Customisation

Tatras Consulting
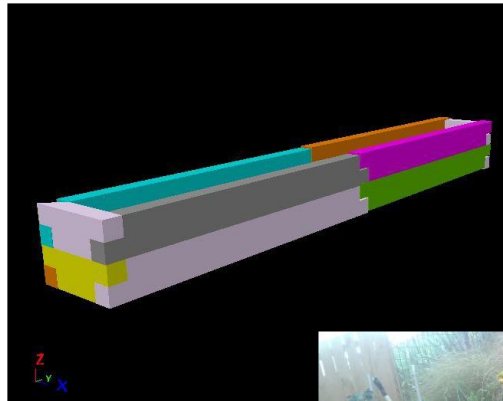Manipulating 3D Objects

END USER: Samuel Cech
LOCATION: New Zealand

12d DIMENSIONS:

BIM
Design
Visualisation

12d Model

The real thing

Project Summary

12d Model customisation – a macro that can use the standard Translate, Rotate and Transform commands in a specific way.

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.

Americas: Vancouver
E: americas.sales@12d.com
P: +1 206 905 1464

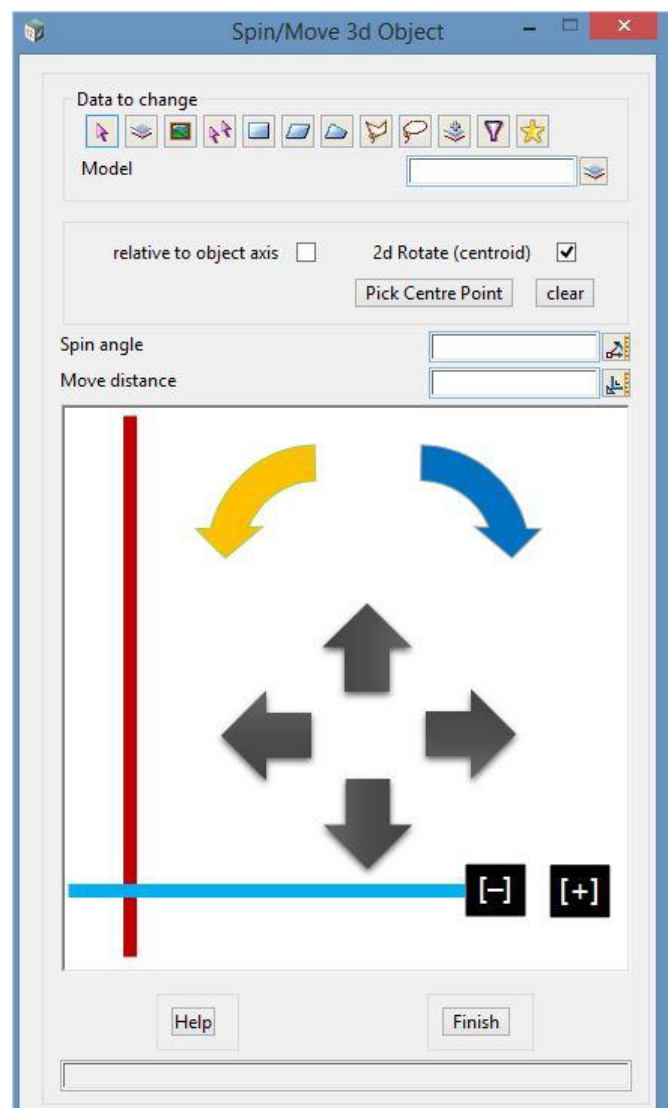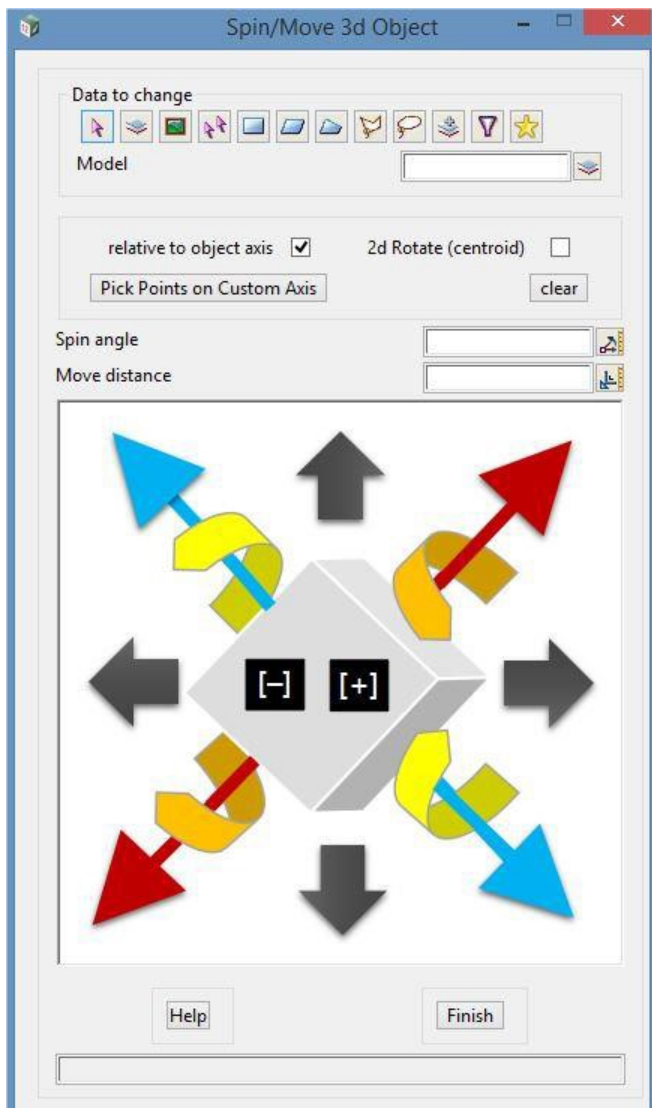**Australasia:** Sydney
P: sales@12d.com
M: +61 2 9970 7117

