

World of Royal Eijkelkamp

magazine #1



ROYAL Eijkelkamp
Meet the difference

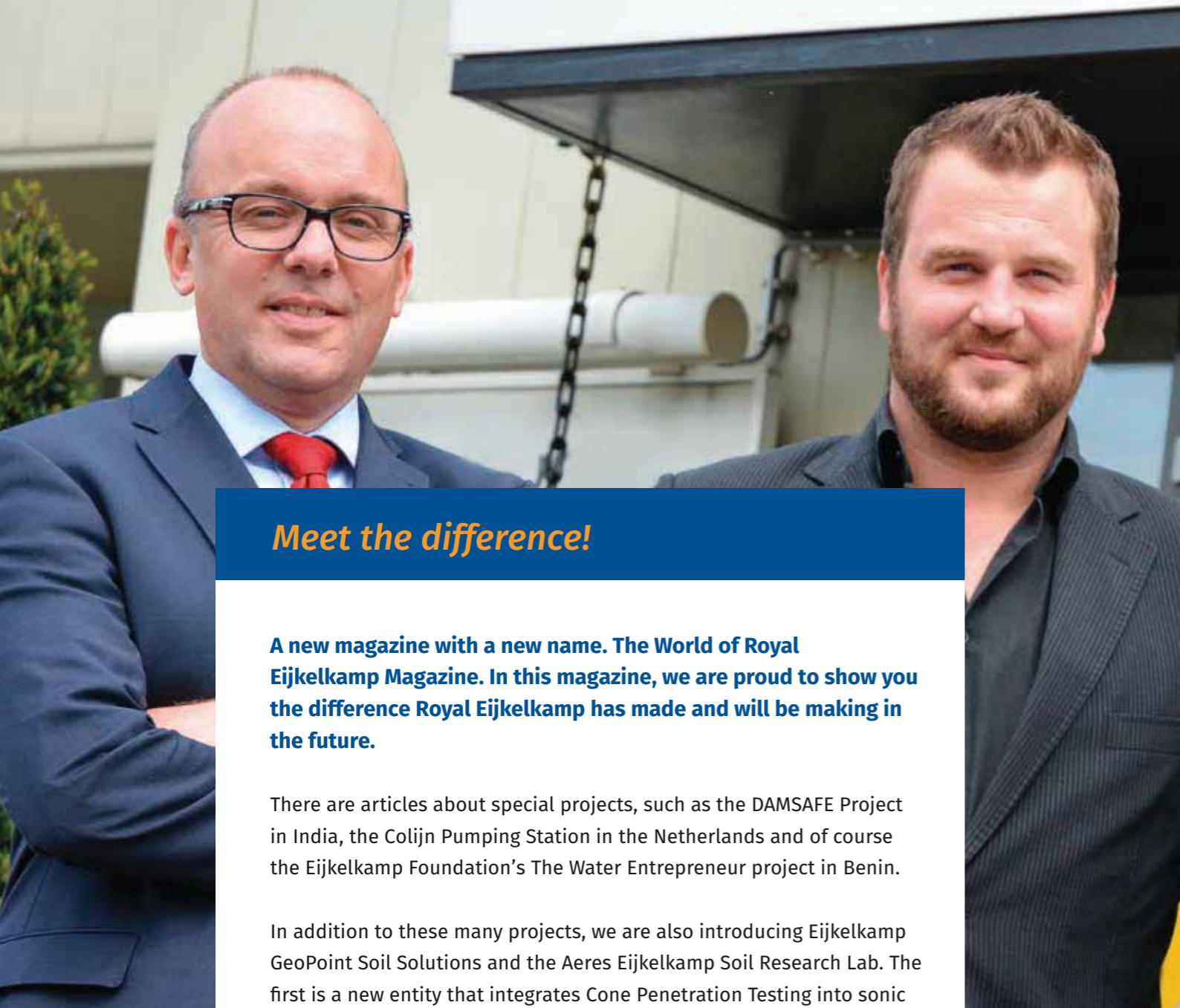
275.000 meters sonic drilling in New Zealand

Safe dams in India

Aeres Eijkelkamp Soil Research Lab

Affligem: Brewing with trust





Meet the difference!

