

Ground Developments Ltd

Julius Newman

CLIENT: Taylor Wimpey

SCOPE:

Residential development - 162 new homes.

12d DIMENSIONS:

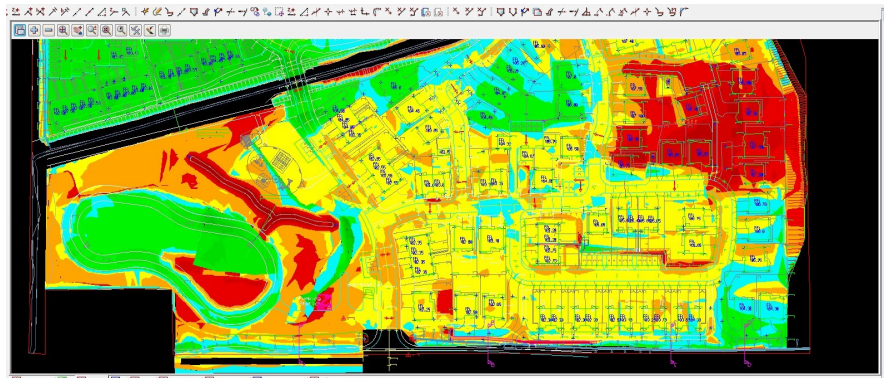
- Earthworks
- Drainage

Project Summary

Residential development – 162 new homes (100,000m³ of earthworks/soil stabilisation).

Ground Developments' role as enabling works contractor was to carry out earthworks and drainage for the site and leave a soil-stabilised end product for roads and building platforms.

Colzium Estate



Earthworks Compliance

The Challenge

The major problem with numerous new sites throughout Scotland and Northern England comes from poor quality (waterlogged, peat, overlying) materials being inherent within the sites. The role of a soil stabilisation contractor is to ensure delivery of a foundation solution that meets the required loading specification for the roads, building platforms, etc.

That stabilised product is produced to 95% dry density with various CBR requirements. Due to the stringent end bearing requirements for roads and housing platforms, Ground Developments became the UK industry leader for residential soil stabilisation solutions, leading to higher end product outputs for their clients.

To achieve these solutions, the Ground Developments team took to encouraging engineers to provide attribute rich datasets, but sometimes the level of information coming from service providers and some engineers was still lacking. Therefore, in a roundabout way, the as-built data going back to the client was often better than the data being received. In some respects, they were almost 'reverse engineering' the site.

The Solution

As the requirements for stabilisation became paramount, the utilisation of technology became even more important. Ground Developments invested in 12d Model software for design and survey purposes, to ensure they could deliver quality results faster and more effectively. Through the use of 12d Model and GPS machine control, they revolutionised the development of soil stabilised building platforms in the region.

They used several facets of 12d Model to assist in their works, including:

- Detailed Alignment Design for road design, boxing and haul roads
- Volumetrics and TIN Analysis for volumetrics (inclusive of on-site instant analysis using 12d Field)

- 12d Survey/12d Field for as-built and on-site analysis, monitoring and data collection.

They also used several other features within 12d Model for quality assurance purposes, inclusive of pipe sizing, conformance surveys, as-built surveys, and reporting and visuals.

The primary benefit came from the delivery of exact layers in stabilised platforms. Using a combination of binders and soils, the team generated a mixed soil solution which had to be laid in exact depths to meet compliance requirements. This was generated from surveying the excavated levels using 12d Field, and then analysis of the slope/surface. They then further compared the final formation level. From this, they produced an optimised design surface for Machine control. They could then export the data almost instantly to ensure grading the layers to exact depth requirements.

Upon completion of the layers, they carried out conformance surveys to ensure that they were delivering within design tolerances.

The team further utilised 12d Field for drainage works in both setout and as-built. The advantages of utilising 12d came from the chains that they set up for processing the datasets into a deliverable output. This includes the sizing of pipes (which assists in working out inevitable conflict that the utilities providers would then have with the constructed networks). This provided the team with the advantage of being in the best position to provide information on the site.

Result

They automatically generated drainage deliverables through chains and the utilisation of some handy macros for outputting. This automatic generation was also implemented for their volume and site analysis, which again was hastened through chains. They were greatly advantaged by the ability to generate these outputs while on site, using 12d Model with 12d Field.

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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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.

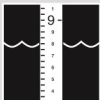
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



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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