Bishops Wood Environmental Centre

Location
Kidderminster, Worcestershire

Brief project description
To design a sustainable building in harmony with its environment, and causing minimal environmental damage, both in construction and in use. The building should use energy and water as efficiently as available technology permits, with materials having minimal environmental impact in manufacture.

Cost of project
£300,000

Participants
National Grid Transco, which owns the land, and Hereford & Worcester (now Worcestershire) County Council, which owns the Centre, each put up £100,000. The local Training & Enterprise Council (TEC) gave another £100,000. The architects were a county council team, comprising Iain Paul, Dave Millis, Duncan Bicknell and Isobel King.

Timescale for the project
Bishops Wood Centre opened in 1989. Three years later, in 1992, planning began for the new building; this was completed and opened in 1994.
In 1995 it was runner-up as *Green Building of the Year.*

Space location
Bishops Wood covers 70 acres (28 hectares) of ancient and newly planted woodland, meadows and ponds. The site includes a straw-bale house powered by solar cells and wind generators, a reconstructed Saxon hall, and an environment-friendly 'Home for Life' building by artist and architect Roger Dean. He is designing an early-years environmental centre for the site.

Background to the project
In 1989, the Centre inhabited a single portakabin (later two). Its popularity meant that staff soon needed a permanent and larger building incorporating classrooms, toilets and office space – one which fulfilled their environmental principles, and accommodated their learning programmes for schools on sustainability, biodiversity and the natural world. The Centre also offers courses and seminars for education and environmental professionals; advises schools and business on environmental matters; and runs a forest school scheme for early-years children.

The development process
How do you design a successful indoor space with the aim of encouraging children to go outside? Director John Rhymer explains: 'Most of our learning takes place outside. This makes the indoor space even more important because children are there for a relatively short time at the start of their visit. So a building needs to do a special job of enthusing and motivating the children for what we are going to achieve during the day.'

The building had to create a visual excitement and anticipation in children and adults, sharpening their senses. It also had to link built and natural environments. 'When it came to briefing the architectural team,' says John Rhymer, 'we knew what we wanted from the building but not what it might look like. That was the architects' job.'

The building's circular design 'just evolved' as the most practical way to fulfil the design requirements, says architect Dave Millis. 'It was a hard battle with ourselves as we thrashed out the ideas we had for an organically designed building. It is really a simple building that came through a lot of hard work.'

The outcome
'We wanted, and got, a building that demonstrates best practice in terms of sustainability and enables people to see what that best practice is,' John Rhymer confirms. 'Many things are on the surface, and people can see what the building is made of.'

The timber building has solid tree trunks supporting the perimeter, with intermediate supports and beams of laminated wood. Paints and stains are organic. External walls use a breathable wall technology. Insulation is made from recycled telephone directories. Roofs are made of turf and cedar shingle, and insulated with rockwool and warmcell.

Inside is what Dave Millis calls 'an Aladdin's cave of the environment'. Children arrive at the meeting space (a gazebo), go to the cloakroom area, then into the large central space with floor and walls decorated with animal and plant patterns. Coloured footprints of different animals guide visiting classes to the various rooms. Throughout, children can open cupboards and discover exhibits for themselves. The building combines child-related and adult-related spaces and fittings, such as windows at different heights and every surface being touchable. Local schoolchildren made some of the door handles.

In the foyer, a central stairwell or tower, made from reclaimed bricks, both supports the building and acts as a thermal store. Vents in the roof and floor maintain an even temperature as the air circulates around the building. A foyer display incorporates electricity meters recording its different uses; energy use is monitored for efficiency, with lights going off and audio-stats turning the heating down when rooms are unoccupied. Water is conserved via a grey water system and reed bed sewage treatment. Chains hang from the building so children see where the water runs when it rains and understand the water cycle. In the toilets, large murals, painted by A-level students, explain the water cycle. Both paper towels and hot air dryers are available for hand drying and visitors are invited to make an informed choice. Paper towels are now composted on site.

