



The Dirt Digger

Welcome...

To the May 1999 issue of Dirt Digger, 4D Solutions' newsletter for our customers, distributors and partners.

Version 4 of 4D Model is now available and in this issue of Dirt Digger we will give an overview of its key features.

We will also look at two more customer sites: Sinclair Knight Merz has found 4D Model is helping them to streamline the design process in the Mindarie Keys subdivision and marina development project; surveying firm Engineering Setout has benefited tremendously by replacing its civil engineering and surveying software with 4D Model.

4D Solutions has recently been accepted by Australian Technology Showcase (ATS), an initiative of the Olympics Business Roundtable, to participate in the program. For more information see our story inside.

Also in this issue is a story on a new module within our drainage suite. The new HEC-RAS module expands the use of the application from drains to rivers.

There are also the other usual features - Enjoy!

Dirt Digger is designed as an information source for our readers as well as a platform for feedback and input from customers. If you have any suggestions or Technical Tips for Dirt Digger in 1999, do get in touch.

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V. 4 raises the bar on civil & surveying software

The latest version of 4D Model civil engineering, surveying and terrain modelling software, sets a new benchmark for functionality, performance and speed.

Microsoft-compliant, Version 4 offers all the advanced existing functionality of the previous version but requires only a PC to run. Customers will be able to take advantage of overlapping and iconising of views, the ability to cut and paste panel fields, a more powerful macro language, super strings, improved communications for supporting survey instruments, extra plot parameters and more macros. Minimal changes have been made to the core code so the program has remained stable and bug-free.

Existing customers will require no re-training because the new version supports the same menuing system as the previous version - 4D Model 3.2.

For new and existing users, 4D Solutions is providing the 4.0 Practise Version for training in the new version. The Practise Version is a free, 5000 point version of the program.

Said 4D Solutions Managing Director, Dr Lee Gregory "4D Model is regularly updated with input from customers and to leverage changing technology. With Version 4.0, we are providing our customers a powerful software tool with advanced functionality – but with the ability to run on a low-cost PC platform."

Have a Field Day!

The annual Engineers Field Days are on again.

One of the largest events on the engineering calendar, the Field Days will again be held at Penrith Panthers. This year the show will run from Thursday, May 6 through Saturday, May 8 and is open to engineers, surveyors, etc from both the public and private sectors.

4D Solutions will be on Stand P20. Drop by and see version 4 of 4D Model in action!

Please contact us if you would like a ticket to the 1999 Engineers Field Days.

4D streamlines SKM subdivision design

4D Model has proved a “quick, powerful and effective tool” in the design disciplines required for the on-going construction of

Mindarie Keys, a major subdivision and marina development in Perth’s northern suburbs.

The development, located 30 minutes from Perth on the ‘Sunset Coast’, is an ongoing project of leading multi-disciplinary engineering firm, Sinclair Knight Merz. Sinclair Knight Merz operates Australia-wide with offices in all capital cities and many regional centres such as Cairns and Newcastle, as well as in South East Asia, the Pacific and Europe. The Perth office has a staff of more than 200.

The Mindarie Keys project has been underway for some 10 years and is expected to be finalised in another three to five years. Construction over the entire area is around 60 percent completed. The development offers some of Perth’s most attractive land, the majority of which has spectacular views to the ocean and marina.

To date the estate comprises residential accommodation, a resort hotel, a marina, shopping centres, cafes and restaurants, and three primary schools. A private high school is currently under construction. Sinclair Knight Merz has been involved in the project since its inception.

Design for the subdivisions in the development involves detailed bulk earthworks, roadworks, drainage and services design to enable the creation of attractive sites to take advantage of the views offered by the varying terrain levels. According to Steve Park, the Sinclair Knight Merz designer responsible for the project, powerful software was needed to handle the large data sets required to optimise the development of the models for the bulk earthworks necessary for a project of this magnitude.

Initially designed for fast preliminary design of major roadworks, 4D Model is capable of handling projects in excess of 1,000,000 points, and 200,000 points is regarded as a small to medium-sized project. This was one of the features which attracted Sinclair Knight Merz to the software when it conducted its initial evaluation some two years ago, Mr Park noted.

“We were previously using a number of packages but with several large jobs coming up we wanted something which would handle more data intensive applications. We evaluated a number of packages then trialled 4D Model for a month. It met our needs and requirements, initially for the Mindarie Keys project, but then also for other large subdivision contracts we had,” he said.

