



## WALTERS & COHEN/ BEDALES SCHOOL



# IT WOULD HAVE BEEN ALL TOO EASY TO ALLOW A ROSY ARTS AND CRAFTS VISION TO KNOCK THE RIGOUR OUT OF THEIR WORK

By Kenneth Powell. Photography by Dennis Gilbert

Bedaes School was founded to educate the children of 'kind, serious, intellectual people believing in co-education, temperance, votes for women, hygiene and liberalism... their politics inclined to Socialism'. The school was established, initially at Lindfield in Sussex, in 1893 – its founder, JH Badley ('the chief'), remained headmaster until 1935 and died in 1967 aged 102. Bedales was co-educational from 1898 and rooted in the progressive thinking of John Ruskin, Walt Whitman, George Bernard Shaw and Edward Carpenter. It was a new kind of public school, far removed from the muscular Christianity of Dr Arnold's Rugby. Weaving and gardening displaced rugby and rifle drill. Bedales' alumni were more likely to become actors or artists than bishops or generals.

After the school moved to its present site, close to the village of Steep, on a dramatic escarpment above Petersfield, Hampshire, in 1900, the 'kind, serious, intellectual people' associated with it began to commission classic Arts and Crafts houses from architects such as Alfred Powell, Raymond Unwin and Barry Parker. Ernest Gimson's first work for the school was Lupton Hall, a cruck-built assembly hall paid for and constructed (in 1911) by Geoffrey Lupton, a wealthy young man from Leeds who had dropped out to become an acolyte of Gimson. After the First World War, Gimson returned to Bedales to build his masterpiece, the Memorial Library, one of the most memorable and magical of all Arts and Crafts buildings. Constructed from hand-made materials and full of books you would actually like to read, it is furnished with chairs and tables by Gimson and the Barnsley brothers.

The spell of Gimson isn't far below the surface of Walters & Cohen's newly opened teaching and administration building, 'a new heart for the school' as Cindy Walters describes it. The building is the first component in a new masterplan for the site developed by Walters & Cohen – an art, design and technology block, already given planning consent, is likely to follow within the next few years. 'Truth to materials', a key Arts and Crafts tenet with roots in the rationalism of Pugin, is fundamental to the project and poses no problems for Walters (who did a four-year stint at Foster and Partners before teaming up with Michal Cohen in 1994). But, as associate Giovanni Bonfanti concedes: 'This was our first pitched roof.' Timber has found a place in previous projects by Walters & Cohen – the visitor centre at Wakehurst Place, for instance – but not on the scale, and with the structural significance, of the work at Bedales. If there is just a hint of David Chipperfield's Henley rowing museum in the latter, the influence is freely conceded by the architects – as is, in spirit if not form, the more extreme example of Edward Cullinan's Gridshell in West Sussex.

Given the creative, artistic reputation of Bedales (persuading parents such as Lawrence Olivier, Ted Hughes and Mick Jagger, along with a number of architects, to send their children there) the school campus, Gimson aside, is architecturally something of a let-down. For the past 60 years its development has been largely entrusted to Old Bedalian architects, with sadly lacklustre consequences. From the mid-'70s to the early '90s, Barnsley Hewett and Mallinson, a practice of which Sidney



1. The influence of David Chipperfield's Henley Rowing Museum is freely conceded by the architects

Barnsley's grandson was a founding member, was responsible for a number of well-intentioned, but depressingly mechanical, buildings. A new direction was signaled, however, by Feilden Clegg Bradley's fine timber-framed Olivier Theatre, completed in 1997. The decision to hold a limited competition (in 2003) for the new teaching and administration block confirmed the school's commitment to a more enterprising commissioning agenda – Glenn Howells, Niall McLaughlin, dRMM, Burd Haward and KPF were among those on the shortlist (the involvement of Edward Williams of Hopkins Architects, a school governor with a real interest in good design, doubtless helped). Walters & Cohen were selected and planning permission obtained, with no significant problems, in time for a start on site in the spring of last year.

