



**partnerships for schools**  
building schools for the future

This case study looks at how to deliver a school fit for modern teaching techniques whilst minimising the building's impact on the environment. It will consider how the building's design, construction, management, operation and school curriculum all support the sustainability agenda.

Bideford School was the winner of the 'Most sustainable school design' category in the *Excellence in BSF Awards 2008*.

### Key project information

**Local authority:** Devon

**BSF wave:** One School Pathfinder

**Type of school:** Community College

**Project cost:** £44.25m

**Number of students:** 1,800, aged 11 to 18

**Project leads:** Devon County Council, NPS South West Limited (property consultants)

## Building sustainable schools from design to the curriculum: Bideford's experience

### Project description

Bideford College is a school for students aged 11 to 18. It is situated in Bideford, a town of 1,300 inhabitants located on the Torridge Estuary in North Devon. The school currently occupies two separate but adjacent sites and has approximately 1,800 pupils.

In redesigning the school, Devon County Council (DCC) saw the opportunity offered through the BSF One School Pathfinder scheme to create an institution of learning that cultivates the knowledge, skills and values that will enable children and young people to contribute to a future in which all people live lives of quality and dignity, and in which the productivity of the environment is restored and sustained.

The aim of the project was to build a school that not only addresses the issue of environmental sustainability, but also fulfils the following criteria:

- To maximise economic regeneration in the area;
- To expand the sustainable construction industry within Devon, both within local supply chains and by using local labour;

- To ensure ongoing maintenance of the school is minimised;
- To ensure that the school can continue the sustainability principles when maintained and refurbished in the future;
- To provide facilities within the school building which will aid the incorporation of sustainability within the curriculum;
- To link sustainability with the teaching and learning of science.

This case study will look at how it has achieved these aims through building design, construction, operation and management, and sustainability issues within the curriculum.

### Building design

DCC hoped to design a modern learning environment with the capacity to act as a catalyst for educational transformation, a learning opportunity and a tool for sustainability awareness.

The design brief was for a carbon neutral school with the capability to achieve a BREEAM rating of "Excellent" for sustainability in design.

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The design of learning areas in the building draws on lessons from the DCSF's 'Classrooms of the Future' project, which is available on Teachernet (see **Further information** for website references).

The design follows the basic principles of sustainable development/construction in line with the South West's Future Foundations Charter. Having made a commitment to Level One of the Charter by pledging to study the Principles of the Charter and to reverse activities against it, the project leads aim to commit to the highest Ambassador Level of the Charter, by championing sustainable construction practices and by sharing experiences with others.

These sustainability credentials will be achieved through the following:

- Maximum use will be made of **natural heat gains** (such as passive solar, the occupants and equipment in the school) to minimise the need for the heating plant;
- Detailed analysis **of thermal mass location** will be made, to aid the heating in winter and cooling in summer of the different areas;
- The levels of **insulation** using recycled materials will be maximised;
- The building has been designed to ensure the maximum use of **solar gain, daylighting and natural ventilation**;
- A **water management system** that minimises wastage and run-off will be adopted;
- The design ensures that energy and water use are as transparent as possible to users and that there are accessible audit and monitoring systems in place.
- The design incorporates many different renewable energy technologies, to generate a significant heat and electricity contribution and to enhance the teaching and learning of climate change and sustainability;
- Working examples of **renewable energy technologies** will be used even where these do not make a significant contribution to the energy budget of the building. The aim in this case is to teach students about renewable energy;
- The interrelation of the energy profile of the building with local weather patterns will be emphasised through a range of weather and internal environmental monitoring facilities for the building users;
- Learning and curriculum areas will provide **flexible and adaptable areas** that will minimise the need for future development;
- The design ensures that non-pedagogical areas in the building will support user health, safety and security;
- The initial design intent is reflected in the future site management plans so that provision is made to maintain wildlife **habitat diversity** and ensure biodiversity is maximised with specific reference to local species. The design team has liaised with the DCC Bio-diversity Officer and Devon Wildlife Trust to ensure that the school grounds offer a diversity of habitat that reflects Devon's rich environment and promotes understanding of the local landscape;
- The design ensures that there are appropriate **outside areas** where users can have effective protection from exposure to sun, wind and rain.

The design team has demonstrated through simulation that all aspects of the design have been environmentally modelled and that the natural ventilation strategies have been designed to ensure they are user friendly.

