UK-GBC CASE STUDY - KING’S CROSS

Name: King’s Cross, London
Description: The 67 acre site has a rich history and a unique setting. A regenerated brownfield site, it is now being transformed into a new part of the city with homes, shops, offices, galleries, bars, restaurants, schools and a university. The site also comprises green infrastructure, an energy centre, as well as the conservation of heritage buildings.

Project Team: King’s Cross is owned by the King’s Cross Central Limited Partnership (comprising Argent King’s Cross Limited Partnership, DHL Supply Chain, London & Continental Railways, and Australian Super). Argent LLP is the development and asset manager.

This case study focuses on Argent’s approach to sustainable development as well as insights provided by Kier, the contractor at the Five Pancras Square project.

PROJECT HIGHLIGHTS - KEY FACTS
- 67 acres
- 50 new buildings
- 2,000 new homes
- 20 new streets
- 10 new public squares
- 3.4 m sq ft of work space
- 500,000 sq ft of retail
- 26 acres of public space (40%)

Expected 2020 Population
- 5,000 University of the Arts London students and staff
- 8,000 local residents
- 35,000 office workers
- 450,000 daily visitors

ACHIEVEMENTS TO DATE
- 59,000 sq m of public realm delivered
- Front loaded infrastructure site wide district heating network will eventually provide c.99% of heat and hot water demand
- 81% of public waste recycled with 0% direct to landfill
- 11,000 sq m of green/brown roofs completed, under development or approved by planning
- 200 m of green wall planted
- 11 heritage structures refurbished to date
- Over 4,000 school pupils welcomed to the site
- Over 450 NVQ achievers via the Construction Skills Centre

Three completed buildings (One, Two and Five Pancras Square) have achieved a BREEAM “Outstanding” rating.

Five Pancras Square achieved the highest BREEAM score for offices (97.6%) in the UK.
ARGENT’S DEFINITION OF SUSTAINABLE DEVELOPMENT:

“A development which brings lasting environmental, economic and social benefits to the project and to the wider community. Furthermore, a sustainable development is delivered and managed with consideration for optimising the use of materials and resources.”

All stakeholders were made aware of the environmental, social and economic goals from the outset, ensuring that sustainability was embedded in the project.

PRINCIPLES FOR A HUMAN CITY

Argent created a strategy document, “Principles for a Human City”, to make King’s Cross a destination within the city and to create a lasting place for people.

To achieve these aims, it was important to focus on:

- The spaces in between buildings, the site’s connectivity and how it enables social interaction and engagement with the community
- Recognising the health and wellbeing impacts of buildings
- Long term effects including working with occupiers so that buildings are managed appropriately and efficiently to achieve high performance targets

PLANNING REQUIREMENTS

These included legally binding environmental, social and financial commitments such as BREEAM Very Good as a minimum standard on all buildings, renewable energy targets, carbon savings, protection of some of the heritage buildings, conserved and enhanced habitats, public space, community facilities, and a minimum number of homes and jobs created.

BREEAM

Argent is working with the design teams, contractors and occupiers to go beyond the minimum requirements and is targeting BREEAM Excellent at a site level with aspirations for BREEAM Outstanding on particular buildings.

ENERGY

GOAL:
Achieve 60 per cent carbon reduction by 2050, from 2000 levels, across all buildings.

To meet this challenge, Argent has prioritised good design with an optimally oriented building with an energy efficient building fabric, followed by good asset management, then energy supply systems.

LIFECYCLE CARBON

To understand the full carbon impact of King’s Cross, Sturgis Carbon Profiling was appointed to undertake a lifecycle carbon footprint assessment, including assessing occupier behaviour. The exercise provided a tool to identify the opportunities to influence the footprint and created a programme of learning around how to reduce carbon throughout the lifecycle.

EMBODIED CARBON

The lifecycle carbon exercise meant that Argent could improve its understanding of how to reduce embodied carbon but identified that it must be done early enough in the process to be able to influence change.

