

Supply of sustainable concrete at the London Olympics

OLYMPIC DELIVERY AUTHORITY, ENGLAND

Procurement objectives

The London bid to host the 2012 Games set out a plan for how the Games could play a major role in the revitalisation of east London. Equally important was to achieve this in a sustainable manner, provide value for money, and to leave a lasting legacy for east London.

The Olympic Delivery Authority's (ODA) central job was to deliver venues, facilities and infrastructure and transport in a way that 'maximised the delivery of sustainable objectives, on time and within the available budget'. In order to set out the key policy priorities to reach these goals, the Olympic Board published the London 2012 Sustainability Policy in 2006. This set out five 'headline themes' as key policy areas, which were:

- Climate change;
- Waste;
- Biodiversity;
- Healthy living; and
- Inclusion.

These represented the priority sustainability themes across the entire London 2012 programme (including venues outside of London) and formed the basis of strategies and action plans.

Criteria used

Subject matter of the contract:

Supply of concrete for the Olympic Park

Technical specifications:

The ODA required tenderers to ensure that they either meet or exceed the following targets:

- Ensure that, as a minimum, construction materials (by value) are comprised of at least 20 percent recycled content;
- Ensure that 25 percent of aggregate used will be recycled;
- Transport 50 percent of materials (by weight) to the site by sustainable means i.e. water or rail;
- Use energy-efficient, low-emissions vehicles on-site.

The company was also required to build a batching plant and carry out site-wide delivery in order to reduce the number of vehicles delivering to the site.

Background

From the outset, the ODA set challenging sustainability targets for all projects on the Park, which were outlined in the 2007 [Sustainable Development Strategy](#). For the procurement of materials for the Olympic Park, the ODA aimed to identify, source and use environmentally responsible materials. To attain these goals, the ODA identified four principle sustainability considerations:

- Responsible sourcing;
- Use of secondary materials;
- Minimising embodied impacts; and
- Healthy materials.

Initial estimates made for the Park indicated that 500 000m³ of ready-mix concrete would be required to build both the sporting venues and supporting infrastructure with an equivalent aggregate requirement of approximately 1 million tonnes.



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Results

Initial estimates of concrete use on the Olympic Park indicated a requirement for 500 000m³ of ready mixed concrete and an equivalent aggregate requirement of 1 million tonnes. The ODA worked with the concrete supplier and engaged with the supply chain to develop sustainable concrete mixes. This resulted in the use of approximately 170 000 tonnes (almost 22 per cent) of recycled and secondary aggregate. Rationalisation and efficiency of design reduced concrete demand by 65 000m³, saving a further 120 000 tonnes of aggregate. The innovation of the Park planners, engineers, contractors and their supply chain eliminated the quarrying of over 289 000 tonnes of primary material. It also saved more than 46 500 tonnes of CO₂, which is equivalent to almost six years of the Park's operation.

Environmental impacts

The use of recycled and secondary aggregate led to savings of approximately 30 000 tonnes (24 percent) of embodied CO₂ and the elimination of over 70 000 road vehicle movements. The reduction of concrete use through efficient design led to a further savings of 20 000 tonnes of embodied CO₂.

Lessons learned

Centralised procurement, early supply chain integration and extensive testing of various sustainable concrete mixes, were key in reducing the overall environmental impact of concrete on the Park. It was also clear that delivering sustainable concrete requires a client with strong sustainability ambitions, the availability of a sustainable concrete supplier and supply chain, and designers and contractors who are knowledgeable in sustainable design and development.

The benefits of forecasting material use within a construction project were also found to be significant. Understanding concrete and aggregate needs at the early design stage enabled the production of clear specifications that would meet sustainability objectives. Early clarity on material demands and requirements allowed designers and contractors to take a proactive approach to reach targets while an on-going review enabled contractors to employ remedial action as necessary.