

# Kingsmead Primary School Northwich, Cheshire



## Tour Features

### “Taking care of tomorrow, TODAY”

2005 Award Winner.  
Prime Minister’s Better Public Buildings Award for 2005;  
Small Building Project and Best Practice Project.  
Civic Trust Award.  
Small project of the year in the National Quality in Construction Awards.  
Runner up in SCALA Civic Building of the Year Award.



## Introduction

**Kingsmead School a 7 class, 210 place school in Northwich, Cheshire.**

The scheme Partners:  
Willmott Dixon Construction Ltd.  
Cheshire County Council  
White Design  
Mander Structural Design  
ARUP  
Mitie Engineering Services Ltd.

The project is aligned closely with the DfES “Schools for the Future Vision” and has received additional funding via a DfES Teaching Environments for the Future Grant.

Core costs met by the County Council, the land provided by a Section 106 agreement with housing developers. Several grants were provided including a DfES grant of £200,000, NWDA grant of £100,000 and a photovoltaic demonstration programme grant of £15,000.

Total cost £2.37 million with an average cost of £1815m<sup>2</sup> including construction, fees, loose furniture and equipment.





## School Facilities

Future buildings may include some, not all of the sustainable elements at Kingsmead. Part of a new sustainable construction policy within the County Council in conjunction with key partners Willmott Dixon.

Exemplar facilities include:

Larger classrooms and staff accommodation than average

Provision of small working group spaces

Winter gardens - a buffer between temperatures outside and the inside, an unheated area that can also act as a teaching area, 1 to 1 teaching and for non curricular activities such as Xmas tree competition in winter and growing tomatoes in summer.

Comfort working conditions and high quality teaching and learning environments which will help reduce sick building syndrome and sickness absence.

Reduction in space allocation for services (e.g. radiators) and additional flexibility (greater wall space)

Building Management /Monitoring System (monitors all energy used in the building, data saved on computer, will be able to use and share data with other schools via the web) which will be used as a teaching and learning aid.

Improved acoustic performance

Soundfield system

Fully equipped Hygiene Room (for inclusive education)

Dual function CCTV Security system (security and education)

Use of linoleum rather than vinyl and low asthma risk carpet (lower VOCs)

# Water Use

## Rainwater Collection

Potential Collection Volume: 1.0m<sup>3</sup>/m<sup>2</sup> collection area (2003)

Flushing Usage (approx): 180m<sup>3</sup> per year

Total Water Usage (approx): 560m<sup>3</sup> per year

Rain Water as proportion of total: 32%

Stormsaver Ltd manufacture the Monsoon rainwater recovery system. A 20,000 litre storage tank is buried beneath the eastern end of the building.

## Rainwater used for flushing toilets.

The site has a basic Sustainable Urban Drainage Scheme (SUDS). A network of trench / filter drains have been incorporated and the water is discharged into the pond at one side of the site and the natural swale at the other side of the site.

This allows for gradual discharge rather than high, concentrated flows which will:

- a) reduce erosion
- b) reduce disturbance to the existing natural drainage system and
- c) encourage retention of water in the Kingsmead ponds which will create an attractive local amenity and improve wildlife habitats. We are still in discussion with Redrow in respect of the pond adjacent to the School entrance being incorporated into the School site.

The panel on the wall enables children to monitor rainfall and develop mathematical learning in a meaningful context.

Younger pupils can learn to read bigger numbers  
Pupils learn that when a 0 comes at the beginning of a number on a display it is discounted.

Percentages are learned through the bar showing how full the tank is.

Quite complex multi-step problems can be solved such as average rainfall during a day on October (taking daily counts, adding them and dividing by the number of days).

Children enjoy seeing the panel display racing up in heavy rain and as they can see the rain falling down the pipe there is concrete support for their understanding of difficult mathematical concepts.



# Sustainable Construction Ethos

From the outset the project had sustainability as a central feature of the project.

The Project Brief required that the project should promote sustainable development by demonstrating an integrated approach to the social, environmental and economic wellbeing of the community being served, now and for future generations. The project should also reflect the objectives of the Local Agenda 21 strategy supported by CCC.

## Carbon dioxide reduction.

Timber has the lowest embodied energy (the energy used in material manufacture and transport), at 640 kilowatt-hours per ton, of any building material is renewable and biodegradable.

All timber specified included certified timber (an original spec included FSC but the timber frame sourced from Scandinavia came with the Pan European Forest Certification label PEFC).

The main use of timber in the building is softwood for the Glulam timber frame (timber supplied from the Norway company Moelven Timber AS) sourced from Lilleheden (The company has head office and production in Hirtshals in Northern Jutland, the Kingsmead frame being constructed in Jutland, Denmark).

FSC Western Red Cedar has been used for the building finish. The original source for the timber is Canada. Local sourcing was investigated with no economically feasible solution available. The cedar will turn to a silver-grey colour. There are no plans to stain.