Europe: London
E: sales@12d.co.uk
P: +44 845 051 0372

The Challenge

To find a way to manipulate 3d objects created in 12d Model software, or those imported from Revit or other 3rd party packages.

According to Sam Cech, "Being able to import 3d objects into 12d Model is a great feature – it enhances the visualisation capabilities and brings BIM tools into Civil software, closing the data exchange loop."

"BIM civil design is very much here," said Sam. "We have been helping clients utilise assemblies of BIM objects in their Road and Drainage design. 12d Model Roading Snippets are brilliant tools to improve productivity and generate BIM objects for volume calculations as well as 3D Visualisation. Well-developed Snippets make the design process faster by giving users choices of standardised elements and generating unique trimeshes from individualised user inputs without the need to manually code hundreds of lines. These BIM objects are used to automate drafting to a level of detail traditionally achievable only by manual means. We have also developed macros for the automated import of BIM objects/ trimeshes along linear features such as street lighting, fences and guard rail posts used in 3D views to achieve more realistic visualisation and perform 3D clash detection with 12d Model's advanced clash detection tools."

The Solution

The innovative example Sam used to find a solution to his issue of how to manipulate 3d objects created in 12d Model software, or those imported from Revit or other 3rd party packages, was inspired by a recent gardening project: Creating a garden box from macrocarpa sleepers with interlocked pieces of timber on a sloped retaining wall. The end cuts had to be designed aton a specific angle. To verify the dimensions of each piece of timber, a trimesh object was created inside 12d Model. The results were passed on to a master carpenter to cut the sleepers to the exact shape.

Sam's idea to solve the issues within this project was to introduce a macro into 12d Model that would be able to use the standard Translate, Rotate and Transform commands in a specific way.

Early in the development of this solution, it became apparent that general trimesh objects would be easier to manipulate if they had a user defined axis around which he could rotate and shift these objects. To this effect, Sam created a system of object axes using trimesh points or custom positions on the trimesh and stored these as attributes on the trimeshes to be manipulated.

Once each trimesh object has an

12d Model

axis, it is much easier to translate and rotate the objects. The User can then clearly understand and anticipate the result of each command within this macro.

Result

Tatras Consulting used this macro to shift entire trimesh assemblies for bridges into a position at the end of their road design.

Of Trimeshes, Sam declared, "[They] take 12d Model beyond its traditional precise Civil applications to a world of realistic combined civil and structural visualisation, with absolute precision."

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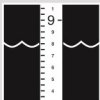
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.

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.

AMERICAS: Vancouver
E Americas.sales@12d.com
P +1 206 905 1464

AUSTRALASIA: Sydney
E sales@12d.com
P +61 2 9970 7117

EUROPE: London
E sales@12d.co.uk
P +44 845 051 0372

12d Model