

Case Study:
Gunpowder Park
Ecological Land
Reclamation

Lee Valley Regional Park: Gunpowder Park
 Derelict Polluted Land, 110 acre Park & Nature Reserve
 New Field & Arts Centre, Completed 2004/5




Gunpowder Park
Lee Valley Regional Park

- Former Royal Ordnance Site, Waltham Abbey
- Historical significance
- Polluted site
- New 110 acre Public Park
- A new earth shelter building: 'Field Station' with studio facilities for art & science programme

Lee Valley Gunpowder Park
Brownfield Remediation
Public Park, Nature reserve
A new Field Station

The Brief

- Environmental considerations of fundamental importance throughout the development & implementation.
- Every aspect of design reflects desire to ensure minimum environmental damage occurs
- whilst establishing long-term environmental benefit.

- Sustainable use & maintenance of materials;
- Use of waste clay to create landscapes avoiding landfill
- Minimise use of valuable & scarce top soil, using clay & subsoil instead
- Use of recycled sewage waste to provide a nutrient source for plants
- Use of recycled crushed building materials for paving bases rather than quarried stones & gravel's

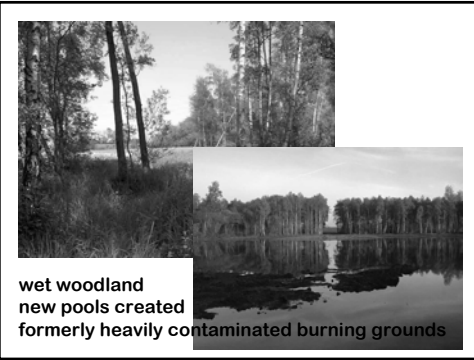
'Sustainable Urban
Drainage System
 car park providing water
 for flushing in public toilets'

- Seek local solutions to materials provision to minimise transportation on the road network with all the associated pollution and congestion
- Established fundamental goals related to long-term environmental improvement
- Undertook significant reclamation to transform publicly inaccessible industrial site into 110 hectare public park

A new earth shelter building:
'Field Station' with
studio facilities for
art & science programme



- Set biodiversity targets to benefit wildlife & achieve Biodiversity Action Plan
- Use native & British provenance trees & seed stock to maximise wildlife value
- Plant 50,000 trees, sow 35 hectares of grasslands for people & wildlife,
- Plant hedges, woodlands, field margins, wildlife crops & stream margins.



wet woodland
new pools created
formerly heavily contaminated burning grounds

- Management to protect & improve existing habitats
- Establish network of access routes for pedestrians, cyclists & horse riders to other sites without resorting to motor vehicles
- Arts & educational programme to highlight environmental issues, raise awareness & demonstrate the Authority's commitment to sustainability & environmental best practice.



Introduction

- This project is a remarkable case of sustainable construction.
- The integrated team of client, consultants, artists and contractors have transformed a barren 90 ha brown field site into an exemplar high quality Park for the 21st Century where the public and wildlife can thrive.
- The Park offers a base for collaborative arts and sciences projects to work in and interpret the site through demonstrations, exhibitions and events. (67)

Project purpose

- From 1887 to 1991 the site was used for research, development and manufacturing of explosives and propellants.
- Lee Valley Regional Park Authority bought the site to develop a strategic link in their system of public parks.
- In 2000 they started to transform the site for public use in line with their vision 'to develop a sustainable environment for public benefit without damaging the welfare of future generations'.
- The works comprise an earth sheltered Field Station set behind a monumental gabion wall, sculptural entrance works and car park with integrated Sustainable Urban Drainage System (SUDS), two new bridges, a weir cascade, foot, cycle and bridle paths, signage, planting and seeding set within sculptural landforms, regenerating woodland and sustainably farmed fields. (118)

Design Approach

- 'Blast Point', an abstracted 'explosion', forms the epicentre for mounds which spiral into the Park to form distinctive and memorable places inspired by the site's history.
- Native trees and shrubs, appropriate to the River Lee valley character, planted on the sculptural earth mounds emphasise their form.
- Walnuts and clumps of alders at the entrance refer to early gunpowder production techniques.
- Local grasses and wildflowers were sown and now form a diverse sward, rich in biodiversity value.



- A sculptural, gabion wall and metal canopy defines the main entrance to the Park and Field Station.
- This monumental wall, 4.5 metres high and 50 m long, is filled with recycled concrete and artwork which interprets and illustrates the site's history and provides important bat roosts.
- The Field Station is a visitor, education centre to host art events and workshops and a park ranger base.
- The building provides a multi-purpose workshop/meeting space, catering facilities, offices and WCs.
- The client brief called for a sustainable design to minimise the environmental impact of the building and the emission of greenhouse gases.
- The earth sheltered building features a green roof, integrates with the landscape setting and reflects Blast House forms which once covered the site.



Solar Design

- Carefully designed solar controls to the fully glazed west elevation allow winter sun and daylight to penetrate the multi-purpose space but minimise summer solar gain.
- This room, designed for up to 50 people, could overheat but the heavy building mass and natural ventilation provide comfortable conditions in hot weather.
- High level, east facing windows are designed to be left open to permit passive ventilation when the building is unoccupied without compromising security.
- These windows maximise natural glare free light for the workshop.
- Highly specified insulation and building controls minimise energy consumption & CO2 emissions.

Services

- SUDS and a rainwater recycling system minimise impact on the local drainage infrastructure.
- Rainwater infiltrates a porous car park surface to attenuation tanks to reduce peak run-off to watercourses and manage flood risk.
- The stored water is also used for irrigation and WC flushing.
- With waterless urinal and reduced requirements for mains water it is estimated the water use will be about a third of that for a conventional building. (362)

Construction

- The contract was carried out in partnership with the contractor and client working collaboratively in a positive, open and honest manner.

Safety

- Safety issues were addressed at the design stage by utilising a single storey structure to minimise the risks of working at height during construction.
- The construction phase was externally audited by the Considerate Contractors Scheme and received particular praise to measures taken for disabled access around the site and the environmental plan devised to protect local flora and fauna.
- Weekly safety meetings reviewed the works and the work force was encouraged to be actively involved in safety issues.
- This initiative was of great success and secured a low accident ratio.

Enterprise and ingenuity

- Prior to award of contract the contractor contributed their expertise to a value engineering exercise to agree a budget.
- Design and construction issues were resolved by the team, including the use of 'think tanks', to form solutions that satisfied all parties' requirements.

Economy

- Recycled materials were specified where appropriate. Construction waste was kept to a minimum.
- No soil arisings left site but were incorporated into the permanent works.
- Subsoil was used for all planting and most of the seeded areas.
- Rainwater recycling systems will reduce the life time costs for water supply and minimise the use of potable water.

Gunpowder Park

- This sustainable transformation of a private Ordnance site into a community Park will contribute to the economic regeneration and social inclusion of this part of North London. (241)