CONCRETE USAGE IN THE LONDON 2012 OLYMPIC PARK AND THE OLYMPIC AND PARALYMPIC VILLAGE AND ITS EMBODIED CARBON CONTENT

Stuart Matthews
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Cover images:
Main: ???
Top right: Aerial view of the 2012 Olympic Park and Olympic and Paralympic Village during construction
Middle right: Side view of the diving boards in the Aquatics Centre
Bottom right: Detail of one of the residential blocks in the Olympic and Paralympic Village
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Concrete is widely used in the Olympic Park and Olympic and Paralympic Village. Its specification and use provided an important opportunity to reduce embodied carbon emissions involved in the creation of facilities and infrastructure, as well as to influence the overall carbon footprint of the London 2012 Games.

The Olympic Delivery Authority initiated a concrete supply strategy that included requirements to: achieve sustainability targets; appoint single concrete suppliers for the Olympic Park and Olympic and Paralympic Village; source via two on-site batching plants; work with the supply chain to minimise transport impacts; use secondary/recycled aggregates; and incorporate fly ash and ground granulated blastfurnace slag as Portland cement replacements in the concretes used.

Across the Olympic Park as a whole, it is estimated that the embodied carbon footprint of the concrete mixes supplied has been reduced by 33% relative to the UK construction industry average. This BRE Trust Report sets out the evidence on concrete supply to the Olympic Park and the Olympic and Paralympic Village, lessons learned from the experience of using sustainable concretes and examines the estimated carbon footprints. Case studies of the Aquatics Centre and the Olympic and Paralympic Village are included.

IHS BRE Press has published two other publications relating to sustainable construction of the London 2012 Games. These are:
- *BREEAM and the Code for Sustainable Homes on the London 2012 Olympic Park* (FB 47)
- *Innovation in timber supply at the London 2012 Olympic and Paralympic Games* (IP 17/12)

Summaries of these reports have been published on the Learning Legacy website together with many other reports and case studies (http://learninglegacy.london2012.com).


1 INTRODUCTION TO THE PRIORITY SUSTAINABILITY THEMES OF THE LONDON 2012 OLYMPIC AND PARALYMPIC GAMES

When London won the right in 2005 to host the London 2012 Olympic and Paralympic Games, the bid team pledged to set the highest possible standards in sustainability. This will be the first summer Games to map its complete carbon footprint over the entire project.

The London Games’ mission statement is: ‘To minimise the carbon footprint of the Games and provide a platform for demonstrating long-term solutions for energy and water resource management, infrastructure development, transport, local and seasonal food production and carbon impact mitigation and adaptation.’

To help it deliver on its pledge, the Olympic Delivery Authority (ODA) adopted the principles of ‘One Planet Living’ as the basis for its London 2012 Sustainability Plan (‘Towards a One Planet 2012’). The ‘One Planet Living’ approach was developed by green campaign groups BioRegional and WWF and is based on the efficient use of natural resources.

Construction activity for the 2012 Games (Figure 1) is guided by six core priority sustainability themes: reducing carbon emissions; minimising water use; minimising waste; sourcing sustainable materials; retaining biodiversity and enhancing it where possible; and minimising overall environmental impact. These principles were applied across the Games’ landmark venues and all other development, including the Olympic and Paralympic Village that will house athletes and officials, the 30 bridges and other infrastructure provided, and the landscaping.

For the Olympic Park site in Stratford, east London, the ODA made specific commitments to:

- achieve a 50% reduction in carbon emissions from permanent buildings on the Olympic Park (compared with notional buildings built to the Building Regulations 2000 (as amended[1]) by 2013
- supply 20% of the energy used on the Olympic Park after the Games from on-site renewable sources
- freight 50%, by weight, of construction materials for the Olympic Park by rail or river
- reduce the amount of potable water used in new permanent venues by 40% (against 2006 standards) by using water-efficient appliances and non-potable water for irrigation.

The ODA also made a commitment that permanent buildings would achieve a Building Research Establishment Environmental Assessment Method (BREEAM; see www.breeam.org) ‘Excellent’ rating, after the Games[4, 5]. To take this forward it was necessary for the ODA and BRE to work together to develop a bespoke version of BREEAM that could be applied to both the sport venues and the Park itself.

The ODA's delivery against its objectives has been monitored by an independent body, The Commission for a Sustainable London 2012, which reports on a regular basis (see http://www.cslondon.org).

Figure 1: Aerial view of the 2012 Olympic Park and Olympic and Paralympic Village during construction