



The Dirt Digger

Welcome...

to the July 1996 issue of Dirt Digger, 4D Solutions' newsletter for our customers, distributors and partners.

In this issue we look at two successful customer sites - Main Roads Western Australia and some new projects at Gold Coast City Council; preview Cut and Fill Decisions; provide you with the latest technical tips, and introduce some of our new customers.

Also in this issue, we introduce our latest distributor - Sunsoft AEC Services in Malaysia - it truly is a 4D World!

And just to show we are always thinking of ways to make your dreams come true, on page 4 there is a form for you to complete with your three top wishes to be included in the future development of 4D Model.

We look forward to hearing from you.

Dr Lee Gregory
Managing Director

Mr Alan Gray
Technical Director

New Distributor

Due to heavy demand from Malaysia we have appointed a distributor in Kuala Lumpur - Sunsoft AEC Services.

Run by Desmond Siau, a civil engineer with more than 12 years experience in civil engineering packages, Sunsoft AEC Services ably meets our criteria for appointing only those companies which can offer full engineering support.

You can contact Sunsoft AEC Services on Tel. (+60 3) 783 7707, Fax. (+60 3) 780 2262, 15-2 Jalan 2/115A, Taman Pagar Ruyong, Jalan Kuchai Lama, 58200 Kuala Lumpur, Malaysia.

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Closing the Circle

The next important component of 4D Model - extended cut and fill decisions and battering - is now entering the testing stage.

The new Decisions extension allows:

- complicated cut and fill requirements including multiple strata, decisions based on depth below one or more strata or strings, multi-level decisions (i.e. depth decisions followed by fixed elements, more depth decisions, etc); and
- extended battering including repetitive battering, fixed width batters, and battering relative to a string or strata,

This new extension continues the active development programme for 4D Model which began in 1992 with the software being used as a concept planning tool for major highways. It has since been expanded, with the help of a very active group of early adopters, to include site works, sub-divisions, urban roads, and surveying. The final phase -- detailed highway design -- is now under way and should be completed within the next 12 months.

See 4D at ECH&S

4D Solutions will take part in the inaugural Engineering Computer Hardware and Software Exhibition (ECH&S 96).

The show, organised in association with the Institution of Engineers and the publication Engineers Australia, will feature the leading hardware and software products for all engineering streams.

ECH&S 96 will be held on October 9 and 10 in the Grand Hall, on the Podium Level of Centrepont at 100 Market Street, Sydney. Admission will be free.

4D Solutions will share a double stand (no. 11/16) with WP Software and HYDSYS Pty Ltd.

We look forward to seeing you there.

Gold Coast Extends Its Use of 4D Model

Q ueensland's Gold Coast City Council (GCCC) is reaping the rewards of its investment in 4D Model.

The GCCC has put the program to work as a civil design and survey tool, taking in a range of projects including the detailed design of intersections and large earthwork projects such as refuse sites.

The latest road project to be undertaken by the GCCC was an underpass interchange designed as part of the redevelopment of the Pacific Highway.

The extensive task was facilitated by the use of 4D Model and the template modifiers which are a standard part of the roads module.

Template modifiers provide control over each point of a traditional template and form a simple bridge between traditional template methods and the string design techniques that are essential for detailed road design and reconstruction work.

"The design, which involved lowering the intersection by a depth of four to five metres, was completed using template modifiers in 4D Model," said Phillip Weightman, Design Drafter, Gold Coast City Council.

The design called for a bridge underpass, a large intersection and two roundabouts in place of a notorious at-grade intersection. This work involved multi-lane roads with median strips, right and left turn lanes, and acceleration and deceleration lanes.

"The majority of the roundabout and intersection design was achieved using 4D's template modifiers, with little or no adjustments required for the final design strings," said Mr Weightman.

4D reduces the number of steps that a designer would normally take to complete an aspect of the design. Design adjustments can be easily made graphically and volumes recalculated instantaneously.

Kerb Return

GCCC designers also found 4D Model's kerb return very useful.

"For example, we used 4D to create three centred return strings between two straights on each of the four corners of the intersection," said Mr Taynton.

"4D profiled the kerb string in relation to both incoming grades."

