

# Royal HaskoningDHV Adopts a 3D Digital Workflow to Improve Project Collaboration

Using OpenGround<sup>®</sup> to Create Their Geotechnical Platform Reduces Design Time by 10% to 40%

## **DIGITIZING THE GEOTECHNICAL DESIGN PROCESS**

As an independent consultancy that integrates 140 years of engineering expertise with digital technologies and software solutions, Royal HaskoningDHV attributes its ability to deliver projects on time to its geotechnical design and engineering specialists. To continue that reputation they are transforming their soft soil testing work from a manual, time-consuming error-prone method using PDFs and 2D drawings to a 3D digital workflow. Moondrian, their innovative digital solution platform, automates and digitizes the geotechnical design process, which comprises ground data management and interpretation. As with any geotechnical design, it begins by creating a soil model that combines geological information with interpreted field and laboratory data.

Traditionally, geotechnical engineers use cone penetration tests (CPTs) in soft soil conditions to classify and derive parameters based on empirical rules. Prior to digitizing their workflow, CPTs were handed to Royal HaskoningDHV engineers in a PDF format and laid on the walls, desks, or even the floor in the right order to be examined by engineers in a very time-consuming manner. When working on a large project, such as a recent highway project that had over 1,500 CPTs, such a process is not feasible. When new soil data is added, the geotechnical team must repeat the process, which leads to errors, non-uniformity, poor communication, and the lack of a single source of truth.

Geotechnical engineers have always worked with a limited amount of information, and often their expertise is relied upon to “read between the lines.” But the antiquated process can greatly affect costs, planning, and safety. Therefore,

Royal HaskoningDHV created and implemented their Moondrian platform to digitize the soft soil analysis process.

## **IMPLEMENTING AN INTUITIVE USER INTERFACE**

Royal HaskoningDHV's in-house team developed Moondrian to create an intuitive user interface with OpenGround as the foundation for geotechnical information management. With the new system, uploading CPTs to a new project or an existing project is now done with a click of a button. The interface enables their geotechnical engineers to work on all of their projects in a new workflow and simplifies collaboration. Because in-house engineers were involved with the implementation, they can validate multiple functions and use the new workflow with OpenGround.

The breakthrough solution maximizes the potential of OpenGround and creates a reliable digital workflow that imports, visualizes, interprets, and exports CPTs in a fast, intuitive way. Using empirical formulas, the platform interprets the data visually, comparable to conventional 2D design methods where engineers used colored paper art. “It is like the brain surgeon who actually needs to see inside the brain before making decisions,” said Carlita Vis, technical and innovations director with Royal HaskoningDHV. “Geotechnical experts need to visualize the 3D soil profiles before creating a soil model on which design calculations are based.”

While going digital is invaluable to support an engineer's analysis, it cannot replace their judgement, at least not yet, said Vis. Geotechnical experts always need to confirm the findings before exporting the soil profiles to OpenGround to continue the geotechnical process.

## **PROJECT SUMMARY**

### **ORGANIZATION**

Royal HaskoningDHV

### **SOLUTION**

Geotechnical Engineering

### **LOCATION**

Netherlands

### **PROJECT OBJECTIVES**

- ◆ To convert their process from a 2D-based workflow to a 3D-model and a going digital methodology.
- ◆ To enable engineers to work on their projects in a new workflow and simplify collaboration.

### **PROJECT PLAYBOOK**

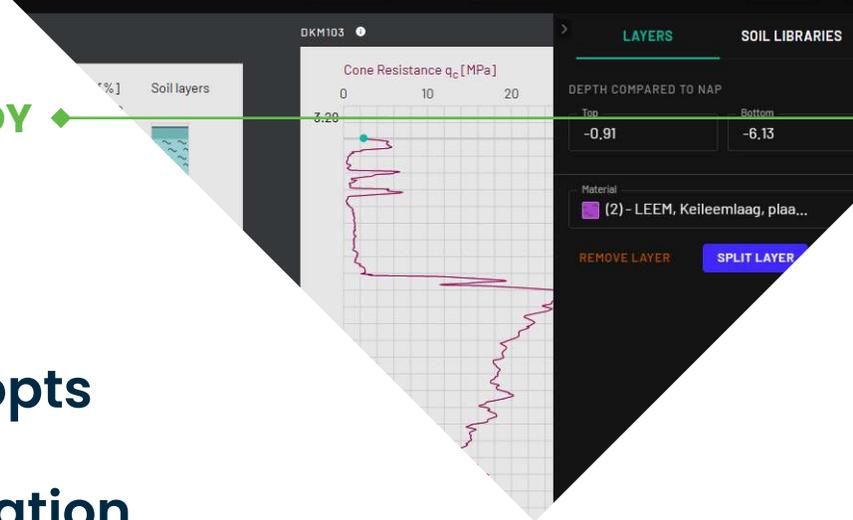
OpenGround

## **FAST FACTS**

- ◆ Royal HaskoningDHV's in-house team developed a geotechnical platform to create an intuitive user interface with OpenGround as the foundation for geotechnical information management.
- ◆ The breakthrough solution creates a reliable digital workflow that imports data from the cone penetration tests to their platform.
- ◆ OpenGround's accessible single source of truth supports Royal HaskoningDHV's accurate soil data and enables a process-based, collaborative approach.

