

OUTLINE

Extraordinary projects require extraordinary methods. That shows the first German deep water harbor JadeWeserPort: the necessary depth of water for large container ships must be created and preserved. By help of AutoCAD® Civil 3D® and specific consulting support from UDS positions can be specified very precisely by planners and operators. The operators see exactly where and how much material has to be removed. Administrators are able to calculate to the exact cent.



CUSTOMER

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UDS - Your partner for software projects

People are the best resource for successful projects. People who know a lot and are happy to learn. People who work hard and enjoy laughing with each other. People who know the rules and are passionate about overriding them. People who always listen, because they want to understand. The people from UDS bring experience from their studies, profession and projects with them and are always looking for a better solution. At UDS, successful customer projects are always a success for the team – and they are happy to celebrate them appropriately. Logic is top priority at UDS, which is why we are happy to think outside the box here. Don't forget that 95 per cent of all UDS customers are repeat customers. In short, you're on the right path with UDS.

SAND IS MONEY

Consistent processing of scanned terrain data in Germany's first deep-water harbour

There was plenty to do – above and under water – before the first German deep water harbour, the JadeWeserPort (JWP), was ready for the big container ships in 2012. Shipping channels, access and harbour basins had to be dredged to a depth of 20 metres. With two withdrawal points, the excavation was enough for building the foundations of the new, 1.8 kilometre long and 650 meter wide harbour terminal. Today the harbour area is more or less complete. But this does not apply for the land under water. This is where the water depth needs constant checking and correction as necessary. This means that both the engineering office responsible for measuring and dredging and the system house that provides the software, training and advice literally remain on board.

ENORMOUS QUANTITIES OF DATA

Measuring the terrain under the water level is complicated enough. The measured values then need to be compared with the planning data. And finally the information on where and how much terrain is to be carried away is to be conveyed to the dredging operator in a way that is clear to understand. It is important to shift precisely the right quantity of sand under water as it is calculated in cubic metres. Geo Ingenieurservice, the surveyor's office from Wilhelmshaven, uses a multi-beam process to measure the floor of the harbour under water. The floor is scanned from a ship on a close-meshed grid with the aid of a side-scan sonar. Depending on the water depth and terms of reference, up to

100 points are captured per m². The scanned values are then displayed in a 1 x 1 m grid. Even then, several million depth values remain that need to be processed.

UDS – PIONEERS UNDER WATER

The way from this quantity of points to usable statements takes us through the AutoCAD® Civil 3D® software. To get the best use out of this solution, the Geo Ingenieurservice team included the UDS Urbane Daten-Systeme GmbH system house from Hamburg at an early stage in the project. This was a familiar challenge for UDS – where the cities of Hamburg and Luebeck had already used their know-how. "We are pioneers in underwater projects," explained UDS managing director, Roman Boernchen. "What you need to know for developing and further processing models of terrain from underwater data is something we have learned over the last few years".