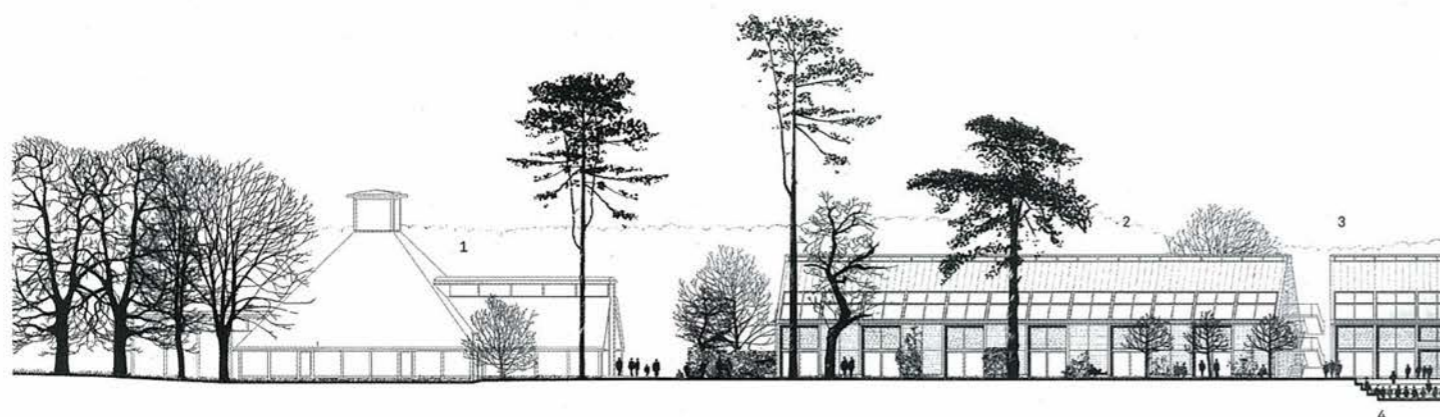
The site of the new building is both sensitive and critical to the future development of the campus. A formal gateway would be out of tune with the Bedales tradition but the point of arrival at the school appears to be via a back door – as part of their masterplan, Walters & Cohen propose relocating the road approach – and, before the new building was completed, there was no obvious 'front door' to the school. The 1960s system-built structures that the new block replaced were an uninspiring sight, especially in the context of the Orchard, the green heart of the place, with Gimson's hall and library to the south.

Walters & Cohen's work on the Bedales project was clearly informed by their participation in the DfES' 2003 Schools for the Future competition, following on from its success in the

2001 RIBA Sustainable School competition. With four other firms, the practice was asked to look at primary school design. Working with Max Fordham and Adams Kara Taylor, both of whom were collaborators at Bedales, it sought to break down the conventional division between teaching and circulation spaces and to redefine the relationship between classroom and shared/open space. The project also investigated in detail the environmental management of school buildings and the optimum use of natural light and ventilation. The lessons learned were applied in the development of the Bedales scheme.

Barns, rather than cathedrals, were the ultimate inspiration for Arts and Crafts architects from Philip Webb onwards, so it was a natural move to draw inspiration from barn structures on this site. Many of the post-war buildings at Bedales had been single storey – there is no shortage of land – but Walters & Cohen were anxious to capitalise on the magnificent views obtainable from the site and to take their cue from the scale of the Gimson library. Conveniently, the local authority's design guide for new development in Steep village specified a formula of two storeys with possible accommodation in a pitched roof.

The new development consists of two south-facing three-storey blocks, teaching to the east, administration to the west, linked by a two-storey social and circulation space, topped by a roof terrace, that runs north-south from the main reception area – the central communication point for the whole school (the axis of this space aligns with the entrance to the Gimson hall and library).