“It is quick and very powerful for road design and intersections and we can put our drainage design into it to create the full model. We’re getting quicker and more accurate quantities and volume figures than before; it definitely makes the job easier. The fact that it handles such a large number of points makes it an excellent tool for large projects.

“We no longer have to split large projects into sections, which made them more difficult to handle.”

According to Mr Park, 4D Model’s easy 3D interface simplifies planning surface and underground routes, tracking conflicts with cables, pipes and so on, and perspective presentation. “The interactive user-definable views allow us to work on any model very easily and provide immediate feedback at every stage of the design process. And, as all commands are transparent, our drafting personnel do not have to change models or open and close different parts of the program. A recalculation facility allows rapid redesign as modifications are made,” he added.

As well as giving earthworks quantities quickly using end area and exact methods, the software incorporates string and template design methods for total flexibility for jobs ranging from rural roads to multi-lane divided roads. It supports unlimited alignments and a special kerb return function provides facilities for intersection and roundabout design.

Specific modules are available for functions such as cut and fill analysis, alignment, pipelines and waste water design. 4D Model’s flexibility is further enhanced by its programming language (4DL) which enables custom tasks related to specific projects to be developed using its extensive library of design functions.

“Another major benefit has been the willingness of 4D’s developers to respond to our requests for particular features we may need for any jobs. There have been instances when we’ve asked for a feature and they have gone out of their way to build it in for us. 4D’s support and ability to respond immediately to our requests has given us great confidence in both the product and the organisation.”

Congratulations!

Congratulations to long-time 4D customer, Ricky Cox on receiving an Australia Day Award.

Ricky is the Principal Adviser for Design Systems in the Transport Technology Division of Queensland Main Roads. He received the Award for his commitment to excellence and contribution during 36 years of outstanding service.



Out with the old and in with the new

Changing surveying software from one package to another can be a costly exercise. However, according to surveying firm, Engineering Setout (ESO), its move to 4D Model civil engineering and surveying software proved to be more than worthwhile.

ESO's Managing Director, Matt Rowling said, "Being a smaller firm, we were worried about the costs involved in such a changeover as well as the hassle. We had six surveyors already trained in our old software and knew we would have to undergo new training on top of the cost of the software itself. But we looked at 4D Model and everyone agreed it was excellent and a big improvement on our existing system, so we decided to go ahead with the change.

"The company was specifically created to facilitate the needs of the construction industry," said Mr Rowling. "Unlike traditional surveyors, we only handle setout, not cadastral/boundary surveying."

This specialisation has seen ESO grow since its inception in 1990 to become a highly respected company which has had an input in every large roadworks project undertaken in New South Wales in recent times. With over 20 staff and offices in Sydney, Old Bar (near Taree, NSW) and the Gold Coast, it is currently working on projects such as the reconstruction of the Pacific Highway and the Gold Coast Highway.

"The major motivation in changing software occurred when we were working on the M2 Motorway with construction company Abigroup," said Mr Rowling.

"Abigroup was in the process of moving over to 4D Model. They indicated how good it was and suggested we might change over as well. A key advantage of this would be standardisation of software for the M2 project."

Mr Rowling said the changeover was much easier than anticipated. "This was mainly because of the excellent service we had from 4D Solutions," he said.

"As an example, the company arranged a number of training sessions at our office out of normal working hours, at times to suit us. This in itself was a big contrast with our old supplier who had fixed training sessions in business hours with no choice of time or venue. 4D was very flexible and we found their service a pleasant surprise. And our staff had no problems learning the software."

While the M2 Motorway was ESO's first job using the new software; it has been used on all the company's jobs since then.

ESO's surveyors collect data in the field using TP Setout software running on Hewlett-Packard HP 200 Palm Top computers. TP Setout, another Australian product, connects to a theodolite and records field data which is then compared to the 4D Model design parameters which have been pre-loaded into the HP 200.

"The marriage between TP Setout and 4D Model is very good and allows for a very smooth transition of data between the field and the office," Mr Rowling said.

"The Roads and Traffic Authority provides us with a digital model, produced using Moss software," said Greg Newman, ESO's North Coast Office Manager. "This digital data is used to create alignments for TP Setout and for volume calculations.

"The 4D software Moss conversion and compatibility features are very good and make this task comparatively simple," he said.