A new magazine with a new name. The World of Royal Eijkelkamp Magazine. In this magazine, we are proud to show you the difference Royal Eijkelkamp has made and will be making in the future.

There are articles about special projects, such as the DAMSAFE Project in India, the Colijn Pumping Station in the Netherlands and of course the Eijkelkamp Foundation's The Water Entrepreneur project in Benin.

In addition to these many projects, we are also introducing Eijkelkamp GeoPoint Soil Solutions and the Aeres Eijkelkamp Soil Research Lab. The first is a new entity that integrates Cone Penetration Testing into sonic drilling systems. The second is a new form of collaboration between the business community, education and research projects.

Fons Eijkelkamp also takes the floor. Not for the purpose of looking back on his 50 years with Royal Eijkelkamp, but instead to speak about how he views Royal Eijkelkamp's future.

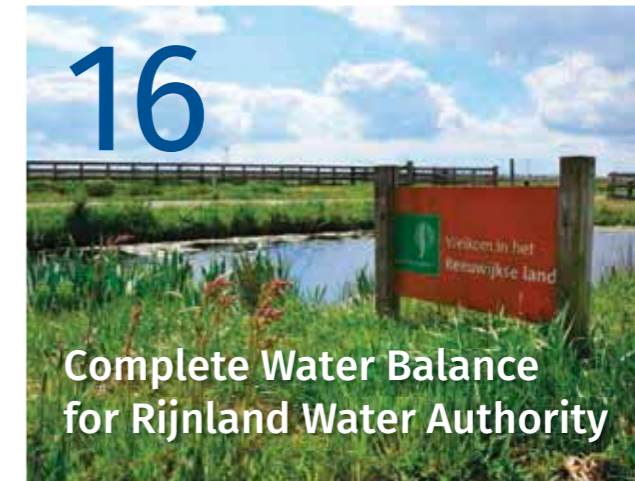
But first, we look back to The World of Royal Eijkelkamp event that took place at the end of September at Royal Eijkelkamp's head office in Giesbeek, the Netherlands.

Enjoy reading!

Huug Eijkelkamp & Frank Tillmann



Content World of Royal Eijkelkamp



'We are concerned about Flemish water quality 24/7'
Smart Sensing used for creating a better living environment.



Aeres University of Applied Sciences in Dronten and Royal Eijkelkamp start up unique Soil Research Lab



Affligem Brewery uses Eijkelkamp Smart Sensing
From 6 Belgian knights to groundwater monitoring

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Colophon

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Review of 'The World of Royal Eijkelkamp'



The World of Royal Eijkelkamp. This is not only the title of this magazine, it is also the name of the event Royal Eijkelkamp organised at the end of September. Over a period of two days, we welcomed more than 750 guests from 30 different countries who were shown the difference Royal Eijkelkamp makes, now and in the future.

André Kuipers, the first Dutch citizen to have completed two space missions, kicked off the event with a captivating presentation about his journeys into space. He orbited the earth 16 times a day in the international space station. From space, he saw the global challenges we all face, such as the impact of climate change, deforestation, erosion and urbanisation. All themes in which Royal Eijkelkamp is actively involved throughout the world.



Transfer of Management Responsibility

André Kuipers' presentation was followed by an official ceremony. Fons Eijkelkamp handed over the management of Royal Eijkelkamp to his son Huug Eijkelkamp (4th generation) and Frank Tillmann. They are now jointly responsible for the day-to-day management of the business. But this does not mean Fons plans to rest on his laurels in the future. Fons has joined the Supervisory Board and will continue to focus daily on business development and the Eijkelkamp Foundation's 'The Water Entrepreneur' project.

After the official part of the event, the afternoon programme was devoted to a wide range of workshops, demonstrations and presentations.