4D Model allowed operators to then easily alter the kerb design to allow for real-world scenarios such as services or driveways

"The design advantage of 4D Model is that you can link all facets of design such as gradings of cross streets and kerb returns with the main peg line design," said Mr Taynton. "Instead of having to regrade kerb returns manually, they are updated automatically because everything is dynamically linked. The package is ideal because it provides that versatility."

Both men believe that 4D Model offers road designers considerable time-saving as operators can graphically see any changes they make.

"I can complete a grading or an alignment alteration, invoke a quick re-calculation and see the design contours update on-screen," said Mr Taynton. "That allows me to quickly see the results of my work and decide if that is what I wanted to achieve."

"From a designer's, engineer's and planner's aspect 4D has proven itself to be the ideal package for preliminary to final detailed designs," said Mr Taynton.

Flood Modelling and Future Planning

The speed and flexibility of 4D Model also allowed the Council to quickly and easily check a range of "what if" scenarios for road design and flood modelling.

"It will allow us to experiment with various flood scenarios using rainfall and water resources data along with photogrammetry, imported into 4D Model," said Mr Weightman.

"We then add various Z heights for different flood events at known cross sections; these are put into 4D Model and a surface created. This gives us a surface model of the flooded areas for a certain flood event.

"4D Model can also drape property boundaries on to the terrain to show property owners if a project will encroach into boundaries. They get a much better idea seeing a plot of a perspective view, rather than a cross section."

Another project carried out using 4D Model was the Coomera Charrett where a group of consultants, town planners and engineers from civil and environmental backgrounds spent an intense week looking at planning for the rapid growth of the area.

"We produced slope analysis plans which allowed the planners to immediately look at an area and decide if it was suitable for a subdivision or a road," said Mr Weightman.

"We produced about 40 proposed alignments in about a week using two operators."

The Tipster

When all else fails, read the manual!

4D Slashes Planning Time Tables in WA

Main Roads Western Australia has drastically cut its road planning and associated preliminary design timetables by using

4D Model.

The Rural Planning and Strategies branch of Main Roads recently used 4D Model to complete the initial preliminary design of the 128 kilometre, Marble Bar to Woodie Woodie Road, via the Ripon Hills route. The design project took only four weeks as opposed to the 18 months required by a similar, earlier project.

Mike Darmody, Planning Co-ordinator for the Rural Planning and Strategies branch said 4D Model had been used on numerous preliminary design jobs since being introduced in 1992.

"It has culminated in this large road building task where 4D Model really came into its own," said Mr Darmody.

"When we were developing the Newman to Munjina Gorge section of the National Highway, which was approximately 150 kilometres long through very similar terrain to the Ripon Hills route, the planning and preliminary design phase took 18 months, utilising the best available technology at the time."

The Ripon Hills route had been a dormant road proposal for 10 years but was fast-tracked by the WA Government after intense lobbying by mining companies which have used the existing gravel road to transport minerals and fuel.

The road is regularly closed, due to flooding, for up to six weeks a year and is described as a maintenance nightmare.

The new road, currently budgeted at \$32 million, will carry a potential of 550,000 tonnes of mining products per annum. It will also benefit tourist traffic that is expected to explore the area when the road opens.

"The job probably would normally take four years to complete, for that length of road through that type of terrain," said Mr Darmody. "But the urgency of the requirement means it has to be fast-tracked to a two-year time frame and completed by November 1997.

He believes the user-friendly nature of 4D Model has enabled his branch to usher in new road planning and design techniques resulting in reduced project timetables.

"The need to prepare time consuming, detailed, final design drawings months in advance of road development projects in the remote areas of Western Australia, are gone. "The Ripon Hills project will be achieved using design and construct techniques that

will basically enable us to design the road one day and build it the next. This process is an extension of how roads in the Pilbara and Kimberley regions were built in the past; they were surveyed the day before, drawn up and designed in the camp that night, and final construction levels were handed out to the foreman the following morning."

A road's vertical design profile largely dictates a road's construction costs so the ability to quickly recalculate vertical alignments enables 4D Model users to monitor project costs.

"We can achieve a lot with the road's horizontal locations, such as trying to achieve a 110 kilometre per hour design speed," said Mr Darmody.

"But it is the impact this high speed design has on the road vertically that dictates the cost of the project. This is reflected in the depth of cuttings or heights of embankments and resulting road gradients. A tourist access road can get away with ten per cent gradients but a mining access route with high road train volumes can handle no more than five per cent over short haul distances.

