



The Dirt Digger



Welcome...

to the June issue of Dirt Digger. What, June! Next it will be Christmas in July and then, before you know it, the real Christmas!

The first half of the year has been focused on rolling out 12d Model. Thanks for all the positive feedback and suggestions for more features in the next version.

Also in this issue are accounts of how 12d Model (formerly known as 4d Model) has helped Queensland's Department of Main Roads on the Marburg Rosewood Road project and Cardno MBK on the Casuarina Beach project.

Queensland Main Roads ROADTEK Consulting Services has set a new benchmark in the presentation of survey information following the use of 12d Model on a survey of a road corridor on Queensland's Marburg Rosewood Road.

Cardno MBK was able to meet the challenge of very tight deadlines on the design of the Casuarina Beach project by using 12d Model to reduce the huge variety of calculations required.

There is also news on our alliances with measuring instruments manufacturer Sokkia Pty Ltd and route planning specialist Quantm. These alliances highlight the importance of 12d Model to the civil engineering and surveying industries and make our software even more accessible to engineers, draftspeople and surveyors.

With 12d Model now becoming the software of choice in many parts of our market it is important that there are plenty of people skilled in the software. This issue of Dirt Digger carries a list of the institutions running training courses on 12d Model and news of a contractors' register which will enable us to match up 12d contractors and clients.

We hope you enjoy this issue of Dirt Digger and look forward to receiving your suggestions for future issues.

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12d replaces SDR Map at Sokkia

4D Solutions has entered into an agreement with Sokkia Pty Ltd and Sokkia Pte Ltd (Singapore) that will see 12d Model software replace SDR Mapping and Design software in Australia, New Zealand, SE Asia, South Asia, The Middle East and Africa.

Sokkia, established in Tokyo in 1920, manufactures high-quality measuring instruments and has made many contributions over the years to the surveying and measurement industries.

"We are excited to be teaming up with Sokkia, which produces some of the most technologically advanced measuring instruments in the world," said Dr Lee Gregory, Managing Director, 4D Solutions.

"We intend to work together to make the transition from SDR to 12d Model as seamless and trouble-free as possible for users," he said.

4D Solutions will hold educational seminars throughout the region to introduce 12d Model to SDR Mapping and Design users.



Quantm alliance

4D Solutions has recently formed an alliance with route planning technology leader Quantm Ltd.

The Quantm technology uses advanced algorithms to optimise route selection, taking into account terrain, geometric standards, geology, costs, and special treatment zones.

Within the constraints defined by the planner, the system investigates hundreds of millions of alignments to determine a range of low-cost solutions.

This alliance means users of both 12d Model and Quantm can enjoy greater integration.

12d takes to the beach

Our software, 12d Model, was integral to the success of the Casuarina Beach project, allowing Cardno MBK (CMBK) to meet extremely tight deadlines by reducing the huge variety of calculations required on a project of this magnitude.

One of the last 'absolute beachfront' sites earmarked for development on the Northern NSW Coast, Casuarina Beach will ultimately be home to more than 5000 people.

The development is the project of Consolidated Properties Pty Ltd, a Brisbane-based firm primarily involved in commercial developments. The supply of all engineering and environmental services was contracted to Cardno. The joint project is being developed by CMBK's Gold Coast office and its Environmental Unit.

The Gold Coast office was charged with completing the designs, obtaining all Tweed Council and Authority approvals, and supervision of the construction for the infrastructure of over 400 lots and tourist resort sites, to be ready for release by mid-2001.

To achieve these deadlines, CMBK had to rely on creativity and innovation, along with the integration of advanced technology with responsive management.

CMBK had successfully used 12d Model for earthworks and civil design on the Seabreeze Estate subdivision at Pottsville. The company was then confident in selecting 12d Model for the Casuarina Beach development.

As Civil Designer at CMBK, Robbie Marshall stated: "Software packages such as 12d greatly assist in meeting deadlines. The diversity and speed of 12d significantly reduced the huge variety of calculations required on a project of the magnitude of Casuarina."

For the duration of the project, CMBK's Gold Coast office was primarily involved in the engineering design of roadworks, drainage and trunk water mains; the design of over 4km of 200mm diameter sewer rising main; design and reporting on stormwater drainage systems for the overall development, adopting infiltration basins to complement piped and open channel drainage mechanisms; design of a sewerage reticulation system incorporating a regional pump station to benefit Casuarina Beach and adjacent developments.

