

NHS Trusts – embracing sustainability

OGC Case Study

Sustainability and biodiversity key to delivering new hospital in Oxford through Public Finance Initiative (PFI)

The Oxford Radcliffe Hospitals NHS Trust is working with Carillion Health to deliver £135 million of new build works to the John Radcliffe Hospital in Oxford. Together, the Trust and Carillion Health are pioneering a biodiversity action plan. A sustainability action plan is also being rolled out, after being successfully piloted at the Great Western Hospital in Swindon. The plans ensure that the project has a positive impact on both the environment and local community. The project is an example of incorporating sustainable solutions from a brief, through design, into construction. It has proved to be an excellent basis for the Trust to carry forward its successful ideas to the next PFI project.

Achievements and benefits

- A waste management company has been employed to dispose of and segregate waste – on average, 40 tonnes of waste are produced by the project each month. **Benefits:** More than 90 per cent (36 tonnes) of the waste per month has been diverted from landfill
- A permeable pavement has been used in the staff car park. **Benefits:** Pollution is filtered from the surface water and there is less peak storm water discharge
- Introduction of a green transport plan for site workers. **Benefits:** Car sharing schemes have reduced carbon dioxide emissions by at least one-fifth (20 per cent)
- 60 per cent of the flooring selected for the project is linoleum. **Benefits:** Linoleum is manufactured from renewable raw materials and is biodegradable. It enhances replacement life cycles from the typical 10–15 years for vinyl, to 25 years – a potential saving of £264K over the lifespan of the project
- Ceiling tiles have been selected, consisting of about 30 per cent post-industrial waste, which do not require metal fixing clips. **Benefits:** About £60K saved and the tiles are environmentally friendly

- Good working collaboration adopted with paint supplier. **Benefits:** Paint supplied in 10 litre metal cans, thus eliminating the need for polyethylene terephthalate (PET) plastic cans, which cannot be recycled after paint contamination. Biocide paint used throughout the hospital helps to reduce the risk of cross infection
- The project team has worked with the local community and sponsored a local wildlife group. **Benefits:** 100 bird boxes made out of recycled material were donated to the local community. The wildlife group will plant an ancient hedgerow on site to use as an educational resource for a local school.



■ The new build works at the John Radcliffe Hospital, Oxford



NHS Trusts – embracing sustainability



■ Central staircase and children's hospital

Introduction

The Oxford Radcliffe Hospitals NHS Trust operates from four sites: The John Radcliffe and Churchill hospitals in Headington, the Radcliffe Infirmary in Oxford city centre and the Horton Hospital in Banbury. Together, they make up one of the largest trusts in the country. The Radcliffe Infirmary, dating back to the 18th century is due to close in 2007.

The NHS Trust needed to develop a dedicated children's hospital and an adult's centre on the John Radcliffe site. The scheme would enable the relocation of clinical and associated services, as well as university departments from the Radcliffe infirmary to the John Radcliffe Hospital. In December 2002, The Hospital Company (THC) was selected as a preferred bidder for the works through a public tendering process. THC operates as a consortium, comprising Carillion Private Finance and the Royal Bank of Scotland.

In December 2003, the Trust signed a £135 million PFI contract with THC for the project. RTKL Architects were selected for the design and Carillion Building employed for the construction. When completed, the project will provide general hospital services to Oxfordshire's 625,000 people and specialist services to about 2.3 million in the county, surrounding areas and beyond. Patients will benefit from being treated in modern buildings with state-of-the-art equipment, concentrated on fewer sites.

The project will deliver 55,000 square metres of new building facilities, including:

■ A children's hospital

Purpose-built to cater for children and their families, it will provide a comprehensive range of paediatric inpatient and outpatient services under one roof

■ An adult centre

A new west wing will be built, housing inpatient and outpatient services for neuroscience and specialist surgery – ear-nose-throat (ENT), ophthalmology, plastic surgery and craniofacial surgery. It will contain a new day surgery unit and critical care facilities, including 14 theatres, a neuroscience Intensive Treatment Unit (ITU)/High Dependency Unit (HDU) and a neuroradiology unit.

Principles and objectives

The overall objective for the project is to deliver integrated clinical teaching, training and research facilities, with the consequent improvement in service quality, clinical collaboration and medical advancement. The business case acknowledged that seven further specific objectives would ensure this was achieved. Three of these strategic objectives highlighted the need for sustainable solutions, as listed below:

- To provide a flexible facility that will adapt to the changing requirements of healthcare in the 21st century, with minimal disruption to patient services and site activity
- To provide revenue savings from reduced estate running costs, maintenance and upgrading costs
- To work in partnership with local government to deliver an environmentally beneficial solution providing medicine in Oxford throughout the 21st century.