Lessons Learnt:

1. Reducing embodied carbon does not necessarily cost the client more as long as it is considered at the very start of the project, preferably before a pre-let contract.
2. The whole building lifecycle must be considered. Low embodied carbon buildings are often more temporary or have short lifespans. The legacy issues embedded in the development required buildings with long lifespans that could be changed and repurposed to new tenants. This objective is at cross purposes to low embodied carbon objectives. Argent is working towards finding the “sweet spot” on the embodied carbon curve which balances embodied carbon reductions against a longer building lifecycle.
3. Reducing embodied carbon requires several important steps:
   - It must be specified within the brief
   - Understanding and educating contractors and operatives
   - An embodied carbon champion is needed to encourage the project team towards embodied carbon reductions as well as provide realistic solutions e.g. safeguarding long lead times.

ENERGY EFFICIENCY IN BUILDING DESIGN

BREEAM targets are a key driver of the expected building energy performance. BREEAM Excellent is the site target and BREEAM Outstanding is the aspiration for particular buildings. At Five Pancras Square the overall design strategy took a fabric first approach and used passive measures to achieve high levels of energy efficiency.

At Five Pancras Square, the tenant, London Borough of Camden, reduced the estate’s carbon footprint by 64 per cent through the relocation, condensing 11 buildings into four. It has reviewed the space requirements and reduced the ratio of seven desks per 10 people to 6.5 desks per 10 people. Lighting within the office building is through passive infrared (PIR) LEDs as standard.
RENEWABLE ENERGY

King's Cross has also incorporated onsite renewables through solar PV array with an expected installed capacity of 200,000 kWh.

LESSONS LEARNT:

- It does not create a “green premium” for assets
- Some occupiers do not value low carbon energy generation
- Front loaded capital expenditure
- Associated space savings in buildings

LOW CARBON ENERGY GENERATION

The site's brownfield status facilitated the decision to take a site wide district heating approach. Whilst the business case wasn't established at the start, Argent kept an open mind and a long term perspective. Recognition of the long term benefits for the local area were prioritised over the short term wins for individual buildings.

The district heating system, located in the Tapestry Building Energy Centre, will comprise three CHP engines with a thermal capacity of 26MW. Biomass boilers and a fuel cell are planned for later stages of the project.

Advantages:
- Facilitating higher levels of BREEAM
- Opportunities to export heat
- Associated space savings in buildings

Challenges:
- Front loaded capital expenditure
- Some occupiers do not value low carbon energy generation
- It does not create a “green premium” for assets

Lessons Learnt: Technological barriers which affected the feasibility of district cooling made a side wide solution unfeasible. Also, assessments of how site-wide systems affect the liquidity of each asset are vital. Alternative technologies for smaller areas are proposed such as cooling pod technology for later phases.

ASSET MANAGEMENT

The Estates Team at King's Cross have committed to undertaking a seasonal commissioning programme across all the managed buildings to maintain a high level of energy performance. Argent has identified key intervention points throughout the building lifecycle where it could impact on the performance of the buildings. One of these points is working with occupiers in order to commit to managing the buildings effectively. An Occupiers Environmental Forum has been established to bring together interested tenants to discuss how they may manage their operational and employee impacts. In addition, an energy management programme is being developed to benchmark all site buildings and collect commissioning and operational energy data. A post-occupancy programme is being established to ensure that buildings operate at designed energy performance levels.

WASTE & MATERIALS

GOAL: The disposal of waste to be managed to maximise the environmental and development benefits from the use of surplus material and to minimise any adverse effects of disposal.

RESPONSIBLE SOURCING

On the Five Pancras Square project, 98 per cent of the materials handled on site were responsibly sourced. Key to achieving this was ensuring that the supply chain was engaged from a very early point and responsible sourcing was included within orders. All subcontractors were certified to ISO 140001 and individual materials were covered by BES 6001 (aggregates), CARES (steel) and FSC (timber).

REDUCTION AND RECYCLING

At a site level, over 80 per cent of the waste generated by construction and in the public areas is being recycled. The remaining 20 per cent is food waste which is sent for anaerobic digestion and composting. Any non-recyclables are sent for incineration and energy recovery.