2. Sectional elevation

KEY  
 1 EXISTING THEATRE  
 2 ART, DESIGN AND TECHNOLOGY BUILDING  
 3 NEW ADMINISTRATION BUILDING  
 4 NEW TEACHING GARDEN  
 5 NEW LIVING SPACE  
 6 NEW TEACHING BUILDING  
 7 EXISTING STEEPHURST

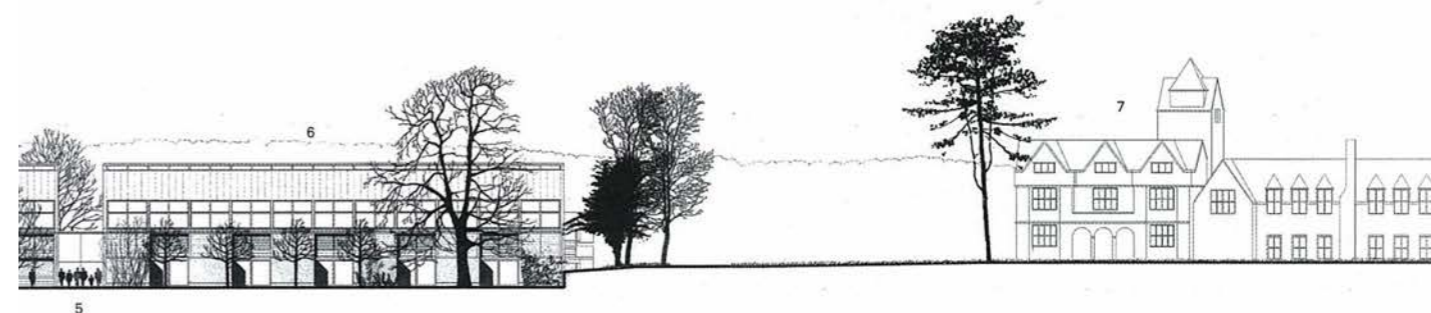
An entirely timber-framed structure was ruled out as an option early on, largely on environmental grounds. Instead, the new building uses concrete as the principal load-bearing material, providing thermal mass as well as structural stability. Around the concrete core of the building, a timber structure (of Douglas fir), propped on the concrete frame, supports the external envelope, demanding only shallow foundations at the perimeter. In the teaching block, classrooms are placed on three storeys along the northern edge, where they are protected from direct solar gain. They open on to a top-lit, highly glazed (but generously shaded) circulation space, along the south side of the building, with staff and support rooms and spaces for small-group teaching opening off them at ground- and first-floor level. Natural ventilation for classrooms and circulation spaces is provided by opening windows and roof-lights. In winter, the circulation space catches the warmth of the sun. Larch cladding (unsealed and intended to weather) and stainless steel roofs conceal generous quantities of insulation. The administration block contains cellular offices for the head and other key staff members, administrative accommodation and meeting rooms. The 'reading room' houses prized Arts and Crafts furniture and other artifacts, plus new furniture by Lord Linley.

Walters & Cohen suggest that, in cost terms, the building compares favourably to new schools in the state sector, certainly to city academies. While most state schools might not benefit from high-quality brick and timber floors and the quality of furniture seen here, it is (at around £1,700 per m<sup>2</sup>) a far from extravagant

building. Cindy Walters points out, for example, the use of simple steel balustrades (about £100 per metre) – glass would have cost four times as much. Joinery throughout is of excellent quality, thanks to main contractor Durtnell.

Walters and Bonfanti speak warmly of their relationship with the client throughout the project – 'they seemed to understand the value of design', says Cindy Walters. The school's head, Keith Budge, believes that the project's success stems from the architect's genuine concern to understand the school. 'Bedales is a community, not a business – it's a web of relationships. The building reflects that.' Budge cites 'transparency, interaction and the sense of common ownership' as factors that make it work well. Coincidentally, these are the characteristics of progressive office design, which seeks to 'break down the box'. There is every encouragement for pupils to linger after classes in the circulation space, where tables provide places to read or plug in a laptop.

Every school building should be this good. But not every school has the luxury of educating 700 pupils on a 48ha countryside site. Walters & Cohen were lucky to have the inspiration and support of an informed client with a clear vision of its needs and aspirations. It would have been all too easy for the architect to succumb to the relaxed atmosphere of the place and allow a rosy Arts and Crafts vision to knock the rigour out of its work. In fact, what it has done is to restate Arts and Crafts values in an entirely contemporary way, using the materials most suited to the task in hand. Gimson would, I think, have approved.