The 12d Model modules catered for specific tasks involved in these functions, including such capabilities as the alignment module which uses cross-section templates

and string design methods to produce roads, canals and other linear earthwork models. Cut and fill volumes are automatically produced for the design.

When adjustments are made to the alignment strings or templates, the 12d Model recalc option automatically removes invalid information and replaces it with the updated geometry and volumes.

According to Robbie Marshall, this is particularly useful when designing roads, swales, storage ponds or any situation where a number of trials are needed to determine the best position for final alignment.

The drainage module supports the display of drainage networks, typically those required for new land subdivisions and

development projects such as Casuarina Beach. The drainage string itself consists of manholes, joined by straight or curved pipes. Invert levels and pipe grades can be set or modified graphically or by typed input. Manhole and pipe sizes are also user definable.

Robbie explained that earthwork volumes for trenches can be calculated along the selected design line. "The bulk earthworks modelling for Casuarina was carried out using 12d," he said. "It was an immense task over the 38-hectare site but was significantly simplified using the software."

Use of the Volumetrics and Tin analysis capabilities allows calculation of earthworks volumes within a user defined polygon using either end area or exact calculations. Reports of cut and fill areas and volumes are given on a section-by-section basis using the end area method or on a depth basis using prismoidal volumes. Depth volumes can be colour coded for validation and plots.

The integration of these features has allowed CMBK to meet its selection criteria. Robbie explained that CMBK wanted to "increase productivity without reducing quality in the design and documentation of urban developments and civil infrastructure projects".

Highlighting specific features which CMBK found particularly valuable, he cited the increase in speed of road designs due to the fact that preliminary designs could be simply recalculated with the use of template files; time saved using the kerb function; and the string-based design software which allows accurate finish profiles to be obtained.

He added that the software has good interaction with other packages and was easy to learn and to use, even for the non-computer literate.



12d helps Queensland Main Roads work smarter, design faster

When surveyors from Queensland's Department of Main Roads ROADTEK Consulting Services were requested to survey a road corridor on Queensland's Marburg Rosewood Road, some 60km west of the Brisbane CBD, they elected to use 12d Model and Fieldbook 2000, which has set a new benchmark in the presentation of survey information.

Prior to using 12d Model, survey information was processed using CivilCAD or Geocomp and the project was designed using MOSS and AutoCAD. Setout for construction was always manual input from construction plans.

For this project, features and terrain details were captured using a Geodimeter 610 Total Station. The raw survey data was processed using 12d Model to produce the Fieldbook 2000 verification plots and the 12d ascii files for the design team.

The existing and relocated services were also provided in a 12d ascii format using 'super string' attributes.

"On the Marburg Road construction project, Main Roads surveyors used 12d in the field for the actual setout of the control lines, drainage structures and roadside furniture," explained Wayne Hansen, Supervising Engineering Surveyor, Queensland Main Roads.

"All this information was accessed via their laptop computers. Using macros, relevant information was converted into suitable formats for direct uploading into the survey instruments. This eliminates the chance of introducing transposing errors which could have occurred previously as all the data was input into the instruments manually," he said.

"I believe this is the first time that the whole process has been completed using only one software package."

A part of the project in which 12d was instrumental involved replacement of an existing timber bridge over Black Snake Creek with a skewed 3/3600x2100 RCBC on a realigned section of road reconstruction. The reconstruction works involved removal of existing seal, scarifying existing pavement and spreading it to a new width and crossfall profile, and incorporating additional pavement material to provide a finished full-width seal 100mm higher than the existing one. The design also required realignment of two intersections.

Drainage was also updated using 12d Model to determine excavation quantities and 12d stream x-sections were used to calculate stream tail water depths.

The software was used to measure power pole distances to the new edge line which was used in the process to determine relocation works of power poles from the clear

zone. 12d Model provided all required outputs to enable service conflict locations to be priced and relocated prior to construction.

Service Super Strings enabled any long section or cross-section to be developed showing comparison between design/subgrade 'boxing' surfaces with services. Earth works and pavement quantities were calculated using both the x-sectional area method and tin-to-tin method.

The perspective view was used with the drive-through option to view the x-sectional strings and final design which included ground surface and design surface combined as a super tin. This enabled a check of input and the software enabled sight distance to be monitored.

The Digital Design Model created with 12d Model also allowed designers access to information as required.

