

Regeneration of previously developed land

London Olympic Park: improving environmental and human health benefits through brownfield land regeneration to green space

Introduction

A potential benefit of regenerating brownfield sites to urban green space is that it can act as a catalyst for neighbourhood renewal, as was the case for the site chosen to host the London 2012 Olympic Games and Olympic Park. The site selected as the main focus for key infrastructure will house the new Olympic Stadium (seating around 75 000 people), aqua-park and velodrome. Costing £9.3 billion across 2.5 km², the enabling works were a three-year programme involving demolition of 190 buildings, construction of 30 new bridges and soil washing over 600 000 t soil.

The environmental and human health benefits from the work include cleaning up soil and groundwater, through reduced soil contamination. Once the site is created, it will also provide benefits in the form of new green infrastructure, with over 100 ha of green space, including the Olympic Park and areas of wildlife habitat.



A vision of the Olympic Park (courtesy London 2012).

History

Through the Olympic Development Agency (ODA), the enabling works cleaned up an area of East London which was heavily contaminated as a result of former industrial activity. Previous uses since Victorian times included: landfilling, soap factory, gas works, the Hudson Bay Fur deposit, and a number of heavy industrial operations. The vision of the games was to regenerate the site and leave a legacy for London in the form of a park which could be enjoyed for generations to come and provide London with new green space.

Materials and Methods

Study area

Located in Stratford, north of the River Thames, the site is intersected by the lower sections of the River Lee and Lee Navigation. The site became heavily contaminated as a result of historic activities and contained materials disposed of during the industrial revolution and through industrial work. The site was contaminated with a wide range of organic materials and heavy metals.

Method

The clean up operations were set out in the original Olympic bid submitted in 2004, and it has been noted that the innovatively designed legacy programme helped win the favour of the judges when selecting London over other cities. The new park is proposed as a multi-purpose, high quality, open space, forging links to other green space in London.

Contaminants of most concern included heavy metals in the form of lead, arsenic and chromium, as well as organics (such as fuel oil, tar and bitumen), ammonia and localised chlorinated hydrocarbons. Remedial options were assessed and refined, and involved the removal of contaminated soil hotspots, as well as groundwater remediation extending down to the river alluvium. Improvement of soil quality through the enabling works involved a wide range of remediation techniques and technologies, including soil washing, biopiles and bioremediation.

The waterways are considered key to the future legacy development of the area. Work to improve river, canal and groundwater quality on over 3 km of waterways started in 2007. Groundwater remediation included groundwater dewatering and dual-phase extraction which has already led to habitat improvements. In the later stages this will improve filtration and help with flood alleviation. While the benefits of the regeneration mega-project occur through the transition of the site, it is apparent that there will be a number of secondary benefits from creating the Olympic Park. These include improvements to air quality and temperature and to visual aspects through the planting of 4000 trees.

Parkland designs are still in their infancy, although a nursery was set up for species such as hazel whips during the enabling works. Vegetation trials and some planting also took place on site during these works. By 2010, the first of 4000 semi-mature trees have already been planted on site, with all of the trees grown in the UK (Epstein, 2009). Vegetation management will be fully developed during the main stages of site delivery. Hackney Wick will be developed after 2012. All the green infrastructure will be in place by 2025.

Results

The enabling works closed in November 2009, allowing the ODA to proceed with installing the games infrastructure. Sustainability was considered when the soil treatments were selected and helped guide the management of the remediation process. The works have won awards for their sustainable approaches to remediating the site.

The sustainability drivers behind the Olympic Games and Olympic Park are multi-disciplinary and the ODA worked with planning teams to ensure section 106 agreements were met. Environmental health benefits have been delivered through high-level commitments for sustainability requirements, such as a 50% reduction in carbon emissions. To help meet this target, 50% of materials were delivered by rail and water, which also minimised the impact of transport emissions on local air quality and supported secondary environmental benefits such as reduced noise pollution.

Sustainability requirements also included 20% reduction in carbon emissions from on-site renewables, 90% of materials from demolition to be reused or recycled and 40% reduction in potable water use. The project is aiming to achieve the Building Research Establishment Environmental Assessment Method (BREEAM) standards of excellence on buildings. Another benefit of the project will be habitat connectivity, extending the network of London's green space: the Olympic Park will connect to areas such as Hackney Wick and Leightonstone. Secondary human health benefits from the GI include recreation opportunities and improved landscapes.

Conclusion

This study shows that, to date, regeneration work on the Olympic Site has improved the environmental quality across a large area of east London, driven by a high profile partnership and a large injection of funds. Further to the extensive benefits delivered through the enabling works, the environmental health benefits are set to continue to increase after the games have been held. The plans for the legacy phase involve further development of the site to extend wildlife habitats and plant native species, connect green spaces across London and alleviate flood risk from high rainfall events. Secondary benefits from the area are predicted to include improved air quality.

The environmental benefits have been increased by the scale of the project, which is considerable. The Olympic Site has experienced a high profile, and has received substantial funding, resources and expertise in recognition of the importance of the event. The 102 ha park will transform the area and deliver extensive benefits to the environment, both in terms of scale and longevity.

Reference

Epstein, D. and Hellings, J. (2010). CL:AIRE Inaugural Lecture Delivering the Olympic Park Enabling Works. November 2009, London.