

BREEAM AND THE CODE FOR SUSTAINABLE HOMES ON THE LONDON 2012 OLYMPIC PARK

Lessons from the Velodrome, Aquatics Centre and the Olympic and Paralympic Village

Neil Paterson, Adam Robinson and Robin Brylewski



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- built facilities that offer improved functionality and value for money
- a more efficient and sustainable construction sector, with
- a higher level of innovative practice.

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Cover images:

Main: Aerial view of the Olympic Park looking south towards Canary Wharf, April 2012

Top right: The Aquatics Centre approaching completion

Middle right: The completed Velodrome

Bottom right: The Olympic and Paralympic Village

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PREFACE

Four projects were funded by BRE Trust relating to the London 2012 Olympic Park. They aimed to contribute to the 'learning legacy' for the Games and to share the lessons learned about sustainable design and construction more widely with the UK construction industry.

Two of the projects examine the achievement of high levels of sustainability: the use of the Building Research Establishment Environmental Assessment Method (BREEAM) in the design and construction of the Velodrome and Aquatics Centre; and the use of the Code for Sustainable Homes on the Olympic and Paralympic Village. The findings of these projects will be especially valuable to clients, designers and contractors, and so these are published together as the two parts of this BRE Trust report.

Two further projects relate to materials supply and construction and will be of most interest to contractors and suppliers in the timber and concrete supply chain. These are therefore being published separately:

- *Innovation in timber supply at the London 2012 Olympic and Paralympic Games* by Ed Suttie is to be published as a BRE Information Paper.
- *Concrete usage in the 2012 Olympic Park and the Olympic and Paralympic Village and its embodied carbon content* by Stuart Matthews is to be published as a separate BRE Trust report.

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

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The Olympic Park under development in Stratford, east London

PART ONE

AIMING FOR 'EXCELLENT': THE DEVELOPMENT AND USE OF BREEAM ASSESSMENTS FOR THE OLYMPIC PARK VENUES



The Aquatics Centre was designed by Zaha Hadid Architects

EXECUTIVE SUMMARY

When London won the right to host the London 2012 Olympic and Paralympic Games in 2005, the bid team pledged to treat sustainability as a major priority. The Olympic Delivery Authority (ODA) aimed to establish sustainability benchmarks for the design and construction of the major sporting facilities and the surrounding Olympic Park that were above industry standard.

One tool trialled to support the achievement of these objectives was a new version of the Building Research Establishment Environmental Assessment Method (BREEAM). BREEAM is a well-established means of assessing the sustainability of a range of different types of new and existing buildings. However, this was the first time that assessments were created and used for major sports stadia.

This report explains why BREEAM was selected and how a bespoke version was developed and applied. Particular reference is made to two of the major venues: the Aquatics Centre and the Velodrome. A number of issues are considered:

- how BREEAM was adapted to suit the London 2012 Games and then implemented
- whether all of the important sustainability considerations were measured and appropriately rewarded
- how flexible the methodology was in dealing with the different building types
- the extent to which BREEAM has driven or improved the sustainability of the buildings.

The experience has produced important lessons for industry about how to obtain the maximum benefit from an assessment, with specific lessons for other major events.



The Velodrome was designed by Hopkins Architects Partnership

1 INTRODUCTION

When London won the right to host the London 2012 Olympic and Paralympic Games in 2005, the bid team pledged to treat sustainability as a major priority. London 2012 will be the first summer Games to map its complete carbon footprint over the entire project. The ODA aimed to establish sustainability benchmarks for the development of future Games facilities, and to take a lead in best practice that others in UK construction will follow. Many sustainability targets were set and these were enshrined in the ODA's Sustainable Development Strategy^[1].

One tool trialled to support these objectives was a new version of BREEAM. Developed and managed in the UK by BRE Global, BREEAM was first used in 1990. It is now a well-established means of assessing the sustainability of a range of different types of new and existing buildings. This was the first time there was an opportunity for assessments to be created and used for major sports stadia. The intention was to develop a bespoke BREEAM scheme in order to drive reductions in environmental impacts and measure these robustly.

1.1 WHAT IS BREEAM?

BREEAM is used across the world and is a leading environmental assessment method for new and existing buildings, with more than 200,000 buildings certified and more than one million registered.

The performance of buildings is assessed across 10 sustainability categories: Management; Health & Wellbeing; Energy; Transport; Water; Materials; Waste; Land Use & Ecology; Pollution; and Innovation. A given number of credits are available for addressing each issue*. The issues seek to mitigate the impact of a new or refurbished building on the environment by setting performance-based criteria and benchmarks. Where evidence is provided demonstrating that the criteria have been met, the appropriate number of credits can be awarded. A weighting is applied to account for the varying importance of the different categories and then

the category totals are added together to produce a single overall rating on a scale of 'Pass', 'Good', 'Very Good' or 'Excellent'. Since 2008, the standard schemes have included a top rating of 'Outstanding', but at the time that the bespoke Olympic scheme was developed 'Excellent' was the highest rating available.

The operation of BREEAM is overseen by an independent governing body and a standing panel for peer and market review. The governing body represents stakeholder interests to ensure, among other things, that BRE Global Ltd, and therefore BREEAM, is acting independently and impartially.

The authors of this report are not associated with the BREEAM team at BRE Global and have prepared this report independently.

1.2 WHY WAS BREEAM SELECTED FOR THE LONDON 2012 GAMES?

The ODA selected BREEAM for several reasons:

- Using a tailored version of BREEAM provided the ODA with a method for benchmarking the sustainability impacts of the venues, accounting for and consistent with the objectives of its Sustainable Development Strategy.
- BREEAM is an independently managed tool and could be externally audited.
- Basing assessments on BREEAM provided reassurance that the method would build upon the tried and tested approach inherent in the existing BREEAM standards.

The choice of BREEAM also provided a means for the planning authority to place a condition on development. This required the ODA to use reasonable endeavours to achieve a BREEAM Excellent rating on the permanent venues.

It should be noted that while the Sustainable Development Strategy incorporates a requirement for BREEAM, this is only one of the many sustainability considerations that the design teams and contractors had to address. Complementary targets were set for key areas such as energy efficiency, water use, construction waste and materials.

* Each category comprises a number of related issues. For example, the Energy category comprises eight issues including E1 'Reduction of emissions', E4 'External lighting' and E22 'Pool ventilation and heat loss'.

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Two of the projects examine the achievement of high levels of sustainability on two of the key venues at the Park: the use of the Building Research Establishment Environmental Assessment Method (BREEAM) in the design and construction of the Velodrome and Aquatics Centre; and the use of the Code for Sustainable Homes on the Olympic and Paralympic Village. The findings of these projects will be especially valuable to clients, designers and contractors, and so these are published together as the two parts of this BRE Trust report.

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