For an impression of the event, view our official YouTube channel: youtube.com/royaleijkelkamp

Natural disaster damage control with sonic



Pro-Drill in New Zealand drilled up to 275.000 meters with sonic and earth quake investigation is well complete now.

We don't know exactly where or when the next earthquake will happen. But we do have a very good idea which areas can experience earthquakes based on their geology. An earthquake can be especially devastating in areas with particular soil compositions. This also implies that the effect of earthquakes in these danger zones can be influenced, if we are able to improve the soil structure.

Soil liquefaction due to earthquakes

When saturated sand deposits are subjected to an earthquake, pore water pressure in the soil starts to progressively build up, which leads to loss of soil shear strength. This is when a saturated sandy soil can behave almost like a liquid. Major earthquakes which have occurred in the past years have demonstrated massive damaging effects because the soil liquefied.

Geotechnical investigation

Measuring is knowing, so we first need to know the composition of the soil and all its layers. There are various techniques such as seismic investigation and cone penetration testing, which can be used to do a preliminary research to identify the possible hazardous zones. Once identified, the exact composition of the soil

needs to be further investigated. Therefore, undisturbed soil samples need to be taken. Because most of these formations are complex overburden structures, geotechnical investigation can be very challenging. Traditional probing and drilling methods can result in refusal or cause poor core recovery rates. Using the Eijkelpamp SonicSampDrill drilling technique, refusal is a thing of the past and the core recovery rate will exceed 99%. The undisturbed soil samples give excellent insight into the structure and composition, making the identification of zones that can be improved easier.