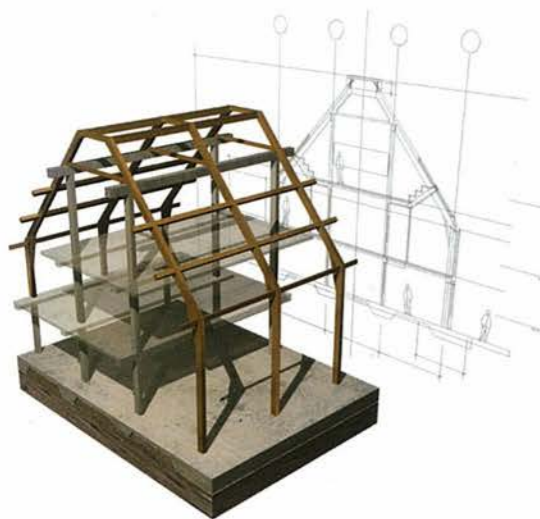


3. The entrance opens into a two-storey social and circulation space

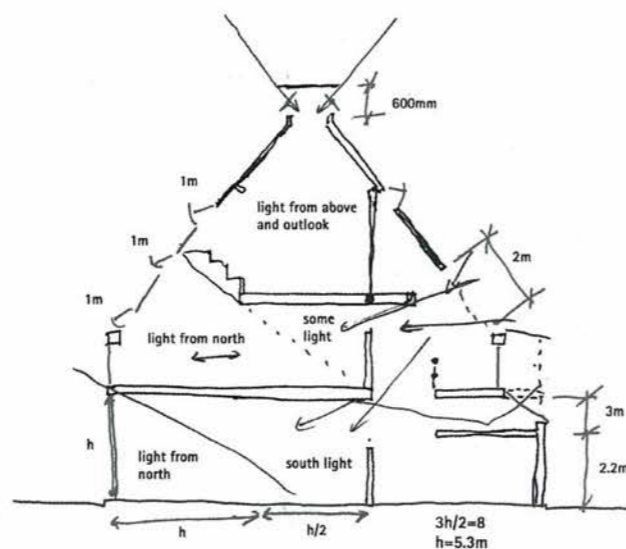


4. Smaller teaching spaces are expressed as a series of boxes along the southern elevation





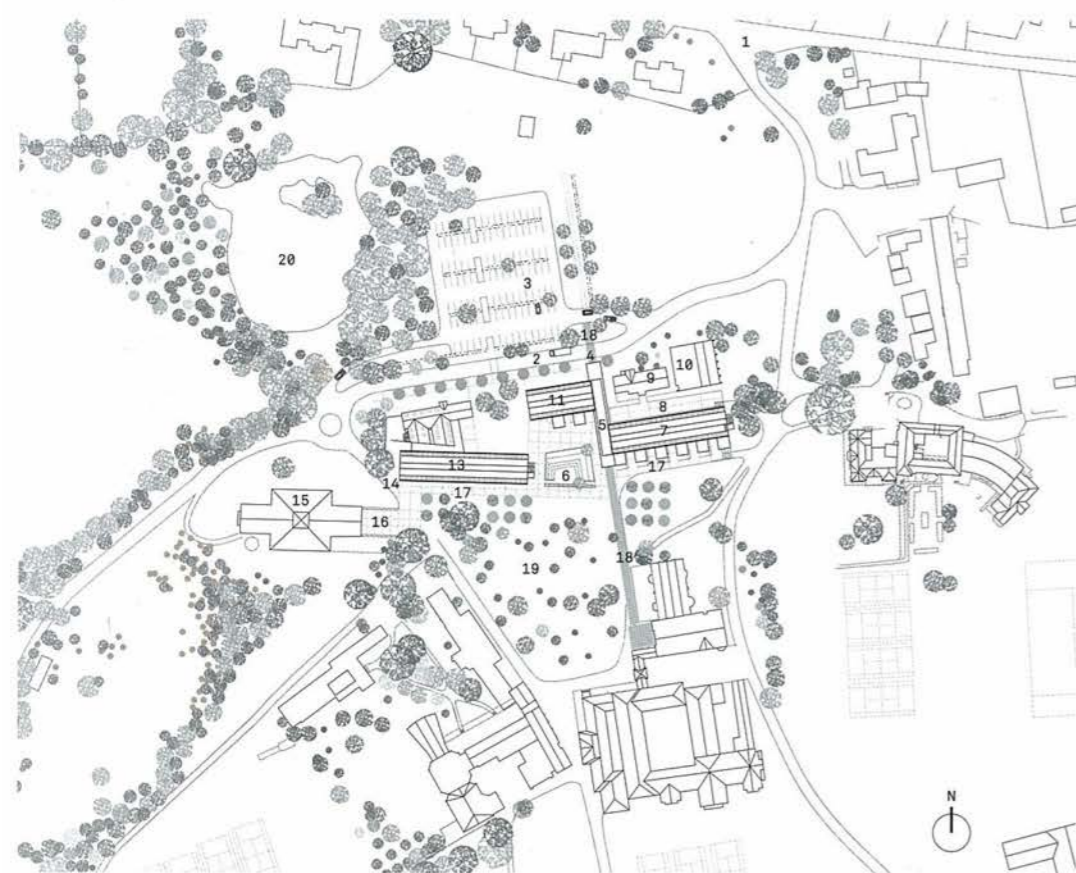
5. Structural concept by Adams Kara Taylor