CONTINUOUS USE OF DATA

The objective of the IT project was continu-

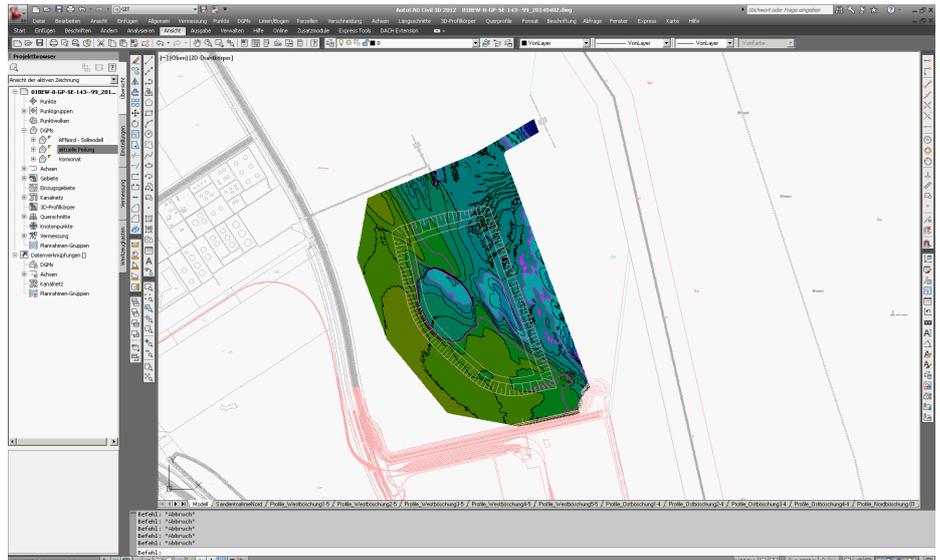


Continuous documentation

ous data processing. It should be possible to transfer the terrain data captured by the multi-beam system in AutoCAD® Civil 3D®, calculate a digital terrain model from this and make this available to everyone involved in the project so they can continue to work with this, with the fewest possible manual interventions. UDS has helped to develop the ideal data structure for this. The data had to be available as measurement points, as a map and as numerical values for accounting purposes. Customisation work was also necessary here in the form of UDS-programmed tools for data assessment. Six employees from Geo Ingenieurservice and a further four employees from the operator and the client were then trained in the operation of the software. The UDS team is still in close contact with the users – be it for any current operation questions or for the realisation of new ideas.

SAVED TIME AND MONEY

Geo Ingenieurservice had worked with AutoCAD® Civil 3D® before starting the planning. This makes a digital, three-dimensional target model available at all times. The regularly estimated current data on the harbour floor is compared with this model. Computers are installed on the dredging ships where they can see precisely where they have to remove or deposit a lot of sand. At the same time the engineering office can determine the quantities to be shifted from this data alone. The fact that this is not actually an AutoCAD® Civil 3D® function is something the users do not notice at all. They didn't need to install any additional software, nor did they need to transfer the measurement data from one software to another. Their program determines the quantities and stores them in REB format, that is in accordance with electronic construction calculations. This way all the people involved in the project had a uniform, verifiable basis for accounting that was within the law, and which could be processed by all accounting programs. Such clarity is a joy for the public authorities and the taxpayers who ultimately pay for this ambitious project. "We are of course also active in this project above ground," said Roman Boernchen. Thanks to UDS, the entire harbour plan was developed for the operating company with the aid of AutoCAD® Civil 3D®. "For warehouse, railway or motorway connec-



AutoCAD® Civil3D® in use

tion, all the civil engineering projects are planned with the same software. This has provided the operators with ownership of continuous documentation.

BIM – THE BEST TECHNOLOGY M

AutoCAD® Civil 3D® is particularly suitable for such projects, as the software uses what is known as BIM technology. BIM stands for Building Information Modelling. This means that all information about a building or other construc-



Excavation work at Jade-Weser-Port

tion project (roads, bridges, railway facilities and premises) are consolidated in a single digital model. So any changes at one point are automatically fed into the whole model and all evaluations – be they as plans, lists, cards etc. – contain the correct information. For Jens Roschke, the authorised signatory for Geo Ingenieurservice, both the AutoCAD® Civil 3D® software and the UDS software house are indispensable partners. Only in this partnership can we implement the

specifications of the building contractor as, from the underwater measurement through to the standard and test-compliant preparation of the data, no more than 24 hours may elapse."

NEW CHALLENGES AWAIT

There is a good chance that the JWP deep-water harbour will flourish when the economy recovers again. UDS will then remain on board – with assignments on land and under water. "The demands are increasing," said Roman Boernchen. "Comparing files is a thing of the past. The data needs to be accessible on mobile devices today, ideally in real time. We're ready for that." Facility management will be playing an important role alongside underwater measurement. Whether it's about simulating logistics processes, administration of real container data and their positions or "totally normal" maintenance and repair work; with the software and services from USD the processes can be tested, planned and checked in advance. There is no longer any duplication of work, mistakes are avoided and the operators can also further reduce their costs.