20			
Frame and upper floors	**216,000**	**54.00**	**3.6%**
Structural steel frame, 100t @ £1,600			
Fittings, 10t @ £1,600			
60 minute intumescent fire protection to exposed steelwork - on site application, 1 item @ £30,000			
Allowance for bracing and trimming steels incl. fire protection, 1 item @ £10,000			
Roof	**648,000**	**162.00**	**10.8%**
Standing seam joints composite insulated pitched roofing system; 80mm overall panel thickness (U-value = 0.13); incl. beads and angles, 4,817m² @ £120			
Canopies to walkways, 1 item @ £25,000			
Sundry items; mansafe system; rainwater goods, 1 item @ £45,000			
Stairs	**9,000**	**2.25**	**0.2%**
Precast concrete stair to level change; 2nr half flights @ £4,250			
Steel handrails to wall, 5m @ £95			
External walls	**464,800**	**116.20**	**7.8%**
Self coloured render on single skin block wall; plaster board dry lining, 1,868m² @ £175			
Thermoboard cladding with breather membrane on single skin block wall, 403m² @ £225			
Facing brick on single skin block wall to base of building, 173m² @ £160			
Brise soliel, 78m² @ £250			
Windows and external doors	**207,900**	**51.98**	**3.5%**
E.O Aluminium PPC windows, double glazed, manual openings, 412m² @ £260			
Double leaf glazed main entrance doors (manual), 19nr @ £4,200			
Double leave service entrance doors, 2nr @ £2,600			
One and a half leaf doors, 3nr @ £2,100			
Single leaf doors, 6nr @ £1,575			
Internal walls and partitions	**339,400**	**84.85**	**5.7%**
Metal stud partitions; generally 2 layers of plasterboard each side; various levels of fire and sound insulations, 3,347m² @ £60			
E.O. allowance for glazed timber walls (vision panels alongside classroom doors) (assumed 10%), 335m² @ £230			
Cubicle partitions with doors, 62nr @ £750			
Fire protection between partitions and roof 1 item @ £15,000			
Internal doors	**151,200**	**37.80**	**2.5%**
Single leaf doors 87nr @ £675			
Double leaf doors 26nr @ £1,250			
E.O vision panels, acoustic treatment, fire rating 1 item @ £50,000			
Reception hatches and roller shutter @ £10,000			
Wall finishes	**90,700**	**22.68**	**1.5%**
Skim and paint generally, 8,130m² @ £8			
Full height hygenic wall lining system to kitchen areas, 338m² @ £45			
Ceramic wall tiling to WCs, 1 item @ £10,000			
Paint to plant and storage areas, 94m² @ £5			
Floor finishes	**279,800**	**69.95**	**4.7%**
Concrete screed and insulation, 3,882m² @ £26			
Heavy duty carpet tiles to classrooms and circulation areas, 3,104m² @ £34			
Vinyl sheet flooring to kitchen area and WCs, 383m² @ £26			
Junkers sports flooring to hall, 320m² @ £72			
Matting,1 item @ £15,000			
Dust sealant finish to plant and storage rooms, 75m² @ £5			
Skirtings, 1 item @ £25,000			
Ceiling finishes	**177,800**	**44.45**	**3.0%**
Mineral fibre suspended ceilings; incl. Linings, 3,424m² @ £46			
Moisture resistant ceilings to WCs, Kitchen, 383m² @ £52			
Emulsion painted soffit to plant and storage rooms, 75m² @ £5			
Bulkheads and casings to voids and high level rooflights, excl.			
Furniture and fittings	**180,000**	**45.00**	**3.0%**
Kitchen fit-out, 1 item @ £100,000			
General Fixed FFE, 4,000m² @ £20			
Sanitary appliances	**107,900**	**26.98**	**1.8%**
WC's, 48nr @ £350			
Wash hand basin, 30nr @ £250			
WC suites, 8nr @ £1,800			
Disabled WC, 6nr @ £2,200			