6. Max Fordham's competition sketch exploring the potential to maximise natural ventilation and natural light

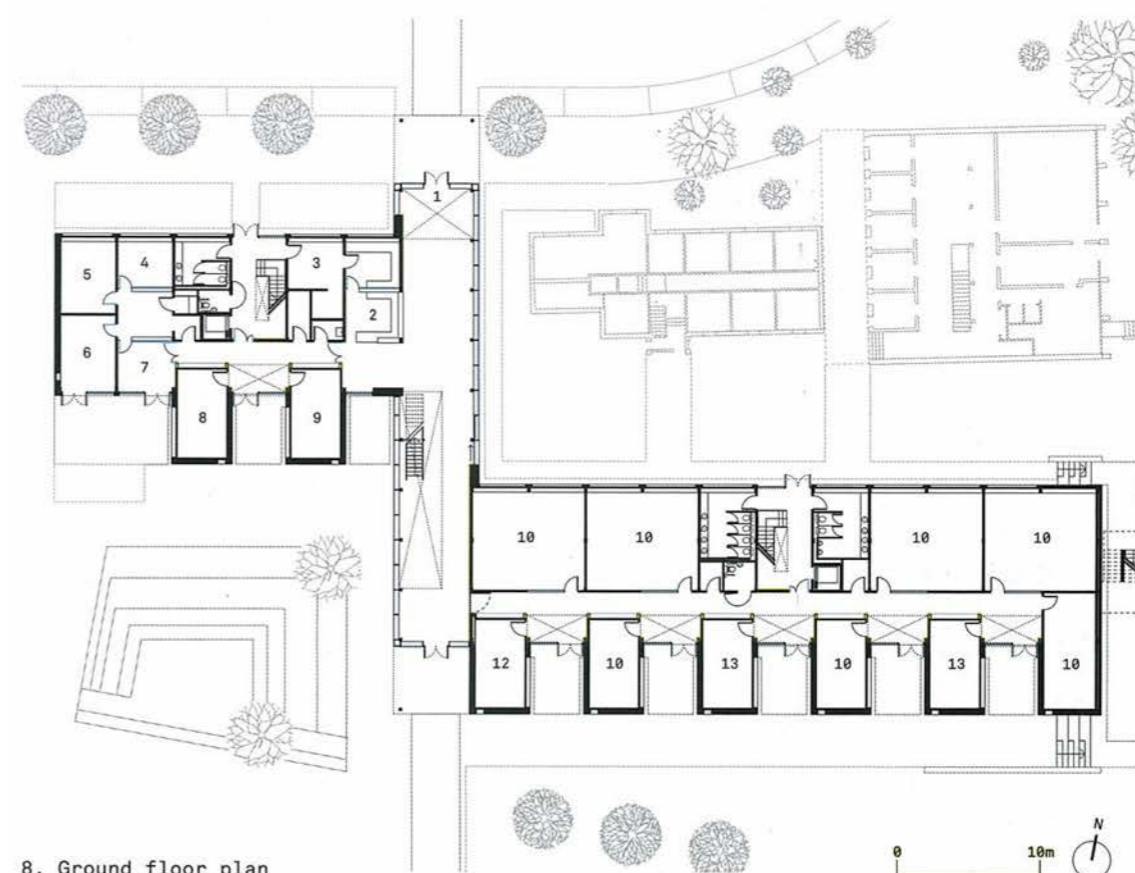


9. First floor plan



7. Site plan

- KEY
- 1 MAIN ARRIVAL
  - 2 NEW DROP OFF/DELIVERIES
  - 3 NEW CAR PARK
  - 4 NEW SCHOOL ENTRANCE
  - 5 NEW LIVING SPACE
  - 6 NEW TEACHING GARDEN
  - 7 NEW TEACHING BUILDING
  - 8 NEW REFLECTIVE GARDEN
  - 9 EXISTING I.C.T. BUILDING
  - 10 EXISTING GEOGRAPHY
  - 11 NEW ADMINISTRATION BUILDING
  - 12 NEW ART COURT
  - 13 ART, DESIGN & TECHNOLOGY BUILDING
  - 14 NEW GALLERY
  - 15 EXISTING THEATRE
  - 16 NEW THEATRE SQUARE
  - 17 NEW SOUTH-FACING GARDENS
  - 18 NEW BRICK PATH
  - 19 EXISTING ORCHARD WITH NEW TREES
  - 20 EXISTING LAKE



8. Ground floor plan

- KEY
- 1 ENTRANCE LOBBY
  - 2 RECEPTION
  - 3 OFFICE
  - 4 BURSAR'S SECRETARY
  - 5 BURSAR
  - 6 HEAD OF SCHOOL
  - 7 HEAD SECRETARY
  - 8 MEETING ROOM
  - 9 DEPUTY HEAD 1
  - 10 TEACHING ROOM
  - 11 BREAK-OUT SPACE
  - 12 DEPUTY HEAD 2
  - 13 STAFF WORK AREA
  - 14 ACCOUNTANTS
  - 15 READING ROOM
  - 16 DIRECTOR OF STUDIES
  - 17 DEPUTY BURSAR
  - 18 STUDY AREA
  - 19 LEARNING SUPPORT
  - 20 LANGUAGES



10.

## SERVICES

The environmental strategy had the following core principles:

- place the main classrooms on the north side of the building to allow them to benefit from constant, comfortable and functional north light and to be protected from excessive solar gains;
- place a highly glazed, bright, airy circulation space on the south side to act as a passive collector in the winter and ensure all three storeys are open to allow it to create a ventilation stack in summer;
- create routes for either direct or borrowed sunlight to enter each space, thus allowing the spaces to be more evenly lit from two sides and helping to create a more stimulating animated environment, without the negative effects of heat gain and glare;
- optimise the depth-to-ceiling height ratios to ensure good daylight distribution;