The internal timber linings and door veneers are maple and birch. Bamboo is used as a flooring.

The aspiration of using local timber was included at the outset. Unfortunately, due to sourcing difficulties this did not prove possible. The experience of this project will be used to help inform latter projects.

Furniture is timber sourced from Blue Line Timber. FSC sourcing of timber has been sought where financially possible.

The roof has been surfaced with rubber rather than PVC based materials.

## Waste Minimisation

The construction phase has included a contract with Nick Brookes for collecting, sorting and recycling all waste from the site (company based in Wardle). In Cheshire around 3.2 million tonnes per year of construction and demolition waste arise. The project sets a good example in reducing the waste to landfill.

Secondary aggregates have been used in the paths around the school grounds, from road scrapings.

Carpet tiles contain a recycled carpet content.



## Corridor Useage

Home economics area. Flexible teaching space, room for displays.

Cooking area again is very supportive of learning in mathematics, encouraging accurate weighing and measuring as the task is purposeful.

In Science children learn about changing and separating materials through cooking, that melting is a reversible changing, burning is irreversible.

Children learn best when they are immersed in practical activity and the learning is embedded in a meaningful experience.

The bays in corridors are used for small teaching groups. We have ensured the Literacy bay is in Key Stage 2 so children having additional support also go to the area where very able readers in the infants get their reading books. This prevents the low self esteem of having to go to the 'special needs' area that many children feel and which impairs their enjoyment of and engagement with learning support.

## Flexible Teaching Space

Double classrooms includes a movable screen to create two small or one large space.

We use the flexible space to pair classes so children do not have to always work with the same 29 children. Teachers plan together and children are working on the same topic at different levels of difficulty.

Children born in Summer are not always the youngest, September birthdays are then not always the oldest in class. Brighter children have opportunities to have their learning supported and extended by older more competent peers and those experiencing learning difficulties can, as the older child, have opportunities to help, be generous and show expertise to a younger peer they are supporting. This is important and fulfils many aspects of the Every Child Matters agenda for schools.

Use of daylight also supports learning as we all know how fatiguing it can be to be sat under electric bulbs all day. By having the classrooms facing north temperature and light levels are more constant and we do not suffer glare and baking classes in Summer and cold classes in winter.

Blinds in classes provide 'dim out' for when using data projectors and also stop any glare on particularly hot and bright summer days.

Classrooms are warm to return to in winter and feel pleasant when coming back from the playground on a very hot day.



## Energy Use

Electricity is generated for the school by a roof mounted photovoltaic system.

Cost: £28,000, £14,000 from DTI Major Photovoltaic Demonstration Programme.

Supplier: Solar Century.

Panel Type: Sanyo Hybrid Crystalline and Amorphous Module.

Max System Size: 5 kwp.

Export of surplus electricity from the school has potential to feed into the national grid. An analysis of the first year of operation is now underway.



The hot water demand for the school is provided partly by a solar thermal hot water scheme.

Cost: £15,500 (Clear Skies Grant applied for but refused)

Supplier: Solar Twin

System: 4 portait panels mounted on bespoke A frame heating a 750 litre low pressure heat store preheating water prior to biomass heating.

Max System Hot Waste Storage: 750 Litres:

Total Potential Hot Water Requirement: 2,000 kwh/yr

Total Predicted Water Demand: 10,000 kwh/yr

AS Proportion: 20-30%

In the library is a solar hot water panel designed by Year 4. This heated the water 1% in November 2004. Children had met Kerr Macgregor the inventor of the solartwin panels and from him learned the concepts to produce their own model. The experience of seeing our solartwin panel through the velux window and in manufacturers brochures (used in Literacy Hour), having a model in school and meeting the inventor certainly made the learning both more enjoyable and deeper than had they been learning through secondary sources.

Automated controls for ventilation provided by Windowmaster.

Natural Ventilation regulates the indoor climate of the building by means of a controlled air change through the windows. The natural driving forces are created by temperature differences between indoors and outdoors as well as the wind around the building. The air in the building is kept fresh by ventilation through windows in the facades and the roof. The ventilation is achieved by controlled opening and closing of the windows depending on the outdoor and indoor climate and the need for fresh air.

Fresh air is an important part of being ready to learn. Teachers, immersed in the content of lessons, will not always remember to open windows and learning is impaired by poor air quality.

Building Management System is operational in the system.

Insulation material - the buildings is super insulated with at least 200 mm of insulation throughout. This is part made from recycled glass. The double glazing is argon filled.

### Winter Gardens

We use these as break out areas from the class. Children may prefer to work in an outdoors environment and they also provide great 'cooling off' space if children are in a strop! At wet play children have some access to fresh air.

Most importantly they provide a pleasant way to come into school and as children come and go via the classroom parent contact with teachers is increased.