A King's Cross SMARTWaste database collates all construction environmental data. This enables comparison between sites and contractors to maximise the amount of waste being reduced and recycled. During the construction stage at Five Pancras Square, the proportion of construction waste diverted from landfill 2008-2013 was 76 per cent.

At an operational level, the site has now been certified to ISO14001 and a mini-MRF (Materials Recovery Facility) has been installed which enables onsite segregation and recycling.

WATER

GOAL: Prevent flooding and respond to the risk of a 1:100 year flooding event.

URBAN DRAINAGE

Argent worked with the water company to manage the expected flow rates based on the green infrastructure installed. In addition to the improvement of the existing waterways, there are planned natural ponds as well as 11,000 sq m of green roofs and a 200 m green wall. This large amount of green infrastructure on the development, in the form of parks, urban trees and canal-side planting, will minimise the amount of rainwater runoff into the sewer network.

WATER EFFICIENCY IN BUILDINGS

At a building level, water efficiency has also been considered with rainwater and grey water harvesting included in building design. At Five Pancras Square, Camden Borough Council is also using waterless urinals, giving water savings of 1,500 litres/day.
**GOAL:** Biodiversity enhancements through a “living landscape” approach.

Green infrastructure is key to going beyond the BREEAM biodiversity requirements. Argent is taking a “living landscape” approach to roofs, connecting into green corridors and green spaces. In collaboration with the London Wildlife Trust, biodiversity, water quality and habitat improvements are being monitored through snapshot surveys. The Trust also identified opportunities for biodiversity enhancements, as well as ensuring that impacts on waterways, especially during the construction phase, are minimised.

Global Generation and their Generators (adolescents aged 15-17) are also supporting the site biodiversity goals. Building on the Trust’s recommendations to enhance the roofs, the Generators are learning about environmental issues, business and sustainability, and how to bring them together. Through photography and blogs based on their interventions further contact is created between locals, teenagers, businesses, Global Generation and the site. See more here.

**COMMUNITY ENGAGEMENT**

**GOAL:** Forge partnerships with local groups and enable occupiers and visitors to get involved in meaningful community engagement.

One of the main vehicles that has fostered community engagement is the Global Generation Skip Garden. The Skip Garden is an urban garden made out of moveable skips. It cultivates a range of plants such as edible crops, greenhouse plants, herbs, dye plants, medicinal plants, fruit trees and has bee hives and wormeries. The Skip Garden has placed co-creation at the centre of its community engagement strategy and created a vehicle that business, construction, development and activism could interact with. It has given rise to collaborations between the onsite contractors, local residents and visitors, and provides a hub for reclaimed materials from sites that would be wasted. Over 2,500 children have visited the Skip Garden to learn about sustainable urban gardening. The Skip Garden has also informed aspects of the site biodiversity policy: tenants who request planters outside their buildings with the support of Global Generation are planting species that encourage pollinating insects.

Argent has also created a series of initiatives to engage with children on the site including a “King’s Cross Detectives” programme with more than 1,000 school children participating and a kid’s stand-up comedy event.

Click here for Resources for Schools, Children’s Poetry Trail and The House of Illustration.

**SKILLS, BUSINESS & LOCAL ECONOMY**

**GOAL:** Ensure the new estate is at the heart of a revitalised local economy, at a number of different scales and with a variety of sectors, offering opportunities to the local supply chain.

The Construction Skills Centre, KX Recruit and the King’s Cross and St Pancras Business Partnership (KXSP) all form part of an over-arching programme to improve socio-economic opportunities for local people. The programmes have had great success in giving qualifications, training and employment, however, it has not been without challenges. The limited pool of applicants in the area, coupled with the challenge of young apprentices who have to gain a qualification within current construction practices, has led to Argent remodelling the provision of skills and training with local authorities in order to focus on quality rather than quantity.

For more information on the King’s Cross recruitment activities click here.

**CONCLUSION**

King’s Cross is a great example of a project where public realm and placemaking have taken priority and resulted in turning a formerly derelict and undervalued area into a destination within London. The full extent of the environmental and social outcomes are yet to be seen until the site completes in 2020, however, King’s Cross fulfils much of Argent’s original vision of a sustainable development.