"The actual setout is streamlined, volume calculations can be determined quickly and accurately and underground services can be viewed on screen, allowing clearances from proposed excavations to be checked before the machines cause damage," a spokesperson explained.

"With the perspective view in 12d Model, job personnel can actually be driven through the completed project before work starts. This is a great benefit, as they can visualise the finished job.

"The digital model eliminates transcription errors by the designers and the transposing errors of the surveyors.



According to Wayne, "12d Model is stable, reliable and easy to use and, in Main Roads instance, the incorporation of macros and user menus written by our staff have further streamlined work practices."

"12d Model helps us work smarter, design faster," he said.

"Whereas other companies seem to be reluctant to improve their software, 4D Solutions is continually improving its offering, particularly in the area of 'super strings'."

Queensland Department of Main Roads has an installed base of 130 licences of 12d Model to date.

Contractors' register

Contractors proficient in 12d Model can now register on the 12d web site -- www.12d.com -- letting us know when they are available for work.

We will then put the contractors in touch with clients who we know are looking for contractors to help them out on a short-term basis.

So if you are moving jobs -- locally, inter-state or even overseas -- do let us know and we'll do what we can to help you land a job at a 12d site.

Likewise, if you are looking for contractors experienced in 12d do contact us -- we might know of someone available in your area now.

Welcome aboard

Sorry, but due to lack of space, many of our new licences/additions must be left until the next Dirt Digger.

Acor Consult - NSW
 AJS Surveys -
 Baulderstone Hornibrook - NSW
 Blacktown City Council - NSW
 Cardno MBK - Harvey Bay, Townsville - Qld
 Coffs Harbour City Council - NSW
 BMD Group - Qld
 CEC Constructions - Qld
 City of Greater Shepparton - Vic
 Civil Design Consulting Engineers - Vic
 Co-operative Bulk Handling - WA
 Coras Iompair Eireann (CIE) - Ireland
 Department of Transport - WA
 Department of Works - PNG
 Dynamic Satellite Surveys - Qld
 East Timor Transitional Authority - East Timor
 Environment Agency - UK
 Eurobodalla Shire Council - NSW
 Ganza Martin - Qld
 GHD - Qld
 Hurstville City Council - NSW
 J Brotherton & Partners - UK
 KJ Blain Surveys - Qld
 KK Surveyors - NSW
 KLM Development Consultants - Vic
 Main Roads Western Australia - WA
 Matchplay Engineering - NT
 Mineral Deposits - NSW
 Pine Rivers Shire Council - Qld
 Proteus Engineers - WA
 Redlands SHire Council - Qld
 Roads Service Northern Ireland
 Ross Campbell & Associates - Qld
 RTA - Tamworth - NSW
 Rylstone Shire Council - NSW
 Scope Surveys - Vic
 Scott Wadley - NSW
 Southbank University - UK
 Thompson McRobert - WA
 Toowoomba City Council - Qld
 United Water - SA
 US Army Corps of Engineers - USA
 URS Corporation - Virginia, USA
 Wyndham City Council - Vic

Educate yourself in 12d

The success of 12d in Australia and overseas has resulted in a growth in the number of courses being conducted on 12d.

Following is a list of TAFEs and universities at which engineers, draftspeople and surveyors can find 12d courses.

We welcome two new universities to the list -- Melbourne University in Victoria and the Southbank University in London.

ACT: Canberra Institute of Technology
Noel Hamey Email: noel.hamey@cit.act.edu.au

Qld: Southbank Institute of TAFE
Philip Moore Email: philip.moore@detir.qld.gov.au

Qld: Qld University of Technology (Surveying)
Graham Blair Email: g.blair@qut.edu.au

Qld: Qld University of Technology (Civil)
Cliff Button Email: c.button@qut.edu.au

SA: Douglas Mawson Institute of TAFE
Doug Thomson Email: dougthom@dmi.tafe.sa.edu.au

Vic: RMIT University
Michael Somers Email: somers@rmit.edu.au

Vic: University of Melbourne - **Russell Thompson**
 Email: r.thompson@civag.unimelb.edu.au

WA: Leederville TAFE
Bruce Willson Email: willsb@lvlle.training.wa.gov.au

UK: Southbank University
Diane Novis Email: novisd@sbu.ac.uk

Top sales & support

4 D Solutions is committed to providing not only the best surveying/civil engineering software on the market, but also the best service and support.

Expert sales support is available from:

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Maria Bernhagen at Critical Image in WA
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