- use an exposed concrete structure for passive cooling and night-time ventilation;
- use sustainable materials such as the outer frame and cladding;
- insulate the building to a high standard and minimise cold bridges;
- provide good acoustic conditions throughout; and
- specify efficient building services.

Mark Skelly, Max Fordham LLP

10. Study areas on the top floor - the design team sought to redefine the relationship between classroom and shared-open space

11. The Douglas fir structure under construction

12. Construction shot showing the relationship between the concrete core and the timber structure which supports the external envelope

13. Two-storey social and circulation space



11.

12.



13.

## STRUCTURE

The approach to the structure developed from a desire to read a simple, elegant cross-section highlighting material changes where needed. Given that the low-energy concept relies on providing thermal mass, in situ reinforced concrete was selected as the load-bearing material. The key was to agree a repetitive module that coordinated with the architectural proposals.

The flexibility of the internal spaces allows for vertical structures at 8m centres longitudinally and 3.5m centres laterally across the building. A framed structure was selected in lieu of load-bearing construction with columns on a structural grid of 8m x 3.5m. The cantilevers in the circulation spaces at first- and second-floor levels' form the main beam support; this helps balance the slab forces and reduces the need for downstand beams. This approach allows the use of thin concrete slabs 175mm thick, spanning between downstand beams, that reduce the load on the foundations but maintain exposed soffits for use as thermal mass. The link space at first-floor level between the buildings is suspended on in situ RC hangers. This maximises the space at ground-floor level in the main entrance and primary circulation area.

