

Project: Cardiff International Sports Village

Location: Cardiff

Client: Cardiff County Council

Project description

Remediation, reclamation and ground improvement of a 33 hectare site to pave the way for a mixed use development.

ICE Design & Construct contract of value £16 million.

Works began on site in September 2003 and concluded in September 2005.

Introduction

The site is located on a man-made peninsular within the freshwater lake formed by the construction of the Cardiff Bay Barrage. Cardiff Bay represents an area of major regeneration in Cardiff.

Problem

The site had a history of industrial and commercial land use, including the presence of both licensed and unlicensed landfill tips, which had resulted in contamination of the site by heavy metals and hydrocarbons. Japanese Knotweed was present in parts of the site.

A sustainable remediation and ground improvement solution was required in order for the mixed use development to proceed. The site also required stabilisation of the bank which ran alongside the bay in order to maximise the developable area in that part of the site.

Solution

Taylor Woodrow co-ordinated the detailed design for the remediation, which was undertaken by Churngold Remediation and Arup. Keller Ground Engineering designed the ground improvement works and the gas & leachate barrier and Tony Gee & Partners designed the revetment system.

The project included:

- Exsitu bioremediation of 28,000m³ of hydrocarbon contaminated soil
- Insitu bioremediation of 17,000m³ soil & groundwater - The insitu bioremediation was conducted utilising electrolysis to treat ground water contamination.
- Removal of hydrocarbon free product from groundwater
- Major earthworks to relocate 300,000m³ of treated soils in line with end uses
- On-site treatment and validation of 14,000m³ of Japanese Knotweed infested soils
- Installation of a bentonite cut off wall with gas membrane and leachate drainage system to the perimeter of the landfill tip
- Dynamic & vibro-compaction of 95,000m² of disused landfill tip
- Installation of a passive gas venting system to the landfill tip
- Installation of 1600m of sheet pile revetment including anchor system at the water's edge

- Improvement of soft alluvium by use of band drains and surcharging
- Breaking out of hardstandings and the crushing, screening and reuse of arisings on site
- Use of 50,000m3 of recycled aggregate

Benefits

The project was one of the largest bioremediation operations undertaken in the UK and all hydrocarbon-contaminated soils were reused on site.

Avoiding the off-site disposal of contaminated soils resulted in a substantial cost saving, a reduction in transport movements, and the protection of scarce landfill capacity.

The project received the following awards:

- CEEQUAL Excellent (Civil Engineering Environmental Quality Assessment and Award Scheme) 2005
- Considerate Constructors Scheme Gold Award 2005

Key learnings

- Providing adequate space and time for best remediation methods facilitates significant added value.
- Remediation in winter requires significant additional measures to ensure successful progress and validation.
- Early engagement with designers and regulators resulted in innovation and ultimately successful validation.

Contact Details

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Site during reclamation project