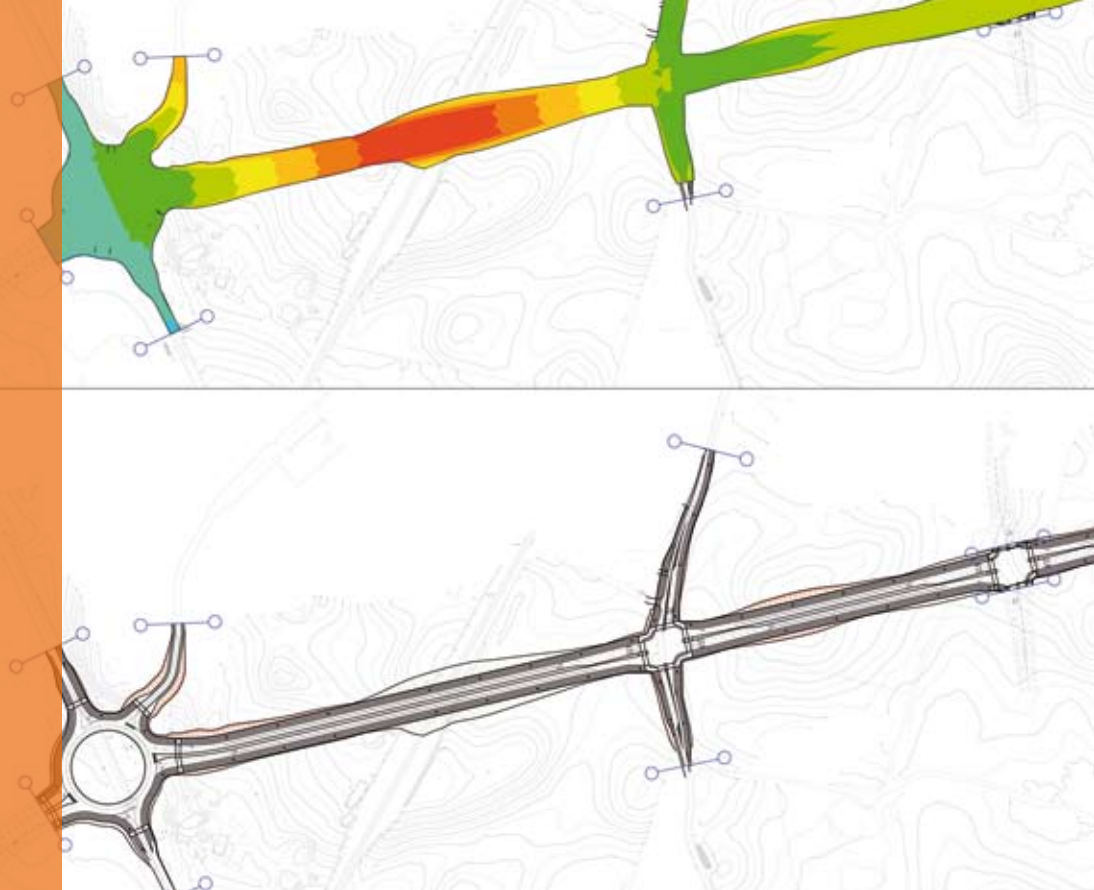




On The Up

AutoCAD® Civil 3D® has transformed Duffy Chartered Engineers from a small engineering firm working on housing developments, to a full-services business taking on road projects.

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Kamil Kieszowski

Civil Engineer, Duffy Chartered Engineers

Since first deploying Autodesk® AutoCAD® Civil 3D® two years ago, Duffy Chartered Engineers has found a world of new project opportunities open up to the firm which have been assisted by Civil 3D.

Traditionally, the Irish firm provides civil, structural and traffic related engineering services. Its civil department has worked largely on housing development projects and land assessments. More recently, however, it has entered the frame for public sector road design work, with contracts ranging from road profile work to flood planning, and it believes the capabilities and scope of the latest Autodesk software have played a key role in producing the product required by the client.