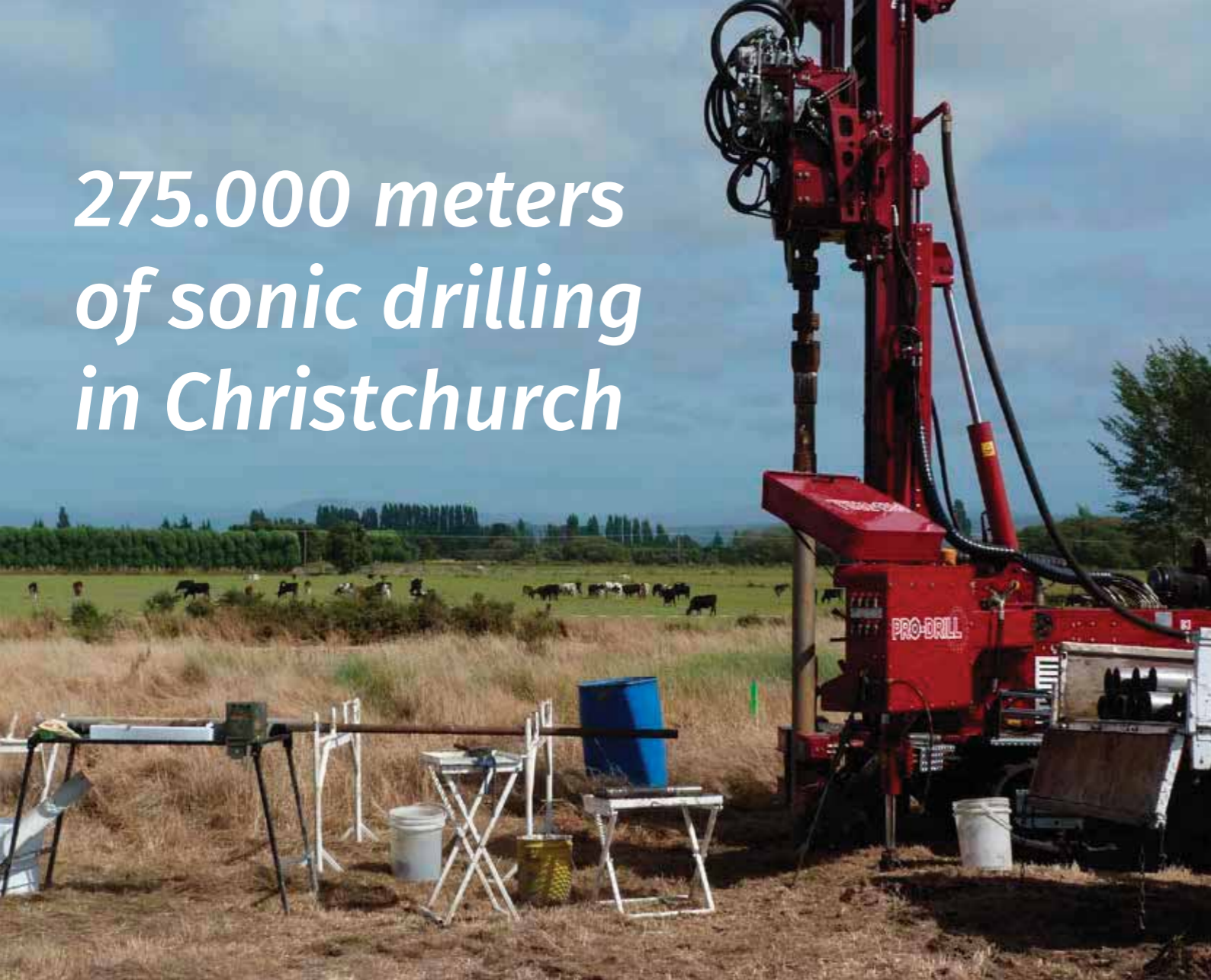
Soil stabilisation

Once identified, a plan can be made to improve the soil structure. Soil stabilisation measurements can be used in sand layers that are sensitive to liquefaction during an earthquake. The sand layers can be injected with silica grout to bind the sand particles into a solid material. For other soil types a jet grouting solution can be applied. The advantages of silica sand is that it is chemically and biologically inert, and non-toxic. Silica can be used in low concentrations for soil stabilisation purposes, which makes it cost-effective with respect to other methods of liquefaction remediation.

One rig that does it all

The various activities to identify and perform soil stabilisation methods are diverse. Traditionally several machines are needed, making this operation complicated and expensive. The Eijkelpamp SonicSampDrill drilling rigs are fully thought through and developed, making them highly versatile. From (sonic) CPT testing, undisturbed soil sampling to soil injection, all can be performed with one rig; eliminating the need for multiple rigs on site will result in significant savings.

275.000 meters of sonic drilling in Christchurch



The 2011 earthquake in Christchurch was a powerful natural event that severely damaged New Zealand's second-largest city, killing 185 people. A national state of emergency was in force until April 30, 2011. After that day the city became the focus of the biggest geotechnical investigation in the world. Like other New Zealand geotechnical drilling companies, Pro-Drill arrived in a devastated Christchurch.

'The scope of drilling was daunting,' Russell Sherwin, owner of Pro-Drill, says. The company brought three rotary rigs, all set up on HO triple-tube coring systems. The region's geology contains sands, silts and gravel; outwash from the Southern Alps some 100km to the west. There is a static water level of less

than one metre. After the first month's drilling, the company came to the conclusion that it had to find a better way of coring. The mud rotary HQ had an average of 40% recovery. Average daily production was 15m a day per drilling rig. Due to the abrasive nature of the formations, it was calculated that the entire drill string would need replacing every three months.

Sherwin spent the next six months researching sonic options, and in November 2011, Pro-Drill purchased an Eijkelkamp SonicSampDrill rig, which had only been on the market for 12 hours.

More rigs followed, including a nearly new Compact-RotoSonic XL, and Pro-Drill also commissioned the building of a new CompactRotoSonic XL from the



'By using sonic the core recovery went up to 100% and operating costs dropped by 75%'

Russell Sherwin, owner Pro-Drill

Netherlands. The new drilling rig was transported by air to New Zealand.

By April 2012, Pro-Drill had four Eijkelkamp SonicSampDrill rigs operating in Christchurch. A fifth CompactRotoSonic head sat in a crate as standby. Each rig came with on-site training to certify the driller. In an average eight-hour day, Pro-Drill managed to sample 40m, with standard penetration tests every 1.5m. A record day on one rig was 76m.