## **ROI**

- ◆ The collaborative digital solution reduced time on small projects by 10% and by up to 40% on larger projects.
- ◆ The platform improves consistency within projects, enhances communication, reduces errors, and supports their data management.



“Without OpenGround to create our platform, we could not have made this transition from 2D to 3D in a reliable, visual way.”

– Carlita Vis, Technical and Innovations Director, Royal HaskoningDHV

## SINGLE SOURCE OF TRUTH ENABLES A COLLABORATIVE APPROACH

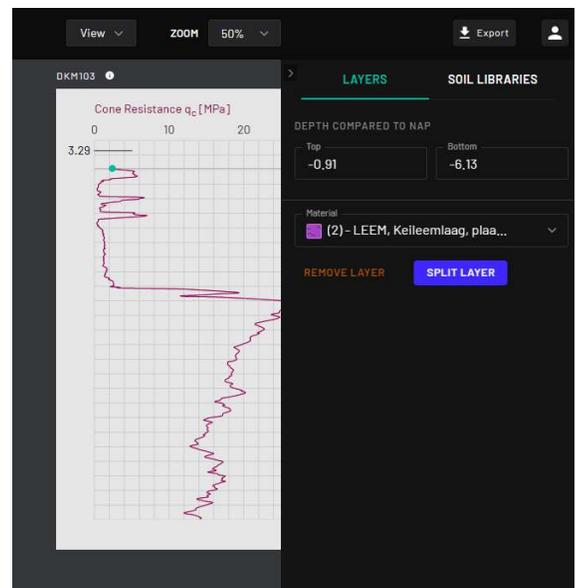
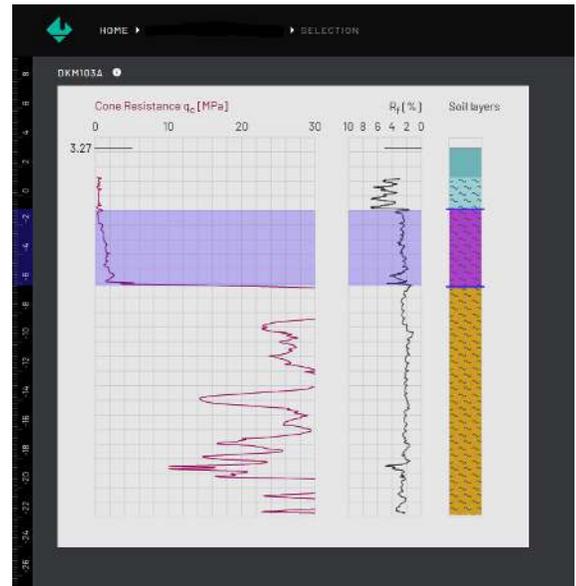
OpenGround's accessible single source of truth supports Royal HaskoningDHV's accurate soil data and enables a process-based, collaborative approach. Having access to accurate data in a 3D visual environment provides holistic context, which improves their understanding of subsurface conditions for data-driven decisions.

“Compared to the old way of printing the PDF and creating nice wallpaper, going digital means speeding up the process, preventing reruns, having a single source of truth using the OpenGround database, having a unified way of working with the template studio, and having a standardized color scheme in the digital solution,” said Wieske Oomen, geotechnical engineer and product manager, with Royal HaskoningDHV.

## PLATFORM SAVES TIME AND IMPROVES CONSISTENCY

The Moondrian platform has helped them reduce time on small projects by 10% and by up to 40% on larger projects, with the enormous potential to maximize the value of data and connect with other design platforms for future sustainable designs. In addition to saving time, the Moondrian platform improves consistency within projects, enhances communication, reduces errors, and supports their data management.

“We can invest the time we save to get a better understanding of the soil conditions, reduce errors, and create more sustainable designs, while using fewer materials, such as concrete piles, for example,” said Vis. “The single source of truth of [having] the right soil data in OpenGround has enormous potential to capture the value of data-driven designs [while] connecting with other platforms in the future. Without OpenGround to create Moondrian, we could not have made this transition from 2D to 3D in a reliable, visual way.”



Royal HaskoningDHV's in-house team developed a platform to create an intuitive user interface with OpenGround as the foundation for geotechnical information management.

Images courtesy of Royal HaskoningDHV.