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One Kingdom Street, UK

Case Study 36

One Kingdom Street is a state-of-the-art office building in Central London, which was the first Skanska UK Building project to implement a Sustainability Plan in addition to the standard Environmental Management Plan.

Aspects of Sustainability

This project highlights the following:

Social Aspects

Human Resources

Corporate Community Involvement

Business Ethics

Health and Safety

Environmental Aspects

Energy and Climate

Materials

Ecosystems

Local Impacts

Economic Aspects

Project Selection

Supply Chain

Value Added

Project Introduction

One Kingdom Street is a twelve-storey state-of-the-art office building that was completed in February 2008. The project was part of the second phase of the PaddingtonCentral redevelopment project situated close to Paddington Station in Central London.

Skanska UK Building was the general contractor of the US$145 million project between 2006 and 2008 for the property development company Development Securities. The building accommodates 24,490 m^2 of open-planed office space on ten floors and two basement auxiliary levels. One Kingdom Street has been designed around two central atria, which house six scenic wall chamber lifts. The building has been partly constructed on a deck structure to enclose future works access for the construction of London's Crossrail.

One Kingdom Street was the first Skanska UK Building project to implement a Sustainability Plan in addition to the standard Environmental Management Plan, at the request of the client, and has set a sustainability benchmark for all other Skanska UK Building projects. The building exceeded client demands for a BREEAM environmental assessment by achieving an impressive *Excellent* rating. Skanska also registered the project with the National Considerate Builder's Scheme and Westminster Council's Considerate Builder's Scheme, which are designed to encourage best practice beyond statutory requirements.
The project scored highly in the three Considerate Constructors Scheme external audits, which ranked the project among the top 10 percent of all registered projects in terms of environmental and social issues. Following the completion of the project, One Kingdom Street was also honoured with a Gold and Bronze award at the national Considerate Constructor Awards.

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Contributing Toward Sustainable Development

One Kingdom Street is a state-of-the-art office building, which utilises on-site renewable energy and has contributed toward urban redevelopment and sustainable urban planning in Central London. During construction Skanska implemented a Sustainability Plan, which strived to ensure that the project contributed positively in terms of social, economic and environmental issues. Stakeholders were actively involved in the project, and occupational health and safety programmes and a school safety awareness project were implemented. The construction phase promoted local economic benefit through direct employment, skill generation, the use of regional materials and through indirect economic impacts. An Environmental Management Plan was implemented to minimise environmental impacts, which included water usage, energy consumption, waste management, recycling and transportation. The project included a pioneering study to calculate the embodied carbon footprint of the building during construction. Skanska has also raised awareness of more sustainable buildings and construction through local initiatives and national media.

Social Aspects

Stakeholder involvement

Skanska actively involved the client, project subcontractors and the Paddington community in the planning stages, environmental initiatives and health and safety programmes. Paddington residents and businesses were informed and involved through the Paddington Central Estate Management office and the Paddington Waterside Partnership, who have well-established relationships with the local community.

School safety awareness

Skanska initiated a programme to raise awareness of the dangers of trespassing on the construction site among school children in the Paddington area, in collaboration with Paddington Waterside Partnership and British Waterways. In February 2007 fourteen activity days were held on a barge moored adjacent to the site, which involved over 300 school children from the Paddington area. Each day included presentations on the dangers of playing on the site, construction techniques and environmental issues, and children had the opportunity to observe site activities from a safe distance. A safety poster competition was organised with prizes, and the posters were put up around the perimeter fence to discourage other children from trespassing on the site. During the project there were no incidences of children trying to gain access to the site.

Occupational health and safety

Several safety programmes were initiated, there were no major accidents on site and the Lost Time Accident Rate was 6. The *Near Miss* safety programme, involving worker incentives and awards, was initiated to encourage all site personnel to be aware of and report potential hazards verbally or by completing a Near Miss card. During the programme a total of 2,152 Near Miss cards were raised, and the initiative is thought to have increased personal safety awareness, reduced the accident rate and improved workforce and contractor relations. Skanska offered the *Working at Heights* safety programme to contractors, and between November 2006 and October 2007 twelve courses were held on site. Skanska also provided the IOSH (Institution of Occupational Health and Safety) *Supervising Safety* course to all contractor supervisors. Occupational Health Open Surgeries were available to the transient workforce, some of whom may rarely have the opportunity to visit their own GP. The London Fire Brigade also used the site for training exercises and identified key areas to help improve their rescue procedures.

Raising awareness of more sustainable buildings and construction

Skanska has sought to raise the public profile of the sustainability aspects of the project by conducting presentations for school children and local initiatives, such as the Westminster Excellence in Cities programme. Skanska also raised awareness of sustainability issues among the project workforce through awareness campaigns and working towards project sustainability objectives with project partners. The pioneering One Kingdom Street carbon footprint study has also featured in a UK building industry magazine.

Sustainable urban planning

One Kingdom Street is within walking distance of amenities and retail outlets at the award winning Sheldon Square, and has excellent access to public transport. The building is adjacent to Paddington Station with four London Underground lines, overland train services and the Heathrow Express rail service, which makes the 15-minute journey every 15 minutes. Only 20 car parking spaces are provided in the underground parking area, which discourages car usage.

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Economic Aspects

Local construction employment

Approximately 350 workers were on site during the height of construction. Skanska encouraged trade contractors to use the local recruitment organisation Paddington First, to contribute toward reducing unemployment and creating a more skilled workforce within the area. The majority of workers were from the London area and a Skanska travel survey indicated that 54% of workers lived within 16 km of the site.