A typical low cost school

The featured school is a typical example of the new "low cost" family of schools, and is loosely based on the Education Funding Agency's baseline design for a 630 place primary school with nursery spaces over 4000m² gross floor area. It is constructed on a greenfield site, and is formed by a structural steel frame to maximise future flexibility and adaptability, shrouded with a thermally insulated and rendered block wall. Internally it consists of skimmed and painted double layer plasterboard partition walls, with tiled finished to WC areas. Flooring is concrete screed, with a finish of tiles, carpets and sports flooring. Underfloor heating is supplied through a high efficiency gas fired boiler. BREEAM rating is "excellent". The cost model does not include external works or abnormal costs, as these will be site dependent. The construction period will be in the order of 56 weeks.

The cost model is based on a location in the South-east of England. Cost variances do exist in other parts of the country and the following table provides indicative multiplying factors that may be applied to the costs in the model to derive costs applicable to other locations.

Location factors	
East Anglia	0.99
East Midlands	0.92
Greater London	1.02
North-west	0.88
Northern Ireland	0.68
Northern	0.88
Scotland	0.91
South-east	1.00
South-west	0.96
Wales	0.91
West Midlands	0.93
Yorkshire and Humberside	0.93

	Total (£)	£/m²	
Cleaners sink, 3nr @ £500			
Vanity units, 10nr @ £2,100			
Hand driers; approximate quantity, 20nr @ £425			
Mirrors and WC fixtures,1 item @ £25,000			
Disposal installation	**64,000**	**16.00**	**1.1%**
Disposal installations; soil waste and disposal, rainwater disposal, 4,000m² @ £16			
Water installation	**116,000**	**29.00**	**1.9%**
Water installations; hot and cold water service, storage, distribution, 4,000m² @ £21			
Miscellaneous water services to plant etc. 4,000m² @ £8			
Heat source	**52,000**	**13.00**	**0.9%**
Gas fired boiler, 4,000m² @ £13			
Space heating and air treatment	**114,200**	**28.55**	**1.9%**
Low temperature hot water heating distribution, 457m² @ £25			
Underfloor heating, 3,543m² @ £29			
Ventilation installations	**116,000**	**29.00**	**1.9%**
Server room cooling, 4,000m² @ £5			
ICT room cooling, 4,000m² @ £9			
Kitchen extract ventilation, 4,000m² @ £4			
Toilet extract ventilation, 4,000m² @ £6			
Miscellaneous ventilation/cooling systems, 4,000m² @£5			
Electrical installations	**392,000**	**98.00**	**6.5%**
LV supply/distribution, 4,000m² @ £50			
General lighting, 4,000m² @ £30			
General power, 4,000m² @ £7			
Electrical services in connection with mechanical, 4,000m² @ £5			
Disabled WC alarm, 4,000m² @ £1			
Data and voice, 4,000m² @ £5			
Gas installation	**21,000**	**5.25**	**0.4%**
Gas service to boilers, 4,000m² @ £4			
Gas service to kitchens, 1 item @ £5,000			
Lift installations	**38,000**	**9.50**	**0.6%**
Platform lift, 2nr @ £19,000			
Protective installations	**72,000**	**18.00**	**1.2%**
Earthing and bonding, lightning protection, 4,000m² @ £2			
Fire alarm, 4,000m² @ £6			
Intruder detection system (CCTV), 4,000m² @ £10			
Special installations	**257,500**	**64.38**	**4.3%**
BMS controls installation, 4000m² @ £25			
PV to roof, 500m² @ £315			
Builder's work in connection	**102,000**	**25.50**	**1.7%**
Builders work in connection allowance @ 5% item @ £68,000			
Testing and commissioning @ 2.5% item @ £34,000			
Preliminaries and contingencies	**896,000**	**224.00**	**15.0%**
Total construction cost (building only)	**5,990,000**	**1,497.50**	**100%**

We would also like to acknowledgement Gary Chesher of Aecom and Peter Fordham of Davis Langdon, an Aecom company, for their contributions.

Project5 Architecture designed the £3m refurbishment and extension of Laycock Primary School, Islington, London