

ARUP

Land Development and
Utility Design

END USER: Olympic Delivery Authority
CLIENT: ARUP
START DATE: 2007
COMPLETION: 2010

ARUP SCOPE:

Detailed design of the athletes village including earth works, utilities, drainage and roads. Additional requirements include non-interruption tie-in and interface with existing infrastructure and a staged approach to construction.

12d DIMENSIONS:

- Roads and Highways
- Land Development
- Drainage, Sewer and Utilities

Project Summary

The selection of London as the host of the XXX Olympiad in 2005 required it to develop large scale venues and infrastructure to hold events and house approximately 24,000 athletes.

This was a difficult task in an already crowded and developed city. The ultimate site was constrained by its surrounds including a high speed rail link, yet had to interface seamlessly with them and include additional utilities as required by the Olympic Games.

For more information

To find out more about how you can create better designs faster with the 12d Model solution for civil engineering design, visit www.12d.com.



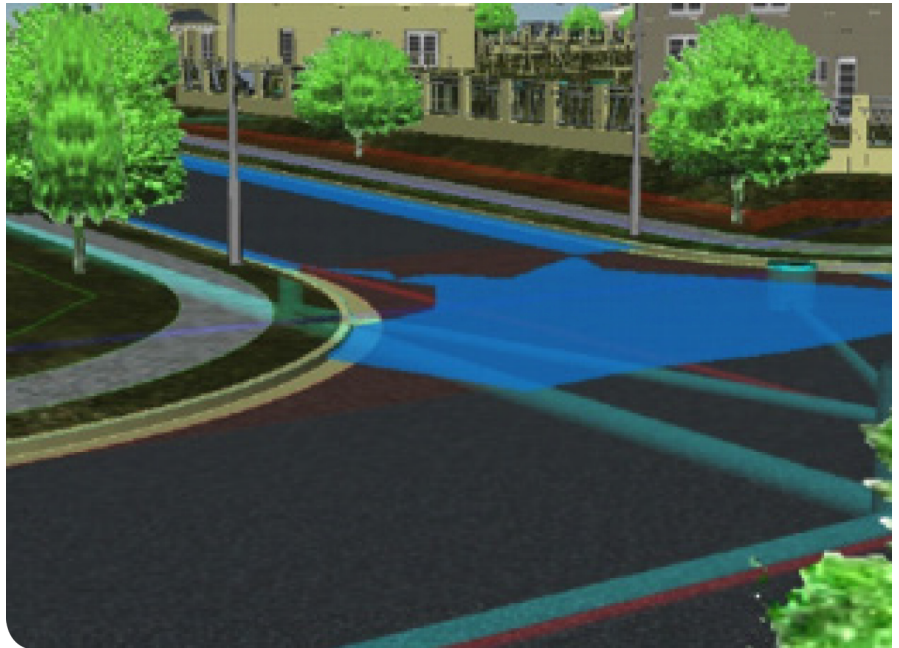
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Olympic Village London 2012, UK

London Olympics athletes' village utility design



Integrated civil design including subsurface utilities

The Challenge

ARUP as an industry leader has a long history of successful high profile projects. The complexity and the timeframe of the London Olympic Village project required a new way of executing civil engineering design.

There were many risks, one being the constrained nature of the site and the additional utility installations required to support the Olympic Games. The tight deadlines meant that it had to be done right the first time.

The design process would also require the ongoing development of options as stakeholders provided comment. Each option would require the recalculation of the design to consider the impact of small changes on the overall design.

Once confirmed, the design had to be seamlessly converted to design documentation for use by construction contractors who in most cases were already onsite awaiting the design details.

The Solution

12d Model was implemented rather than ARUP's standard civil engineering design platform. The decision was based upon 12d's ability to automate manual tasks, produce fast conceptual designs and ease of implementing changes.

All earthworks, roads and utilities were modelled in 12d Model. Its sharing and collaboration features enabled designers working on different elements of the civil design yet reference data to ensure that there were no clashes. This improved productivity and shortened the design process.

