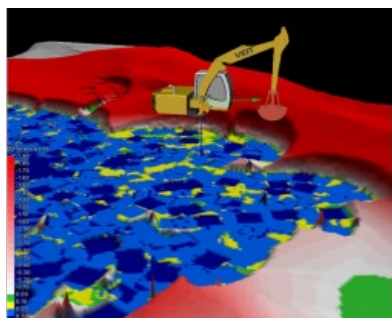


# 3D Clamshell Software for Trimble GCS900 Grade Control Solution for Excavators



Veit, US-based specialty contractors that use Trimble software and hardware on their wide-ranging excavation and dredging projects, found themselves in need of 3D software visualisation in an upcoming dredge project on Superior Bay in Duluth, Minnesota. Veit contacted EIVA through their North American partner, OARSHPSG in Austin, Texas, looking for something that would represent the

clamshell's position and progress in real time. They found what they were looking for in the EIVA software product portfolio in the form of NaviSuite Uca, a software solution dedicated to dredging operations through integration with the Trimble GCS900 Grade Control System for excavators.

## 3D Visualisation and Real-time DTM Features

On previous projects, the Veit operators had a limited view of the project area and their progress. With NaviSuite Uca, they get 3D visualisation, manipulation, and real-time digital terrain model (DTM) features.

Before the Veit project, did not support clamshell bucket types. The integration to support a clamshell in NaviSuite Uca was part of the natural progression.

The integration was handled in three basic steps:

- Physical integration of RS-232 communication from the Trimble CB460 control box
- Integration of the ASCII string from the GCS900 Control Box to logging PC
- Integration of clamshell mapping and visualisation into NaviSuite Uca

## Visual Tracking and Reporting of Sub-surface Progress

Previously, the operators had limited views of what was going on below the water surface. They could see the current position of the bucket and the planned depth displayed as a line, but there was no clue as to what the dredged surface was. As a result, areas were left behind (above grade) or missed altogether. This would cause expensive remobilisation efforts and lost time due to re-work.

This issue was solved with NaviSuite Uca. In addition to viewing the dredged surface as digital terrain models in real-time as the work is being done, the operators can export these DTMs as progress reports to the office while on the job. Previously, DTM manipulation and export were not available so NaviSuite Uca has saved Veit time internally in regards to project tracking.

As the project progressed, condition surveys confirmed that the depths from the calculated NaviSuite Uca surface agreed with the sounding data collected by the survey crew at biweekly intervals. These condition surfaces can be loaded into NaviSuite Uca and the progress of the project over time can be seen using the 4D feature for DTM comparison.

## Result

Veit's project is underway and they are very happy with the progress tracking, 3D visualisation, and mapping available in NaviSuite Uca. The results are better, cleaner looking, and more accurate than anything else they have worked with. Now, Veit is looking at installing the solution on more of their other excavator systems in the future.

## More Customised Dredging Solutions

Veit is interested in adding sensors to their clamshell bucket to sense bucket open-close and rotation. In the current configuration, NaviSuite Uca's clamshell integration cannot tell when the bucket is open, so it alters the existing DTM assuming that the operator closes

the clamshell every time.

Since there is opportunity for error here if the operator does not close the clamshell, support of bucket open-close will be a future feature available on all clamshell setups. This is not only in response to customer demand, but is also in alignment with upcoming special US market requirements by the US Army Corps of Engineers.

Moreover, Veit encouraged communication between the clamshell manufacturer, Anvil Attachments, and EIVA to produce a custom 3DS model with the proper size and scale of the existing excavator. EIVA will continue to work with Veit and Anvil Attachments to integrate and support a tilt and rotation sensor to the clamshell bucket.

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<https://www.hydro-international.com/content/news/3d-clamshell-software-for-trimble-gcs900-grade-control-solution-for-excavators>

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