By using sonic the core recovery went up to 100% and operating costs dropped by 75%, the company says. 'We are now up to 275.000 meters of sonic drilling but earth quake investigation is well complete now.'



Devastation in the city centre of Christchurch, New Zealand.



From 6 Belgian knights to groundwater monitoring

Affligem Brewery uses Eijkelkamp Smart Sensing

Pieter Careel, Production Support Coördinator, at Affligem Brewery explains: 'The government is very careful about issuing environmental permits for pumping groundwater. We must be able to demonstrate that we use the water for high technology applications, something that brewing beer obviously is. Moreover, the legislature requires that we carefully and closely monitor the wells.'

'These strict regulations are in place because in the past, heavy industry has been careless with pumping groundwater. In some places, textile and carpet factories, for instance, have extracted all the groundwater from the soil.'

There are five active wells and two inactive wells on the site of Affligem. The law prescribes that all these wells must be monitored. One of our water wells is special because it is located at a depth of no less than 280

metres. This well provides the Affligem Brewery of the purest water for its brewing process.

'In the past, we measured the level of the groundwater manually. This is a very labour-intensive and time-consuming process. Therefore, we started looking for a better method to monitor our wells. Another brewery from our group had implemented a monitoring system. However, this was a wired system. Our wells are located far apart. Wiring the wells would have cost us a fortune. That is how we came into contact with Eijkelkamp Soil & Water because you also offer a wireless system.'

'Initially, we purchased one Diver water level logger (groundwater data logger). We used this Diver water level logger to monitor the five active wells one by one. However, repeatedly placing the Diver water level logger in a well, configuring it and reading it still took a lot of time. Therefore, we were quickly convinced of the added value of also equipping the other four wells with Divers. We also provided all locations with a Global Data Transmitter Single (modem). Law requires us to perform



Pieter Careel,
Production Support Coördinator at Affligem Brewery

'We save a hundred hours because all data is now automatically sent to the Eijkelkamp web portal. At the same time, we comply with all legal requirements'

Pieter Careel - Production Support Coördinator

one measurement per day. However, we measure every four hours. Not only do we report as part of our legal obligation, we also gain a lot more insight into our processes.'


drained. During that time, our two deepest wells were also completely drained. If we had already had the Eijkelkamp monitoring system, we could have raised the alarm much sooner.'

Experiences

'We must monitor wells when they are in operation as well as when they are not. However, the only times the wells for the cleaning water are not being used is during the weekend. Previously, that meant an employee sometimes had to perform a manual measurement on a Sunday afternoon. Now this process is fully automated, and no one needs to go to the brewery just to perform a measurement.'

'I estimate that we save a hundred hours a year in reading the measurement results. The fact that we no longer need to think about it because everything is automated is also a relief. Nowadays, we only need to log into the Eijkelkamp Web Portal to comply with our legal obligations. The necessary reports are waiting for us, and we only need to download them and send them to the government.'

'Before I joined Affligem, many new buildings were built in the area. In many cases, the construction pits were

 For the video, view our official YouTube channel: youtube.com/royaleijkelkamp

Affligem Brewery

In 1074, six Belgian knights swap their swords for monk's robes and they dedicate their lives to peace. Their first task? Building an abbey in the Belgian village of Affligem. Shortly after this, the monks start brewing beer in the abbey. More than 900 years later, the Affligem brewery still exists and is now part of the Heineken brewery group. The Affligem Brewery is characterised by high fermentation beers. Affligem wins many awards for its beer. The most recent award was that of 'World's Best Pale Beer 2016'.

For more information, please visit affligembeer.com



Eijkelkamp GeoPoint Soil Solutions opens up a world of CPT opportunities

Introduction of Eijkelkamp GeoPoint Soil Solutions at The World of Royal Eijkelkamp event.

