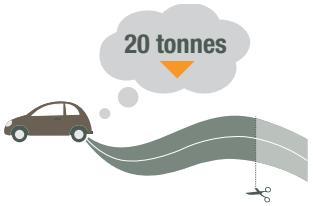
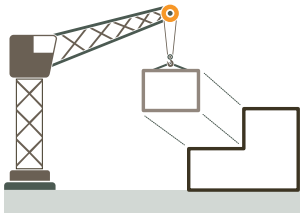
BREEAM Very Good
and EPC B rated



WebEx online meetings saved
20 tonnes of CO_2



Prefabrication reduced waste on site

Rainwater harvested
during construction

CASE STUDY: LEEDS ARENA

One of the most sustainable arenas in the UK, set to host more than 140 events each year from rock concerts to ice dancing. With a capacity of 13,500 people, the 30,000m² venue also provides 4,000m² of public space and a 100-seat restaurant.

SUSTAINABLE DESIGN

The customer specified a sustainable approach to the arena and we managed to achieve a BREEAM Very Good at design stage and EPC rating B. Key to making the Leeds Arena sustainable was the use of BIM which allowed us to 'build it twice' – once in 3D and then in reality on-site. This drives efficiency as any clashes in the schedule are visualised before construction begins. BIM identifies risk detection and enables the integration of the supply chain with the design and site teams.

We were able to draw from the experience of BAM Stadia, based in Germany, a subsidiary of Royal BAM Group that specialises in building arenas and stadiums all around the world. Collaborating with colleagues who have relevant experience allowed us to proceed with the project knowing advice was always available.

A multi-skinned envelope and a double layered acoustically sealed roof prevents noise disturbing nearby residents- the arena is quieter than the ambient noise assessments taken on site. The front of the building incorporates LED lighting which changes colour dependent on the show.

TACKLING CLIMATE CHANGE

During construction we used efficient open plan cabins complete with double glazing, additional insulation (which we retrofitted) timed heaters, and efficient water heaters to reduce energy use on site. All site lighting and heating was also on timers to avoid any energy being wasted.

We used our remote metering system to monitor all energy consumption allowing us to identify where energy was being used and target areas for reduction. We also installed a substation early on in the project so that we could use mains power rather than generators, which are less efficient.

RESOURCE EFFICIENCY

The site team implemented strong leadership to drive waste reduction and achieve three BREEAM waste credits (achieving less than 9.2m³ of waste per 100m² floor area). Consultation with each subcontractor at the pre-start stage ensured they were aware of the overall aim and each was allocated a target number of skips.

Many aspects of the building were prefabricated, which reduced the amount of waste produced on-site, the number of transport miles travelled, and the amount of work at height required. These included the electrical containment baskets, decking, all terracing sections and concrete walling sections. To further reduce waste, racking

'BAM'S EFFORTS HAVE SEEN THE SUCCESSFUL DELIVERY OF A HIGH QUALITY AND UNIQUE DESIGN THAT HAS WON PLAUDITS FROM STAKEHOLDERS SUCH AS CABE AND THE CIVIC TRUST, AND CONTINUES TO RECEIVE EXCELLENT FEEDBACK FROM MEDIA AND THE LOCAL COMMUNITIES.'

Chris Coulson, Executive Officer,
Asset Management Division,
Leeds City Council

Completed: **March 2013**
Customer: **Leeds City Council**
Architects: **Populous**
Mechanical & Electrical consultants: **Arup**
Structural Engineer: **Arup**
Project Manager: **Davis Langdon**
Quantity Surveyor: **Davis Langdon**

Green roof encourages local biodiversity as well as attenuating stormwater

Training event gained ten new local based subcontractors

Amount raised from mega raffle for Macmillan Cancer Support

3 silver CCS awards

was provided for the plumbers to store whole pipes and off-cuts. This prevented damage and also promoted the use of pipe off-cuts.

We used 6F2 recycled aggregates for the piling mat. Sections of blockwork and concrete which had to be removed due to design changes were also retained on site and used as aggregate. A specific cutting area was created for the dryliners so that they could store plasterboard off-cuts and reuse these in the air conditioning pathways.

Triple boarding, which uses three layers of insulation boards, was used to achieve the correct acoustics of the building. We reused off-cuts of insulation board between the two outer layers.

WATER MANAGEMENT

Storm water is collected in an attenuation tank made from recycled plastics, which slowly release the water, preventing flooding during periods of high rainfall. Rainwater was also harvested during construction and used for jet washing vehicles and damping down dust during dry spells.

BIODIVERSITY

Before any construction work began an ecological study was carried out and found Japanese knotweed on site, which was eradicated by a specialist sub-contractor.
A green roof was installed to provide ecological benefit as well as attenuating stormwater. To further improve biodiversity at the site, wild flower seeds were planted on the landscape bunds.
The temporary site hoarding was also arranged in a way to prevent damage to trees that were protected by Tree Protection Orders.

SOURCING RESPONSIBLY

We hosted an event to give local subcontractors the opportunity to work with us. Companies completed questionnaires to ascertain if they met our standards and our Regional Supply Chain Manager advised them on how to further improve their procedures. We now have a further ten West Yorkshire based subcontractors that meet our standards.

COMMUNITY ENGAGEMENT

Leeds Arena acted as a local hub for construction training, with 86 employees gaining new skills and qualifications during their time on site. We successfully supported 83 existing apprentices and a further 22 new apprentices were recruited as a result of the project. In recognition of our efforts on site, we won two awards at the Leeds Apprenticeship Awards.

To support our national commitment to enhancing the curriculum over 1,000 students were engaged in the project, with 15 students offered on site work placements. The project also supported three university research projects.

Our team created a community garden for local social enterprise, Shine. The project provided 90 weeks of work experience and construction training to 25 unemployed people, 12 of whom worked on the project for the duration. As a result, three volunteers have been employed on BAM sites, one was employed by another contractor and a further eight went into training.

In total our site team gave 1,658 hours towards community initiatives.

HEALTH AND WELLBEING

An occupational health nurse was on site and provided a drop-in facility for operatives to discuss any health concerns. This was supported by toolbox talks regarding health issues on site, as well as supplementary information supplied on site noticeboards.

Through this and many other initiatives, we managed to achieve high Considerate Constructors Scheme (CCS) scores of 37 out of 40 (old scheme), 43 out of 50 (new scheme) and won three silver CCS awards.