The timber structure that supports the external envelope acts as a three-pinned arch that is propped from the primary RC frame; this ensures that a basic structural concept is retained, with the wind and snow loads transferred simply. Designing the timber structure in this way allowed the use of simple shear plate connectors between the rafter and column, avoiding the need for haunch braces. The detail at the interface between the RC and timber frames facilitated the ease of construction and adjustments for tolerances. The repetitive nature of the timber frames allowed the main contractor to set up a small workshop dedicated to their production.

As the perimeter loads are relatively light, the foundations are thickenings in the ground-floor slab, with the more heavily loaded internal columns having mass-concrete pad foundations.

John Gerrard, Adams Kara Taylor

## Costs

Cost data based on final account for gross internal floor area of 2,672m<sup>2</sup> new build  
Costs exclude temporary accommodation, direct costs and VAT

DEMOLITIONS	£20.58/m²
Demolition of life-expired timber prefabricated classroom blocks	
SUBSTRUCTURE	£60.76/m²
Traditional pad and strip foundations	
SUPERSTRUCTURE	
Frame and upper floors	£158.09/m²
Reinforced in situ concrete frame and exposed soffit floor slabs, timber frame	
Roofs	£115.36/m²
Stainless steel cladding; asphalt to flat surfaces	
Staircases	£28.95/m²
Fairface in situ concrete stairs, timber treads, metal balustrades	
External walls	£179.13/m²
Larch-clad rainscreen, glazed timber curtain walling	
Windows and external doors	£59.93/m²
Timber automatic windows and doors, double glazed	
Internal walls and partitions	£39.41/m²
Fairface blockwork, glazed partitioning to offices	
Internal doors	£34.85/m²
Solid-timber doors	
INTERNAL FINISHES	
Wall finishes	£28.48/m²
Timber acoustic cladding, quality ceramic tiles to WCs	
Floor finishes	£67.26/m²
Timber laminate floors to corridors, acoustic-backed carpet to classrooms; ceramic tiles to wet areas; brick paviors to entrance	
Ceiling finishes	£24.26/m²
Fairface sealed concrete	
Decoration	£25.61/m²
Emulsion generally	
FITTINGS AND FURNISHINGS	£97.30/m²
Perimeter casings, glazed shelves and bookcases, vanity units, notice boards, reception counter, teaching walls	
SUNDRY ITEMS	£12.10/m²
SERVICES	
Sanitary appliances	£4.59/m²
Ceramic appliances	
Disposal installations/public health	£9.56/m²
Concealed downpipes, foul drainage	



Mechanical installations	£98.58/m <sup>2</sup>
Passive ventilation, district-heating mains, underfloor and trench heating	
Electrical installations	£187.38/m <sup>2</sup>
Low-energy lighting, quality fittings, wireless data installations, underfloor services	
Lift installations	£16.79/m <sup>2</sup>
Otis standard package lifts	
Builders' work in connection with services	£1.14/m <sup>2</sup>
EXTERNAL WORKS	
Paths and planting	£123.57/m <sup>2</sup>
Stack-bonded hand-made brick path, cellular retained gravel footpaths, oak bollards, solar-powered lighting, steps, planting, land drainage	
Car park	£90.95/m <sup>2</sup>
Cellular retained gravel paving, coloured Natratex roads, solar-powered wayfinding lights, planting, land drainage	
PRELIMINARIES AND INSURANCE	£282.46/m <sup>2</sup>