Eijkelkamp GeoPoint Soil Solutions was officially introduced during the World of Royal Eijkelkamp event. Eijkelkamp GeoPoint Soil Solutions was created when Eijkelkamp SonicSampDrill and GeoPoint Systems together developed a unique concept designed to integrate Cone Penetration Testing (CPT) into sonic drilling systems. Eijkelkamp GeoPoint Soil Solutions focuses on developing and manufacturing SonicCPT tooling, smart sensing, accessories and SonicCPT-related rigs, such as the recently developed CompactCPTCrawler.

The founders of Eijkelkamp GeoPoint Soil Solutions; Huug Eijkelkamp, Ruud Mosterd and Ferry Hoogveld enthusiastically explain why this combination of various innovative technologies is groundbreaking. 'The CPT



market is extremely conservative. The 'Dutch Cone', or the CPT cone, is a Dutch invention that is increasingly being used throughout the world, even with the current geology-related limitations. Eijkelkamp GeoPoint Soil Solutions thinks outside the box and in terms of possibilities. This way, the technology is becoming better and faster, and furthermore it can be used in any type of soil.'



The Drill'n CPT mounted on the MidRotoSonic XL, ready for work.

'The possibilities that are created by combining sonic and CPT are unimaginable.'

Huug Eijkelkamp

'It should be noted that this is not just a merger of companies to create a new entity; it also brings two different worlds together. Combining forces has resulted in a one-stop shop for developing, selling, training and maintaining CPT and related geotechnical and environmental products. Eijkelkamp GeoPoint Soil Solutions has the largest product range of geotechnical and environmental cones in the industry and is represented throughout the world for even faster delivery and local support.'

'It is good to see that our new concept responds to a major need. This enables our customers to do their work even more efficiently. The revolutionary Drill'n CPT unit, for example, makes it possible for drilling companies to easily convert their drilling rig into a CPT rig. This translates into multi-purpose applications and reduced overhead costs. In other words, good news for geo-engineering companies specialising in foundation inspections, the mining industry, and for CPT and drilling companies. You can now do far more with smaller, lighter machines. Our smart CPT concepts are going to conquer the market.'



The revolutionary Drill'n CPT at work on a SmallRotoSonic PL.

SonicCPT starts off where standard CPT technology stops!

The revolutionary and patented SonicCPT system is developed in collaboration with Eijkelkamp SonicSampDrill. With SonicCPT, 2 technologies can be combined: standard CPT and sonic vibration. At the point that too high pressure or friction is being experienced, sonic vibration is used during the CPT process. As soon as the overburden is lifted, the standard CPT process is resumed. Difficult soils that cause refusal with standard techniques can now be handled.

The adjusted CPT cone produces standard CPT data during static pushing and indicative values during the sonic vibrations.

Fons Eijkelkamp always looks ahead

During The World of Royal Eijkelkamp event, Fons Eijkelkamp officially transferred the day-to-day management of Royal Eijkelkamp to Huug Eijkelkamp and Frank Tillmann. It was a special moment for someone who almost 50 years ago started working in the company and who stood at its helm for many decades.

But this is not a farewell for Fons Eijkelkamp by any means. Fons has joined the Supervisory Board and continues to focus daily on Business Development and the Eijkelkamp Foundation's 'The Water Entrepreneur' project. 'There is no point looking back on years gone by, I want to look ahead and speak about my view of Royal Eijkelkamp's future.'

'Now that there is an excellent Technical Manager at Eijkelkamp SonicSampDrill, and Huug and Frank have taken on the day-to-day management, I have the space I need to start up new activities. For example, the ambitious project we are starting up with partners such as Mott Macdonald, Grundfos and the Rabobank in which we are focusing on optimising the entire supply chain in the agrofood sector, for example in the Sahel countries Senegal and Mali.

'By way of example, we are in contact with a peanut processing company with a capacity for processing

'This project is fully in line with the Sustainable Development Goals of the United Nations.'

