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# A KEANE EYE: More than just metal

Wednesday, 14 March 2007
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**WHEN you think of bulk earthworks you tend to think of the equipment used to do the work – the dozers, the excavators, the loaders, the haul trucks ... and if the job is right, the scrapers.**

That's the natural reaction, and there's something tangible about machinery.

Think about profitable earthworks, and you have to stretch beyond that to how you choose and use the machinery. You might get into things like where you cut, where you fill, which material you move to where, how you minimise the distance you move material, when you move what material, etc.

It gets a lot more complex than just jumping on a machine and pulling a lever – or joystick these days.

Because so many other project works depend on the earthworks being completed, you have to think about when you can hand an area over for other work, so that the whole project can progress – not just the earthworks.

If you really want to manage the job, you must have some idea in advance of what work you expect to achieve within what timeframe, so that you know when things are getting behind and can bring it back on track. It's too late when you get to completion date to say, "Oh, sh ... ugar, I thought I'd be finished by now."

Liquidated damages have a way of sharpening the mindset these days.

Television advertisements might give us a view of Finns as benign buffoons who sit in saunas and make bad puns about sauces, but Finland is a country that takes the efficiency of its construction industry very seriously.

Research there, which resulted from acknowledgement by Swedish contractors in 1999 that they had expensive problems in controlling and monitoring bulk earthworks, led to the development of the DynaRoad software, with DynaRoad3 being released recently. Development work was done in the Construction Economics Laboratory at Helsinki University of Technology.

This software has modules for Plan, Schedule and Control, with those modules being integrated but covering different phases of the mass haulage component of project earthworks.

Plan is used for pre-planning and tendering, and optimises the costing based on a bill of materials and user-specified constraints. Schedule plans and optimises the mass haulage based on the available resources, while Control compares actual to planned data, allowing problems to be identified at an early stage so that corrective action can be taken to bring the project back on schedule.

DynaRoad is not a university play toy, but has been tested on real projects with some impressive results, and savings of up to 5% are claimed for each of the three modules.

Australia was one of the first countries outside Finland to offer this software commercially, through United Consultants (Aust), and Australia has a further connection to leading Finnish research through the CRC for Construction Innovation, hosted by the QUT in Brisbane but involving leading players from all sectors of the industry.

When you look at the pressures on resources, particularly in those parts of the country where the construction industry is a little overheated, it makes sense to invest in software that makes more efficient use of available resources.

Improvements in machinery are great, and successive generations bring increased efficiencies, but the productivity improvements available through working smarter with existing equipment should not be ignored: in terms of numbers this can often overshadow anything available through investment in new equipment.