### Cost summary

Cost data provided by Fanshawe

	Cost per m <sup>2</sup>	Percentage of total
DEMOLITIONS	20.58	1.16
SUBSTRUCTURE	60.76	3.44
SUPERSTRUCTURE		
Frame and upper floors	158.09	8.95
Roofs	115.36	6.53
Staircases	28.95	1.64
External walls	179.13	10.14
Windows and external doors	59.93	3.39
Internal walls and partitions	39.41	2.23
Internal doors	34.85	1.97
GROUP ELEMENT TOTAL	615.72	34.84
INTERNAL FINISHES		
Wall finishes	28.48	1.61
Floor finishes	67.26	3.81
Ceiling finishes	24.26	1.37
Decoration	25.61	1.45
GROUP ELEMENT TOTAL	145.61	8.24
FITTINGS AND FURNISHINGS	97.30	5.51
SUNDRY ITEMS	12.10	0.68
SERVICES		
Sanitary appliances	4.59	0.26
Disposal installations/ public health	9.56	0.54
Mechanical installations	98.58	5.58
Electrical installations	187.38	10.60
Lift installations	16.79	0.95
Builders' work in connection with services	1.14	0.06
GROUP ELEMENT TOTAL	318.04	18.00
EXTERNAL WORKS	214.52	12.14
Paths and planting	123.57	6.99
Car park	90.95	5.15
GROUP ELEMENT TOTAL	214.52	12.14
PRELIMINARIES AND INSURANCE	282.46	15.98
TOTAL	1,767.09	100

## Credits

Tender date  
January 2004  
Start on site date  
July 2004  
Contract duration  
13 months  
Gross internal floor area  
2,500m<sup>2</sup>  
Total project cost  
£7,500,000  
Type of contract  
JCT98 with Contractor Design Portion supplements  
Client  
Bedales School  
Architect  
Walters & Cohen: Cindy Walters, Giovanni Bonfanti  
and Karen Rogers  
Project manager  
Fanshawe: Rupert Symmons  
Quantity surveyor  
Fanshawe: Barry Rose  
Planning supervisor  
PFB Construction Management Services: Duncan Boddy  
Structural engineer  
Adams Kara Taylor: John Gerrard  
Services engineer  
Max Fordham: Max Fordham, Mark Skelly, Tamsin Tweddell  
and Rishin Patel  
Landscape architect  
Edward Hutchison Landscape Architects: Edward Hutchison  
and Claudia Corcilus  
Specification writer  
Davis Langdon Schumann Smith  
Main contractor  
R Durnell and Sons: Tom Lester, John Wakefield, Larry  
Martin, Graham Applethorpe and team  
Subcontractors and suppliers  
*Joinery* Durnell Joinery; *groundworks* Bloor Construction;  
*concrete structure* MTD Formwork; *M&E subcontractor* Working  
Environments; *glazed curtain walling* Melayway Glass Assemblies  
using Seufert-Niklaus GmbH; *rooflights* Elliott  
Premier Roofing using Vitral UK; *windows* Velfac fixed by  
Dantaag; *window controls* Window Master; *furniture* Creative  
Devise; *carpentry and timber structure* DMB Construction;  
*stainless steel roof* Pace Roofing; *asphalt roof* Southern Flat  
Roofing; *WC cubicles* WH Foster and Sons; *carpets* Tameplace  
using Christy Carpets; *balustrades* Medway Metal Fabrications;  
*doors* TDSL; *timber floor* VA Hutchison Flooring; *brick paving* AT  
Knott using Colford Bricks; *lifts* Otis Lifts; *painter and decorator*  
Adam Green

# SUSTAINABLE TIMBER WALLS TO A SCHOOL BUILDING

The new school building is designed to be environmentally sustainable; it is naturally ventilated, maximises daylight and has a cast in situ concrete structure, the thermal mass of which helps to equalise internal temperatures.

The pitched roof was partly dictated by planning restrictions; to reduce the overall area an extra floor was accommodated within the roof pitch. The steep 50° pitch also relates to the roof of the adjacent Arts and Crafts library and the Olivier Theatre.

The external wall structure consists of Douglas fir columns, purlins and rafters that form a series of simple pinned arches – connected at base, eaves and ridge. The frame is made up of composite elements (eg the 300 x 184mm purlins are formed of four 46mm timbers glued together) with connections made of steel fitch plates; as a result it was very easy to build. The windows are screened with panels of larch louvres. The infill studwork was prefabricated and brought to site ready to be clad with larch strips.

The west wall to the single-storey main reception space is a curtain wall with laminated larch mullions, transoms and face-caps. The mullions extend upwards to be fixed with steel brackets to the edge of the concrete slab. Each top-glazed panel is an opening light; its glazing extends beyond the frame so that in appearance it matches the fixed lights below it.

Susan Dawson