# Food

## CBS Home Cooking scheme

Children enjoy a healthy home cooked menu every day and on Friday have the option to have chips and some more unhealthy food. Part of eating healthily is learning moderation in some foods. Children on packed lunches support this by only bringing crisps on a Friday.

Snacks include toast, breadsticks, fruit and milk. We are a nut-free school as 3 children have severe nut allergies. Children are asked not to bring sweets, chocolate or crisps for snacks.

## Garden area

Children will be working with students from Sir John Deanes College Environmental Science A level course to grow food using organic methods. Children will be measuring growth (maths) observing the life cycles of the plants (science) and will have opportunities to record their work (writing and art).

The following measures have been built into the food and menu planning strategy:

- Emphasis on homemade dishes
- Better quality base ingredients wherever possible
- Wider availability and active promotion of healthier items such as milk and fresh fruit and vegetable
- Use of home-grown vegetables from the school allotment when practicable (starting with a herb garden and scaling up when manageable)
- Incorporating as much locally sourced food from Cheshire and the NW as possible

Electronic cashless payment system.

Children have accounts which are on the computer. Parents top up their account with cash as funds run low and so can choose when and how much to pay. They can receive an e-mail on a Friday outlining what their child has eaten and how much money is left in the account.

# Biomass Boiler and Hopper

Biomass-Talbot Heating are the supplier of the CI-B biomass boiler. Around 60% of the heat demand of the school will be met by the biomass boiler. Fuel supply for the first year was pellet, but the school is now committed to source a processed waste timber fuel from Hadfields in Manchester-this will be the first useage of the fuel in the UK. The fuel is a clean wood chip from waste timber. The boiler is 80% efficient and has full modulating capacity to meet the variable heating load of the building.

Supplier: Talbotts Heating

Max Biomass Boiler Output: 60 kw

Total Heating Load: 150 kw

Biomass as proportion: 40%

Total Potential Heating Energy Requirement: 35,000 kwh/yr

Storage bunker is 10m3

Total Potential Biomass Energy Proportion: 60%



## School Facilities

Headteachers room and admin areas.

The staff office enables staff to have a work-free staff room, and all staff do take a lunch break and eat lunch together. Many have a school meal.

The staff office is a useful place for PPA time, storing shared curriculum resources and a place for LA officers such as educational psychologists to work with children.

## CCTV

A dual function CCTV system enables children to scan the school for wildlife and friends and remote access provides site security.

## School Grounds

A diverse landscape plan has been prepared for the school which in part has been implemented which includes the use of native species, woodland coppice, vegetable/herb plots and an orchard area. A new initiative to improve the school grounds is being driven forward with the assistance of a range of Cheshire organisations.

The design includes for different educational areas. The planting at the rear is designed to provide year round interest.



## Websites

### General information

[www.kingsmead-school.co.uk](http://www.kingsmead-school.co.uk)

[www.re-thinkingspace.co.uk](http://www.re-thinkingspace.co.uk)

[www.willmottdixon.co.uk](http://www.willmottdixon.co.uk)

[www.whitedesign.co.uk](http://www.whitedesign.co.uk)

[www.arup.com/](http://www.arup.com/)

[www.mitie.co.uk/index.jsp](http://www.mitie.co.uk/index.jsp)

[www.mander-sd.co.uk/](http://www.mander-sd.co.uk/)

[www.cheshire.gov.uk/ecoschools](http://www.cheshire.gov.uk/ecoschools)

[www.cheshirerenewables.org.uk](http://www.cheshirerenewables.org.uk)

### Suppliers

[www.lilleheden.dk/uk/profil/](http://www.lilleheden.dk/uk/profil/) (glulam frame)

[www.monsoonwater.com](http://www.monsoonwater.com) (gray water recycling scheme)

[www.solarcentury.co.uk](http://www.solarcentury.co.uk) (pv system)

[www.solartwin.com](http://www.solartwin.com) (solar thermal scheme)

[www.egni.net](http://www.egni.net) (pellet fuel)

[www.wrcla.org](http://www.wrcla.org) (western red cedar façade)

### Grant Aid

[www.est.org.uk](http://www.est.org.uk)

[www.nwda.co.uk/](http://www.nwda.co.uk/)

## Further Information:

John Pearson,  
Cheshire County Council Environmental Planning,  
Backford Hall, Chester CHI 6PZ  
Tel: 01244 603191  
Fax: 01244 603033  
Email: [john.pearson@cheshire.gov.uk](mailto:john.pearson@cheshire.gov.uk)

Keith Bate,  
Cheshire County Council Property Management  
Service  
Tel: 01244 602563  
Fax: 01244 603808  
Email: [keith.bate@cheshire.gov.uk](mailto:keith.bate@cheshire.gov.uk)

Catriona Stewart,  
Headteacher, Kingsmead School  
Tel: 01606 333470  
Email: [head@kingsmead.cheshire.sch.uk](mailto:head@kingsmead.cheshire.sch.uk)