According to Mr Rowling, the software's flexibility is enhanced by the fact that it can utilise macros. This enables ESO users to incorporate routine, application-specific tasks as part of the program and means the software is directly, and immediately, targeting and simplifying the task at hand.

"Twelve of our staff have now been trained in the software, which has become the standard for our company," he said. "It has certainly proved its worth to us."

Showcasing 4D

4D Solutions has been accepted by the Australian Technology Showcase (ATS), an international campaign to promote the best of Australian innovative technology in the spotlight of the 2000 Olympics.

The ATS is a New South Wales Government initiative. Targeted at an audience of international business people and media, the campaign will position NSW and Australia as sources of knowledge-intensive industries.

The ATS provides export grant acceptance, encourages and supports organisations in their export endeavours and provides promotional information.

Before being accepted into the program 4D's civil, surveying and terrain modeling software, 4D Model, was assessed and selected by a working group of the NSW Innovative Council.

ATS held an exhibition to introduce 4D Solutions and other companies recently accepted to its program. The Hon. Michael Egan, MLC, Treasurer and Minister for State Development, officiated at the event.

From drains to rivers

So how long does it take you to set up a HEC-RAS backwater model? If you are not using the 4D Model HEC-RAS interface then it is taking much too long!

4D model takes you from raw survey data to a 3D perspective “walk down the river” where you can visualise the full impact of flood water levels.

HEC-RAS is the River Analysis System (RAS), developed by the US Corp of Engineers, Hydrologic Engineering Center (HEC), that has become a benchmark for backwater analysis programs. However, the manual data entry process required to set up a HEC-RAS project has left many engineers and designers feeling more like a data entry person than a water resources specialist.

To model a natural stream, the 4D Model HEC-RAS Interface requires only the channel centreline and the left bank and right bank boundaries to be defined. The interface creates the complete HEC-RAS project ready to run with your discharge, cross section length, section spacing and Manning’s n values.

When channel improvements are required, 4D Model alignment strings define the vertical and horizontal alignment and templates are used to create the required channel shape.

The interface does not stop once the model has been created. The final water surface levels are read back into 4D Model and a water surface triangulation created. This water surface can be shown on long sections, cross sections and of course the perspective view. Flood levels are easily determined at any location along the channel using the quick contours drawn by 4D Model.

Additional features include a “levee tolerance” which will automatically set levee points when the cross section rises and falls as one moves away from the channel centre line.

A “delta y tolerance” provides a filter to remove extraneous data points from the cross section. Currently cross sections of 3km in length are being analysed and this filter is required to keep the total number of points less than the HEC-RAS limits.

For more information on the 4D Model HEC-RAS Interface contact Robert Graham, Water Resources Engineer, 4D Solutions in Sydney on (02) 9970-7117.

Welcome Aboard

New and/or additional licenses at

*Abigroup – NSW
Baseline - Qld
Bornhorst & Ward - Qld
Barraba Shire Council – NSW
City of Geraldton - WA
Colin Hill - NSW
Concrete Constructions Group - NSW
Connell Wagner - NT
Coomes - Vic
Davorin Zivkovic - Vic
Department of Transport – WA
Engineering Setout – Qld
Eurobodalla Shire Council - NSW
GHD - WA
IMA – Vic
Kinhill - Qld
Lawson & Treloar - Vic
Michael Bereza - ACT
Novasprint - Singapore
Queensland Main Roads – Rockhampton, Brisbane, Cairns
Queensland University of Technology
Sinclair Knight Merz – Perth, Brisbane
SMEC - NSW
Southbank Institute of TAFE – QLD
Steven Harpur & Associates - NSW
Waterman Partnership-Housing, London, Leeds
Watsons - Vic
WBCM Pty Ltd - Vic
Willing and Partners - NT
Wollongong City Council - NSW*

Top service & support

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

Expert pre- and post-sales support is available from:

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Alisdair McCrudden at 4D Solutions in WA, Tel (08) 9574 6816, Fax (08) 9574 6816;

Steve Crossley, B.Eng. (Civil), MIE Aust., at SCS Software in Vic, Tel (03) 9802 8849, Fax (03) 9803 1057;

Ian Cameron, B. Sc Ph.Eng.(I.T.C.), Registered Surveyor, at Technical Solutions in Qld, Tel/Fax 07 3378 8702;

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