The Trust wanted the PFI project to provide a flexible, cost effective and environmentally sustainable solution for the works. The project gave the Trust an exciting opportunity to ensure it could offer a service that would meet the changing requirements of 21st century healthcare.

Major issues

The project presented several challenges:

- The works had to take place on an existing and operational site, therefore disruption to existing patients, staff and local residents had to be limited
- Safety and environmental matters had to be managed
- The programme of works had to be driven forwards at speed
- The project had a large scale of works planned.

To address these issues, action plans were developed.

Sustainability and biodiversity action plans

Carillion had previously been involved in the Great Western Hospital project at Swindon. While at Swindon, the project team pioneered the development of a 'sustainability action plan' and a sustainability accounting framework. The plan facilitated the consideration of sustainable solutions, which helped to add value to the project, while the accounting framework helped to assign financial information against the sustainable initiatives. Carillion wanted to transfer the principles applied and lessons learnt at Swindon to a new project. The chosen project would be a showcase for Sustainability and a flagship for Biodiversity awareness. The John Radcliffe Hospital in Oxford was chosen to be the exemplary project.

Several of the Carillion team at Swindon moved to the Oxford project, thus facilitating the knowledge transfer process. Key lessons taken forward from Swindon included:

- Consideration of energy targets
- Waste management initiatives
- Information database proposals.

Sustainability action plan (SAP)

The SAP created for Oxford operates in a similar way to a typical risk register. Ideas are charted, allocated a reference number and championed, then monitored for progress. The plan is separated into sections, such as material specifications, use of recycled aggregate, construction waste, pollution, transport, safety and communication with local groups.

Biodiversity action plan (BAP)

The processes applied to create the SAP could be adapted to monitor ideas and proposals concerned with biodiversity. Hence, a biodiversity action plan was created. The BAP focuses on issues such as plant selection, management of local resources and the promotion of biodiversity.

Many of the ideas and proposals from both the SAP and BAP were adopted for the project. A number of these have greatly benefited the scheme and been highlighted in this case study. More details on the successful initiatives are provided below.

Successful initiatives

■ Waste management

A waste management company has been employed to dispose of and segregate waste at an off-site facility. The project produces about 40 tonnes of waste a month, and more than 90 per cent of this has been diverted from landfill through the construction process. Six examples highlighting the re-use of waste products are:

- Pallets – sold to pallet supplier
- Wood – re-used where possible, mulched for animal bedding, etc
- Topsoil – added to compost stock for further composting
- Tins – separated dependant on material
- Cables – stripped for copper, and sheath mulched for re-use as sports surfaces
- Plastic – sent overseas for production of fleeces.

■ Design

It is generally recognised that a more effective healthcare environment can be achieved within a quality visual environment, produced by carefully thought out architectural and landscaping schemes, and through specially designed visual arts programmes.



■ *Artist's impression of the proposed new developments*

The following two examples show how design considerations have been incorporated into the project:

Aqua Pave parking surface

The hospital staff car park uses a permeable pavement to drain and store surface water. This has been designed to help reduce the risks of localised flooding and water pollution. Water is collected in large attenuation tanks, which reduce peak storm water discharge from the new development. The water draining through a medium also filters pollution from the surface water, which further benefits the local environment and receiving watercourse.

Landscape design

The landscape design has been planned to sustain the local wildlife populations. The design principles aim to:

- a) Protect and enhance existing site features and areas that benefit wildlife, particularly mature trees, hedgerows and rough grassland
- b) Strike a balance between the aesthetics of ornamental species and the ecological diversity of native planting.

Plants in car parks form screening to break up large areas of hard landscape, while attracting birds and insects. Existing rough grassland is retained, to the edges of car parks, and managed to enhance the ecological diversity.

■ **Staff and contractors**

A green transport plan was implemented to control the impacts of the project on the environment. Trade and materials were sourced locally, with car-sharing schemes introduced for construction staff. These schemes have helped to boost the local economy and reduce travel costs and traffic congestion.

Currently, there are about 400 contractors on site, and only one car park pass is issued per four trade contractors. Several trade contractors use mini-buses to ferry their staff from pre-arranged pick-up points to the site office. These schemes are estimated to have reduced emissions by one-fifth (20 per cent) over the contract period.

A 'clear site' policy was adopted – contractors agreed to clear and tidy all apparatus and debris at the end of each day. This housekeeping has contributed hugely to the excellent safety record to date. The site has achieved more than half a million man-hours without a reportable accident.