Regional material suppliers

All materials were manufactured within the UK, except for the cladding and the atrium bridges. Regional materials were preferred in order to support local economies and minimise the environmental impacts due to transportation.

Local economic development

Businesses in the Paddington area are thought to have benefited indirectly during construction from the large number of site workers. Skanska promoted the use of local businesses and services among the construction workforce by distributing free Paddington Waterside Partnership guidance booklets and leaflets from the site offices. The operational One Kingdom Street will benefit the local economy by attracting businesses to the Paddington area.

Urban redevelopment

Prior to the project the site was a cleared brownfield site used as a car park. One Kingdom Street is part of the second phase of the PaddingtonCentral redevelopment project, which is a mixed-use development including offices, apartments, shops, leisure facilities, landscaped gardens and pedestrian-friendly areas.

Environmental Aspects

Environmental Management Plan

The plan included water usage, energy consumption, waste management and recycling, transportation and carbon dioxide emissions during construction. A monthly environmental report was submitted to the client, which quantified environmental performance and allowed Skanska to identify areas for improvement on site and for future projects. The information was also made available to contractor companies to engage them in the process and show the results of their environmental work.

Site water efficiency

A recycling system was established to reuse vehicle jet wash water on the main entrance, which included a trench drain and settlement tank to collect and separate the water. Jet wash water usage was reduced from 420 m^3 to 290 m^3 per month following the instillation of the recycling system. Water efficient fixtures were also installed in the site washrooms, offices and canteen, and site security made regular checks for water leaks.

Site energy consumption

A campaign to minimise site electricity consumption involved energy use posters and daily email reminders to turn off all computers and air conditioning on leaving the site offices. Site task lighting was switched on only as required and site security ensured that only minimal security night lighting was used.

Waste Management Plan

The waste management plan resulted in the recycling of approximately 97 percent of site waste, by minimising the accumulation of waste on site, reusing waste on site and recycling construction waste off-site where necessary. Site waste was minimised by encouraging sub contractors to prefabricate materials, making accurate orders for construction materials, using reusable pallets, requesting minimal packaging and instructing suppliers to collect their packaging. Waste was reused on site where possible, such as by using sub soil as backfill or for landscaping, and reusing timber shuttering for general carpentry. The remaining construction waste was segregated into twenty different waste streams before being recycled off site.

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Travel Plan

The travel plan sought to reduce the impact of employee transport, site deliveries and waste collection during construction by working with Skanska employees, contractors, suppliers and site visitors through posters and site inductions. There was no site parking available for everyday use and the workforce and visitors were encouraged to use public transport. Public transport routes, timetables and travel information were publicised on posters and notice boards, and staff were offered the opportunity of interest-free season ticket loans. The site was easily accessible on foot and by bike, and cycle racks and changing facilities were provided on site. Trade contractors were encouraged to ensure deliveries were managed efficiently by organising full-load or joint deliveries with other contractors. Efficient waste collection was promoted by ensuring skips were full prior to collection, simultaneously dropping off empty skips and by preferring local companies and transfer stations. The plan also involved monitoring and collating transport data to establish accurate benchmark targets and develop more efficient site practices in the future.

Construction carbon footprint

A pioneering study was conducted in collaboration with a carbon consultancy to calculate the embodied carbon footprint of the building, including the emissions associated with the manufacture of construction materials and on-site construction operations. The total construction footprint for One Kingdom Street was 24,815 tonnes of carbon dioxide equivalent, with the steel frame and concrete works responsible for 35 percent and 18 percent of the footprint respectively. Construction materials accounted for 85 percent of the total construction carbon footprint of the building. The study constitutes a benchmark for Skanska and Development Securities to investigate potential areas for improvement on future projects.

Minimising environmental disturbance during construction

Noise, dust and traffic congestion were minimised in consideration of the site's neighbouring residents and businesses. Noise levels were monitored and construction activities were restricted to within agreed hours. Skanska maintained regular communication with site neighbours to inform of potential noise disruptions and to accommodate quiet period requests. Airborne dust was minimised by dampening construction roads with grey water during dry periods, jet-washing vehicles before leaving the site and a road sweeper was used to clean the surrounding roads. Traffic congestion surrounding the site was minimised by encouraging public transport as the preferred means to access the site and by promoting efficient deliveries and collections.

Environmentally responsible suppliers and construction materials

Each project sub contractor successfully underwent a pre approval environmental management evaluation as part of the Skanska ISO 14001 Environmental Management System. Environmentally responsible construction materials included timber certified by the Forest Stewardship Council, in accordance with Skanska's Sustainable Timber Policy.

One Kingdom Street water efficiency

Taps have flow regulators and reduction valves, and sensors ensure that urinals only flush when required. The bathrooms are also fitted with valves that stop the flow of water once the lights are switched off in order to reduce water wastage from leaking or accidentally left on taps.

Renewable energy

One Kingdom Street is equipped with geothermal and solar water heating systems. The geothermal system is built into the building's structural piles, or Energy Piles™ and produces 210 kW of heating and 85 kW of cooling for the reception, atria, the south core toilet block, the lift lobby and all staircases. The system produces approximately 5 percent of the building's total heating. The solar water heating system consists of 60 roof solar panels, which produce a maximum 350 kW of heat transfer duty through heat exchangers and buffer vessels to the hot water storage calorifiers. The system provides hot water for all washrooms, shower rooms and tea points throughout the building.

Learning From Good Practice

Skanska has excelled in the areas of sustainability by exceeding the requirements of the client in terms of the BREEAM rating, Considerate Constructors Scheme, health and safety and community relations. The sustainability work has promoted good relations with project stakeholders and the client, Development Securities, for possible projects in the future.