"If there is a need to change any of the alignment on the Ripon Hills route, the user-friendly capability of 4D Model for on site applications is going to be advantageous. If, as construction of the road proceeds, the project engineer is confronted with adverse geology or drainage that was not originally anticipated, the road design can be adjusted on site. Associated changes in road earthwork quantities are also recorded."

Mr Darmody believes 4D Model will also assist with the planing of a future major realignment of the National Highway, North of Perth. The proposed route bypasses areas that have attracted people seeking alternate lifestyles away from Perth.

"4D Model cadastral lot boundaries as well as the topographical model. If a person's lot is going to be impacted by a major road realignment we can call up the legal position of a person's lot and superimpose the alignment on top of this lot.

"Because we have the capability of moving the alignment around and adjusting our vertical profile at the same time, we can show the impact the road will have on the property.

The Tipster

Thinking about protecting your computer and modem from power spikes? A big danger for modems is via the telephone line. For protection, disconnect the telephone line as well as the power cable. It is possible to get surge protectors for telephone lines.

Welcome Aboard

*Cossill Webley (Additional licenses)
Engineering and Environmental Consultants
(Malaysia)*
*Fisher Stewart (Geelong, Wangaratta &
Traralgon)*
Granger Computing Services (Qld)
HDS Pakenham Project Office (Vic)
HECEC (The Philippines)
Jeff Mouldsdale and Associates (NSW)
Kevin Lodge Engineering (WA)
*Main Roads, Queensland (Roma, Cairns, Land
Survey)*
Panoramic Solutions (NSW)
Sinclair Knight Merz (Sydney)
TriCAD Design (Newcastle)
Wood & Grieve (Additional licenses)

Top Service & Support

4 D 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:

Dr Lee Gregory, *Ph. D. (Maths)*, or Alan Gray, *B. Eng (Civil)*, at 4D Solutions, Tel. (02) 9970 7117, Fax. (02) 9970 7118;

David Francis, *M Sc Civ Eng*, at Condor in WA (formerly Integrated Technical Software), Tel (09) 322 2377, Fax (09) 322 2380;

Don Peters, *B. Eng (Civil)*, at Reoforce Systems in Qld, Tel (07) 3848 7270, Fax (07) 3848 7282;

Peter Strods, *B. Eng. Grad Dip Sys Anal Grad Dip Munic Eng*, at HDS Computing in SA, Tel (08) 267 4577, Fax (08) 239 0111; or

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

Desmond Siau, *B.E. Hons (Civil), C. Dip. A.F., MIEM, M. Eng.*, at Sunsoft AEC Services in Kuala Lumpur, Malaysia, Tel. (+60 3) 783 7707, Fax: (+60 3)780 2262

The Tipster

Warning - do not use any pre-Windows 95 DOS defrag utilities on any FAT disk partitions used for Windows NT. Early versions of defrag will destroy the long file names used by Windows NT and Windows 95.

Make a Wish!

When you wish upon a star, it makes no difference who you are, when you wish upon a star your civil engineering dreams just might come true!

Existing and potential 4D Model users -- send us your three top wishes and you may see them in the next version of 4D Model, Australia's most advanced 3D civil engineering programme.

Many of you have already made requests through our very popular Bug and Enhancement Request System (BERS). By giving us your top three wishes you will help us prioritise our development schedule to focus on the most popular and/or pressing needs.

And for those of you who are not already fully conversant with 4D Model, you never know, your three top wishes may have already been granted.

Name: _____

Title: _____

Company: _____

Telephone: _____ **Fax:** _____

Email: _____

Postal Address: _____

Wish 1: _____

Wish 2: _____

Wish 3: _____

The Tipster

Since AutoCAD R13 has extended the definition of the DXF, it is not always possible for the DXF produced by 4D Model to load into AutoCAD and vice-versa. We offer the following tips to make the file transfer easier:

When transferring data from AutoCAD R13 to 4D Model use the DXF out option and select 'o' for objects. This will create a DXF file without a header which can then be read into 4D Model. (In AutoCAD R12, 'e' for entities is selected).

When reading 4D Model DXF into AutoCAD R13, create a drawing with an entity in it and then read in the DXF file. Finally, delete the original entity. Since the drawing is not empty, AutoCAD ignores the header from the DXF file and will read in the rest of the DXF file correctly.