■ **Materials selection**

Materials used on the project have been selected after in-depth option appraisals that considered factors such as cost, buildability, life cycle, programme, maintenance, environmental impact and sustainability. Examples of materials selected for the project are:

Sheet flooring

About 60 per cent of the flooring selected for the project was linoleum. This is made from renewable raw materials and has a very good environmental performance when compared with other products, such as vinyl. Linoleum has the added benefit of enhancing replacement cycles from the typical 10–15 years for vinyl, to 25 years, potentially saving about £264K over the life of the project.

Ceiling tiles

Ceiling tiles comprising about one-third post-industrial waste have been selected. The tiles are also heavier than usual mineral fibre ones, thus eliminating the need to expend energy manufacturing and installing metal fixing clips and saving the project £60K.

Timber

Carillion is committed to the responsible procurement of forest products. The company actively pursues a 'Responsible Forest' products procurement policy. Where independently certified timber is not available, preference is given to timber supplied by companies that have adopted a formal environmental purchasing policy.

Wall paint

A close, collaborative working relationship with paint manufacturers ICI has driven forward innovation. This is the first British project to trial a new biocide paint system. All the painted walls will contain a biocide that helps to control and combat infection within a hospital environment. Carillion recognised the fact that ICI could not find a recycling route for their PET plastic cans, and worked with ICI to provide paint in 10 litre metal cans, which can be re-used through established recycling routes. This is currently the most sustainable solution, which has eliminated the need to manufacture 5,000 PET plastic cans. All the paint used for the project is water-based, helping to reduce volatile organic compounds (VOCs).

■ Working with the local community

Carillion have joined forces with the New Marston Wildlife group, as part of a community relations plan. The aim is to help regenerate animal and plant life, while involving and educating the local community about the hospital works. Carillion will assist and partly sponsor the group, over a two-year period, in several areas of their work, which impinges on the hospital building site and surrounding areas. One of the planned projects for the group will be to plant an artificial hedgerow in the car park. This will be an educational resource for a local school in teaching ecology, geography and sustainable development.

Other initiatives have included donating 100 bird boxes, made out of recycled birch trees, to the local community. They will enhance and maintain the bird life around the hospital site for years to come. Six semi-mature oak trees have been saved from destruction by being moved from nearby parkland and replanted on site. They will help to screen the car park and leave a legacy for the future.

Lessons learnt

- The project team has bought enthusiasm and innovative practices into the work at Oxford. The sustainability and biodiversity action plans have facilitated the identification and implementation of innovative ideas. The Oxford Radcliffe Hospitals NHS Trust has been encouraged to create and champion their own biodiversity and sustainability action plans
- The project team has realised the importance of open communications. Local residents, hospital staff, local groups, suppliers and contractors are aware of the works and willing to contribute and/or participate in project schemes



- The project team has worked in a flexible and adaptable manner, adopting a process of continuous improvement. This has allowed the creation and implementation of a biodiversity action plan, which has brought tangible benefits to the project – as shown in the diagram



- The estimated energy usage for the whole John Radcliffe building is 56.01 giga-joules per 100 cubic metres per year; which falls marginally outside the 35–55 giga-joules per 100 cubic metres per year NHS mandatory requirement range. This is a lesson learnt, which Carillion must take forward and improve on in future projects.

Contacts

How does your project measure up?

For further information on this NHS PFI contract, please contact:
 Vickie Holcroft, Oxford Radcliffe Hospitals NHS Trust
 t: 01865 228 580
 e: vickie.holcroft@orh.nhs.uk

For issues relating to sustainability and biodiversity, please contact:
 Jas Dhami, Building Economist, Carillion
 t: 01865 755000
 e: Jas.Dhami@carillionplc.com
 w: www.carillionplc.com

For any other construction related queries, please contact:
 Clare Knowles, Corporate Communications Adviser, Carillion
 t: 01902 316 369
 e: Clare.Knowles@carillionplc.com
 w: www.carillionplc.com

Any feedback on this case study?

Please contact OGC Service Desk
 t: 0845 000 4999

About OGC

OGC - the UK Office of Government Commerce - is an Office of HM Treasury.
 The OGC logo is a registered trademark of the Office of Government Commerce.

OGC Service Desk

OGC customers can contact the central OGC Service Desk about all aspects of OGC business.
 The Service Desk will also channel queries to the appropriate second-line support. We look forward to hearing from you.

You can contact the Service Desk 8am - 6pm Monday to Friday
T: 0845 000 4999
E: ServiceDesk@ogc.gsi.gov.uk
W: www.ogc.gov.uk

Press enquiries

T: 020 7271 1318
F: 020 7271 1345



Office of Government Commerce