Queensland Rail
Roger van Croonenborg

CLIENT: Queensland Rail

SCOPE:

Develop a tool to create input files to be read by the horizontal and vertical least squares dialogues in 12d Model.

12d DIMENSIONS:

● Customisation

Reformat Field File
And Hz & Vz Least Squares Input Files

Project Summary

The team at Queensland Rail (QR) had the idea to develop a tool that would create input files to be read by the horizontal and vertical least squares dialogues in 12d Model software. The program would read a field file and extract all the observations to the control points and write the data out to the *.in and *.lin text files. This would save a lot of time compared to manual entry, and remove human error. The files could be read into the Least Squares dialogues and processed.

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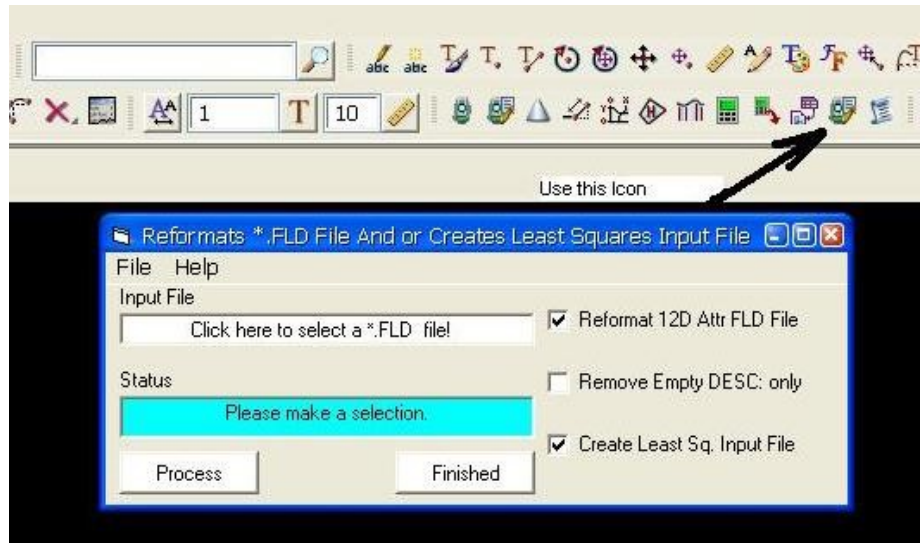
Americas: Vancouver
E: americas.sales@12d.com
P: +1 206 905 1464

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

The manual input of traverse data into the Least Squares Dialogue in 12d Model can be prone to user error when manual calculations are involved. As a response, QR set out to develop a utility that creates a Horizontal Least Squares Input and Vertical Least Squares Input files from the field file. The Horizontal Least Squares Input file was to have the extension YourFileName.in. The Vertical Least Squares Input file was to have the extension YourFileName.lin. The files were to be saved to the same location as YourFileName.fld.

The Solution

The attribute reformat was written at the same time that the 12d Attribute Macro was developed. At that time, the Macro only removed the white space 73 lines, not the unpopulated attribute. Hence the functionality was included in this tool.

To enable the proper use of the attributes attached to a given observation code, the attribute had to be given its correct attribute type. The line identifier in the field file is used to determine the data type and therefore the way 12d Model can handle the attribute. With the QR Code library set up for generic use, the reality is that the majority of feature codes will not have a populated attribute attached to an observation code in every instance.

The created tool reads the field file and interrogates each code attribute and reassigns the correct data identifier to the attribute and deletes any unpopulated attributes.

Result

This utility reformats the field file attribute data and removes all unpopulated attributes with the goal of only displaying useful information instead of empty descriptors in the project.

The tool developed reads a field file and extracts all the observations to the control points and writes the data out to the *.in and *.lin text files. The files are read into the least squares dialogs and processed. The control model created is then used in the field file reduction to control the processed observations. Screen clutter is reduced, and efficiency increased—saving time and money.

12d Model

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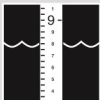
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.

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.**

12d Model