Bridging new opportunities

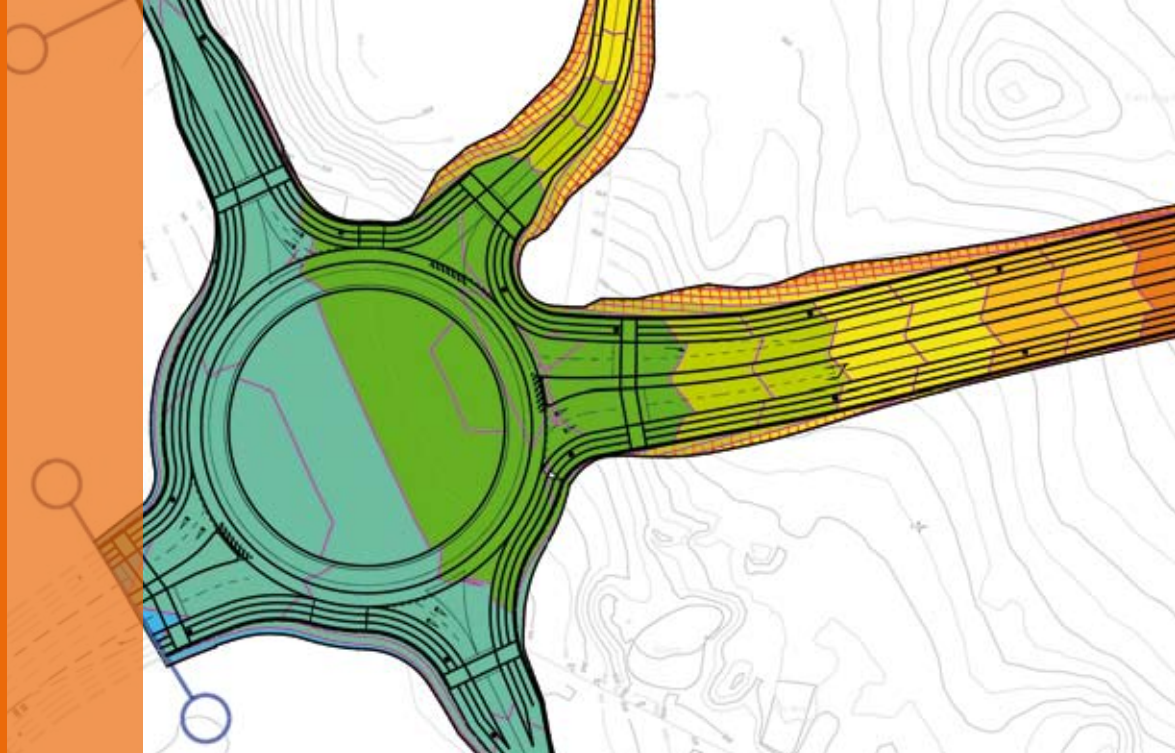
“To secure public sector road design work, we needed specialist road design software to complement our existing specialist drainage and traffic design software,” explains company founder and chartered engineer, Thomas Duffy. “We had around 15 years’ experience of using AutoCAD so when we discovered there was a 3D road alignment design functionality in Civil 3D we investigated this option.”

After seeing demonstrations of the product, DCE concluded that it was a valuable investment and bought the solution from local Autodesk business partner, Paradigm. “Our experience of AutoCAD meant that our engineers were able to achieve proficiency using Civil 3D more quickly than they might have done with alternative specialist design software,” Duffy says.

The investment soon paid off. Recently, the company won a contract to work on two sections of a new relief road in its county of Louth.

“This will be a more elaborate project than our traditional work,” notes Kamil Kieszowski, a civil engineer at DCE. “We’ve got to design two sections of the road, one measuring 3.1km and the second 1.8km. This requires more professional drawings. The cross-sections will be interesting, as this will be a dual carriageway, with one lane for buses, ensuring a better service to the town of Dundalk. One aim of the project is to reduce the number of accesses to create better driving conditions for the road,” he says. The plans must also incorporate railway over bridges.

Being able to prepare preliminary designs using AutoCAD Civil 3D was instrumental in securing the contract, Kieszowski believes.



"We are a small company with only 20 people, and in a very competitive market it is very hard to secure public contracts for roads," he explains. "The Western Relief Road is our first. Our experience of road design previously has been confined to minor roads as part of housing developments, but thanks to AutoCAD Civil 3D we are now capable of taking on more elaborate jobs."

A great sales aid

"The capacity to rapidly generate highly accurate, professional designs in 3D, using real data, never fails to impress clients," he says. "As well as being instrumental in producing and revising designs quickly, this capability also helps win new business – because DCE can quickly produce detailed designs, at very little cost, to show customers what's possible."

"The software lets us 'cut and fill', so when the surveyor takes their measurements and gives us an ASCII file, we simply load this into AutoCAD Civil 3D to get a 3D model of the existing ground, so that we know exactly what we're working with," says Kieszowski.

"This then allows DCE engineers to test out various alternative scenarios 'virtually', before committing any resources. Either the architects or ourselves create a 3D model of the finished ground, and we compare this with the old model, to calculate what's involved to get there."

"Our aim in buying the software was to be able to produce more accurate calculations for clients," Kieszowski notes. "Irish land is very hilly and can be hard and rocky, so if 40,000 cubic metres of earth needs to be moved, this could push up the price of a project rapidly. If this is an issue for the client, we can then use the software to play around with the designs to see if we can reduce the work and resources that will be needed."