"The modelling of all subsurface utilities in 12d Model was the ultimate design solution to prevent problems during the construction phase."

Design options were tested and implemented using 12d Model's automated recalculation features. This provided an opportunity to optimise the design for construction and ease of servicing.

With the whole civil design in 12d Model, the design team and the client were able to view complete 3D design and carry out 360° design reviews prior to the development of design documents and start of construction activities.

Result

12d sped up the design cycle by automating many manual tasks and allowing project designers to reuse standard components. Several existing processes were streamlined and ensured the project was completed on schedule.



Roads and Highways

12d Model's design option is the smarter solution for the design, modification and maintenance of Road and Highway projects.

Enjoy advanced 3D tools to design local and major roads, intersections, roundabouts, highways, interchanges and much more.



Ports and Dredging

12d Model is the solution for port infrastructure and dredging, easily managing the very large datasets and complex volume calculations often required by these projects.

A complete range of flexible and customisable volume calculation tools allow teams to extract and present the information quickly and easily.



Land Development

12d Model is the most versatile solution for the creation of sustainable land development projects, including residential, commercial and industrial developments, recreational areas, landfills, and agriculture projects.

Easily manage all aspects of your land development project from earthwork quantities, road design utilities and drainage design.



Airport Infrastructure

12d Model provides a solution for the design, construction and analysis of new airports, as well as the upgrade and maintenance of existing runways and airport infrastructure.

Easily manage large airport infrastructure projects and share data across multi-disciplinary teams.



Rail

12d Track has been specifically designed for the survey, design and construction of light, heavy and high speed rail projects.

Extensive railway tools in 12d Track allow the rail designer to quickly and easily design their projects. These options are built on the existing 3D modelling and design tools available in 12d Model.



Mining Infrastructure

12d Model's powerful set of exploration, site investigation, survey and analysis tools are crucial for the initial design, construction and ongoing operation of mining projects.

Comprehensive tools for the survey, design and construction of access roads, railways, earthworks and services allow for the coordinated design and management of mining infrastructure from within 12d Model.



Drainage, Sewer and Utilities

12d Model provides comprehensive tools for the design, analysis and optimisation of stormwater and sewer projects using rational, dynamic (hydrograph) and 2d drainage methods.

Powerful clash detection management allows for efficient 3D modelling of service networks such as gas, electricity, telecommunications and water prior to construction.



Surveying

12d Model is a complete surveying package providing the tools to manage all facets of surveyed data including LIDAR, topographical, as-built, conformance, traversing, geodetics, data mapping, labelling and much more.

The 12d Field option runs on a ruggedized tablet and gives the user access to full 12d Model functionality, allowing you to take the entire project into the field with the most comprehensive pick-up and set-out tools.



Oil and Gas

12d Model assists with the design, construction and mapping of oil and gas pipelines, original site exploration and the wide range of infrastructure required for oil and gas projects.

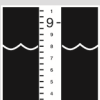
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



Construction

12d Model is the ultimate software for construction with powerful set-out options, direct interfaces to machine control and detailed conformance reporting and auditing.

Manage 3D data and control volumes, quantities and progress claims with 12d Model. Set-out your project and undertake conformance and as-built surveys live on-site using 12d Field.



Rivers, Dams and Hydrology

12d Model handles very large datasets and interfaces with a wide range of analysis packages, making it perfect for flood studies and the management of rivers and dams.

12d has partnered with industry leading analysis software, allowing users to apply 2D drainage analysis from within 12d Model.



Environmental

12d Model's ability to handle very large datasets combined with flexible and comprehensive 3D analysis and modeling tools make it perfect for a wide variety of environmental projects.

Existing workflows can adopt 12d Model easily as it allows users to directly interface with GIS systems and most software packages and file formats.

Why Choose 12d?

- **Powerful data processing & intelligent functionality.**
- **Modular, easy to update & completely customisable.**
- **Seamless integration with major industry software and hardware.**
- **Used in over 55 countries worldwide.**
- **Friendly support & training from industry experts.**

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