100,000 tonnes of peanuts per year, but which is currently unable to exceed 20,000 to 30,000 tonnes. We want to transfer knowledge and expertise to this customer, whereby soil and water data is of vital importance. Furthermore, we are adopting an extremely broad approach. This means that we do not only make sure that production increases, but also that employees are and stay healthy, that there is sufficient drinking water and that employees are trained. Naturally, we cannot do all of this by ourselves and this is why we are developing a network of primarily Dutch knowledge and expertise. Alone, we are niche players, as an alliance, we are unbeatable!'



'This project is fully in line with the Sustainable Development Goals of the United Nations. These Sustainable Development Goals consist of 17 main goals designed to make the world a better place for everyone. The Sustainable Development Goals run until 2030 and are ultimately meant to put an end to key themes such as poverty, inequality, food problems and climate change. As mentioned earlier, we are ambitious and this is anything but a simple project we are jointly undertaking, but we are staying focused on the dot on the horizon. We know this is going to take a long time and that we will encounter setbacks along the way, but this is the only way to learn and to ultimately get ahead. I foresee this will become Eijkelkamp's future.'

'Projects of this nature will ultimately determine the type of solutions we will be offering customers. Naturally, with a continued focus on soil and water. However, we will have to look for partners. Make new technologies our own. Link existing sensor networks to our system. When there are sensors we do not have, we will purchase them, and if they are not for sale, we will make them ourselves.'

'Furthermore, I think the Eijkelkamp Foundation has

a key role to play. As a result of our project in Benin alone, we have met with many different parties this past year. Generally, parties with whom we would never have been in contact if it had not been for our The Water Entrepreneur project. This is why I always maintain that you must first and foremost work together. In the Netherlands we are very good at staying put in the same place. But you have to look beyond your own market. This is something that I already observed when we launched the MAREC formula (see marecgroup.com) together with Witteveen+Bos and Royal IHC. Together you can do far more than you can all alone.'

'Together you can do far more than you can all alone.'

'This way of thinking, cooperating, combining forces, sharing information and especially just DOING gives me so much energy, especially because it produces a great deal of success!'

Complete Water Balance for Rijnland Water Authority

In May 2017, the Rijnland Water Authority started using measuring equipment that helps provide better insight into the impact of climate change on water management. This involves three Eijkelkamp Smart Lysimeter measuring stations, which in addition to evapotranspiration data also provide data about the amount of precipitation, wind and soil moisture.

‘Why did we acquire three Eijkelkamp Smart Lysimeter stations?’ Jan Willem van Kempen, Water Level Manager, and René van der Zwan, Advisor Policy and Research, both employed by the Rijnland Water Authority, explain: ‘On the one hand, our work involves operational water level management, and on the other hand it is clear that water level management in part is under pressure due to climate change. Climate change is a very high priority for the Rijnland Water Authority.’



Jan Willem van Kempen (l) and René van der Zwan (r).

‘We use an automated decision support system for our water level management operations. This system is supplied with a wide range of measurement information, including water levels and precipitation. The only key item into which we do not have good insight is water evapotranspiration. In fact, this is a big question mark for us, especially after dry and during wet periods. Up until now, we used models to obtain this information. But how good is your model and, furthermore, it requires a certain period of synchronisation. Enough for us to ask ourselves, how do we complete the water balance equation?’

‘We contacted Eijkelkamp Soil & Water because we wanted to acquire a practical lysimeter station rather than a large 20 x 5 metre concrete reservoir. The latter is not easy to install and is difficult to maintain. Furthermore, Eijkelkamp Soil & Water had already installed a surface water monitoring network for us. We are going to use the web portal designed for this purpose for the evapotranspiration data as well.’

‘The management of water levels is in part under pressure due to climate change.’