Students and representatives of the local community have been actively involved throughout the design process and will participate in design evaluations using the Design Quality Indicator process. This will be continued throughout the key stages of the project.

## Construction

The construction of Bideford College has supported the sustainability agenda through the following aspects:

- The project has ensured that all materials used in the building design and construction process are A-rated in the Green Guide to Specification ensuring maximum sustainability credentials for all materials;
- The design team has liaised with the Devon Sustainable Building Initiative (DSBI) and Future Foundations to source sustainable materials wherever possible and to ensure that the construction process helps to build up local expertise sustainable building. As part of this process the design team will be running awareness raising days and providing opportunities for local business in the sustainable construction industry;
- The project will help to develop an understanding of sustainability in Devon's construction industry by addressing some of the key barriers to implementing sustainable construction;
- The design aims to set examples for others in the underlying structure, energy efficiency and waste management of the building;
- The team behind Bideford has maximised the involvement of the Constructor early on in the process by using links through Devon's Construction Framework Partnership.

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## Management and operation

At an operational level, the new Bideford school building will promote sustainability through the following means:

- The design of the school ensures that the school staff and pupils have a user-friendly school in terms of ensuring that the **natural ventilation** and **day lighting** strategies continue to work in, and adapt to, different environmental conditions;
- The school has sufficient **recycling** and **composting** facilities to ensure that the school can minimise waste leaving the school premises and maximise the amount of compost being used in the school grounds;
- The school will have in place a **waste recycling policy** and action plan to ensure the maximum use of the facilities incorporated in the design. This will be linked to the curriculum to ensure that the children have the opportunity to take the lessons learnt at school into their home environment;
- The school will have a **green travel plan** to encourage sustainable travel to school. This plan will be updated annually, setting targets for improvements;
- The College Principal, Governors, staff and pupil representatives will form an **environmental group** to consider the sustainable management of the school and ensure that all the environmental aspects of the design are utilised and maintained;
- A School Energy Efficiency Policy and action plan will ensure that the low carbon nature of the school is maintained year on year. This will help maximise the benefit of the renewable energy technologies incorporated in the design. As part of the action plan there will be a user friendly guide on operating the school in the most sustainable manner. This will be developed jointly by the design team and the school. The guide will be reinforced by the design of a training programme that will be incorporated into the induction process for building users;
- The developers will seek to promote the new building's status as a sustainable centre within the

community. To support this, a digital record will be kept of the school's design and construction. To inform and educate, open access web-based information will be available during the design phase, the construction and finally the use of the building.

## Sustainability issues within the curriculum

An essential element of the new design of Bideford school is to ensure that all children within Devon can benefit from the curriculum activities associated with the school's sustainability credentials. NPS South West will be using the various networks established in Devon to ensure that sustainability issues are imbedded into the curriculum activities within the school. These groups cover a diverse area of expertise, ranging from energy efficiency, renewable energy, recycling, biodiversity and green travel.

The renewable energy technologies, efficiency demands and bio-diversity associated with the buildings and grounds will be directly linked to curriculum activities.

DCC has, for over a decade, demonstrably committed to including Education for Sustainability (EfS) as an entitlement for all children attending its schools and colleges. It is one of only a handful of local authorities that has an adviser for education for sustainable development contracted to work with schools on EfS initiatives. The commitment of DCC to EfS is further evidenced by the fact that 'Learning for Sustainability' is included in the 2006-2009 Devon Children and Young People's Plan as an entitlement for all.

There is an expectation therefore that all schools and colleges in Devon will embrace EfS initiatives during the lifetime of the plan. The new Bideford College, as a flagship institution, will function as an EfS model for all other education institutions to follow, both within Devon and nationally.

## Key contact

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## Further information

Classrooms of the Future: [www.teachernet.gov.uk/management/resourcesfinanceandbuilding/schoolbuildings/innovatedesign/sbschoolsforthefuture/futureclassrooms/](http://www.teachernet.gov.uk/management/resourcesfinanceandbuilding/schoolbuildings/innovatedesign/sbschoolsforthefuture/futureclassrooms/)

South West's Future Foundations Charter [www.futurefoundations.co.uk](http://www.futurefoundations.co.uk)

Green Guide to Specification: [www.bre.co.uk/greenguide/page.jsp?sid=435](http://www.bre.co.uk/greenguide/page.jsp?sid=435)

Bideford College website: [www.bideford.devon.sch.uk/](http://www.bideford.devon.sch.uk/)