Features:
- A sustainable space which uses its own structure as part of the learning process
- The challenge of seeing a building as a 3D teaching tool
- The challenge of designing indoor spaces which encourage visitors to engage with the outdoor space
- The benefit of architect involvement and enthusiasm
- The benefit of observing children and other visitors in action as part of the design process

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In the Woodland room, children can explore shelves with natural objects and view, via close circuit video cameras, mice and voles feeding, and video footage of badgers and foxes visiting the previous night. The Woodpecker room has one-way glass to watch birds at nearby feeders and nest boxes. A weather station on the roof transmits information to an automatic display inside. The Solar room, housing the resource library, provides passive solar heating. The linoleum flooring is made from sustainable sources of cork chips, linseed oil and jute. The south-facing part of the roof has solar panels providing hot water.

The building nestles in woodland rather than in a clearing. Designing the outdoors was as important as the indoor spaces, explains forest school coordinator Jenny Doyle. Trees were cleared sufficient for the building, and trees will eventually grow through the boardwalk. The path from the car park meanders through the wood so you don't see the building until you are close.

A tight budget and some lack of skilled workers meant that some plans were abandoned, such as windows in the staircase tower. The work took 18 months rather than six; architects did a lot in their own time and staff, architects and their families did the cleaning up and planting.

Lessons learned

'When we first moved in we said we were 98% happy with the building. There was a lack of vents in the solar room because of the budget, and a dead-end in the cloakroom – children tend to get caught up there. It worked extremely well for a number of years, until we became victims of our own success.' There was pressure to increase numbers and a building meant for two classes now copes with three. The portakabins are still used.

The rooms were designed with children in mind but are not like classrooms, so they also work well for adults. However, facilities are not specifically designed for early-years children. Problems are overcome by, for example, providing steps up to sinks and loos and regulating hot taps. For teacher Helen Ferguson, successful use of the building means a balancing act between adult and children's sessions. 'We would also like more toilets because of the greater number of children.'

The smaller classroom accommodates 60 young children, or 30 adults – but only 15 bag-laden A-level students. Demand for adult use has grown significantly, and this has led to a shortage of storage space. 'We have odd-shaped equipment which does not fit easily into drawers and cupboards – even though our storage space was quite considerable,' says Rhymer. Similarly, office space became inadequate quite early on. Some storage space is used for other things: for example, space for stackable chairs became the electricity cupboard because the fuse boxes were too big to be accommodated in their originally allocated space.

Dave Millis adds: 'Technically, we would have liked blinds which come into play as the sun moves around. We also wanted ducting that moved warm air around the building before being evacuated. But at the time, there was little expertise in innovative ventilation arrangements.'

Key factors

The most crucial aspect of this approach was that architect Dave Millis spent time observing the children. 'Ideas for the design came from seeing what they do and how they move through and around a building; how they use their eyes and senses.'

He continues: 'We had never been involved in a job like this before, and there was little information on how to do it. We started with a raw brief of the spaces needed. We began to see the building as a three-dimensional teaching tool, and how that relates to the Centre's work and the landscape. Talking to people helped us build a vision of what it should look like and how it should be built.' He also cites the Centre's infectious enthusiasm. 'If you have an enthusiastic client, the building reflects that. If you get clients who don't know what they want, you have problems.'

On ICT, John Rhymer argues: 'We don't want to stick children in front of computers here, but rather put them in touch with the real world.' However, computer and video technology can enable the team to extend the influence of a visit with advance preparation, web links to the Centre's activities, and downloadable materials for teachers and pupils.

Rhymer concludes: 'The adults who come here tend to comment on the spaces, exhibits and fittings. The children don't comment, their eyes just light up.' Perhaps the most revealing comment comes from architect Dave Millis: 'I come back regularly. I can't keep away.'

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