Accommodating architects' requirements

Before deploying AutoCAD Civil 3D in 2005, DCE relied on manual calculations. "This took much longer and, because architects tend to change their minds, we'd often have to revise the model several times to try out new layouts," he says. "If it's all in the software, however, it's much easier to make those adjustments."

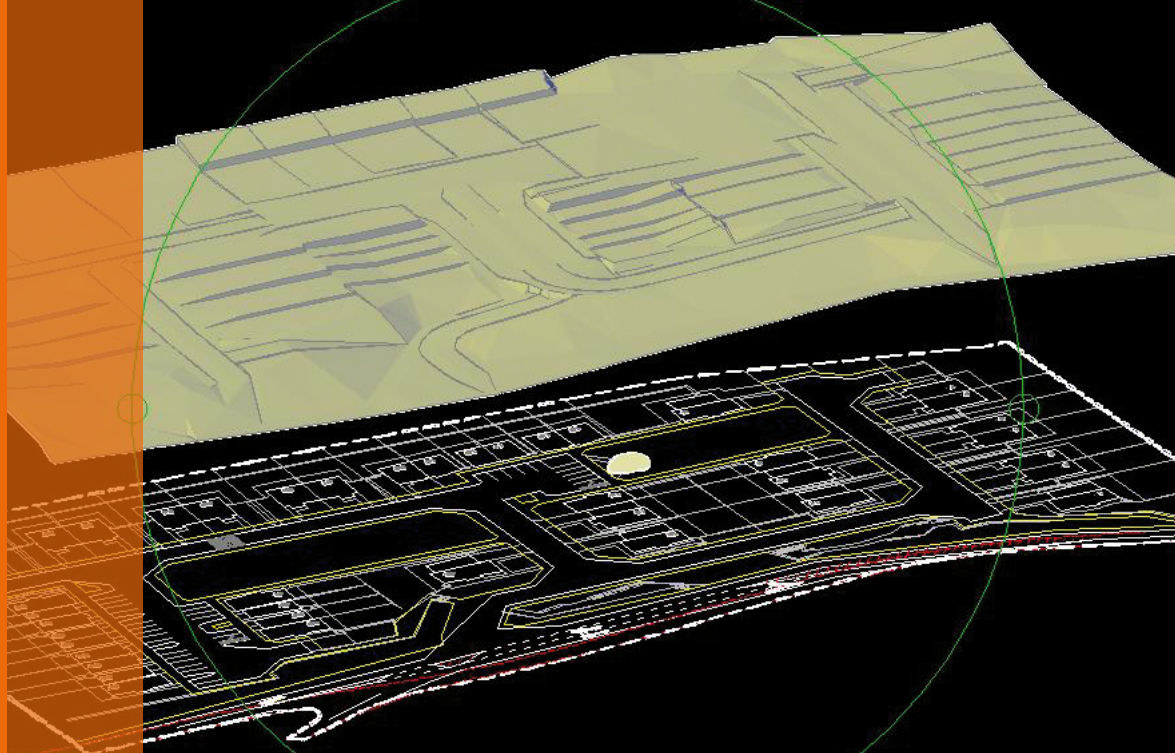
A key contributor to this is the dynamic relationships between each 'object' in the designs. Because these are linked intelligently to each other, a change to any horizontal or vertical alignment will lead to the automatic recalculation of the whole design and all of the surfaces within it.

The accuracy of the calculations is vital to customers, increasing their confidence and reducing their risks and costs. Kieszowski describes one project involving a site investigation into ground conditions. "We found a lot of peat and the ground was very weak," he notes. "We decided we needed to work on ground stabilisation, which meant calculating the percentage of area that needed to be improved. Because we were able to specify this quite precisely, the client was very pleased."

The value of accurate information

"Sometimes clients want particular information, even if it costs to get it," he adds. "This can be the key to the project, so we try to provide it."

So instrumental has AutoCAD Civil 3D become to DCE's business that the firm recently upgraded to the latest release, 2008, to benefit from further enhancements, such as the ability to reduce the size of files using shortcuts.



"Previously, we kept all the data in one file, but this could grow to be 30Mb in size, making it hard to send to architects or clients," Kieszkowski explains. "Now we can keep lots of information outside of the main file, dividing the information as needed, so we can quickly and easily send the latest changes to the client. We can even send these as an XML file which means we can collaborate with companies that don't use the same software."

Another bonus is the inclusion of AutoCAD Map 3D geographical information system (GIS) software, he notes. "We used to rely on another company to produce GIS layers for us but these were separate files, so we couldn't import them into our software. Having integrated GIS capabilities in AutoCAD Civil 3D is very useful. On the Western Relief Road, for example, we had to produce constraints maps, and this made it very easy. In the future it's possible that we may extend our services to provide GIS information to smaller firms in Dundalk. We see numerous opportunities unfolding."

For more information

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