René van der Zwan -
Advisor Policy and Research, Rijnland Water Authority

‘With this combination of measuring stations, the Rijnland Water Authority has taken a leading role in water management in the Netherlands’

Pioneering Role for Rijnland

‘Together with Eijkelkamp Soil & Water, we ultimately installed a lysimeter measuring station at three sites: in Noordwijkerhout on sandy soil, in Woubrugge on clay soil and in Reeuwijk on peat soil. With these three sites we are covering off our three main soil types and together with a meteorological station, and soil moisture and groundwater measurements we now have a unique combination of measuring stations. As such, the Rijnland Water Authority has taken a leading role in water management in the Netherlands.’

‘It is interesting to see that the ‘Netherlands Inc.’ is

now looking at our initiative from a variety of angles. In addition, we are receiving lots of requests to be allowed to view the results as we progress. In the context of big data, we are definitely interested in sharing our information, just like we do with water levels.’

Smart Water Level Management on the basis of Evapotranspiration Data

‘One of the meters is located in Reeuwijk. A project is currently underway here for the flexible water level management of the Reeuwijkse lakes. We noticed that there is a tremendous lack of knowledge among

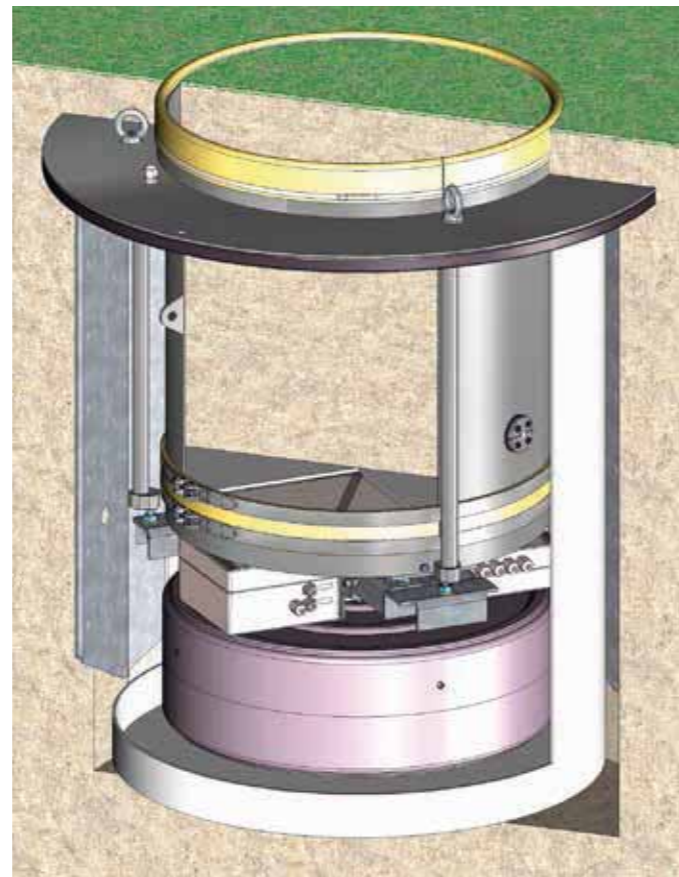


The only thing you see of an installed Eijkelkamp Smart Lysimeter.




residents concerning the effect of evapotranspiration on groundwater levels. At one time, we carried out a project together with residents designed to measure surface water levels and groundwater levels to provide insight into what causes the differences. The surface water level fluctuated within a range of 5 to 10 cm. By contrast, a few metres away, the groundwater fluctuated between 50 to 60 cm. This completely mystified residents. Until you use an evapotranspiration and a precipitation meter to show them how many mm of rain fell and how many mm evaporated from the soil. Ultimately, we are getting a better picture of the water demand in our system under dry conditions. When it rains, does this immediately result in runoff or is the water first stored within the soil?’

‘Another example. We are currently working on the renovation of a pumping station, as a result of which, we are losing some capacity. To offset this loss, you can attempt to anticipate future conditions. The drawback of doing this, most certainly in the summer, is that you could end up pumping out valuable water that you might very well need a few days later. At that point, it may almost be impossible to get it back, particularly when the Rhine or Moselle rivers are low and the main system has become brackish. But when you know what the groundwater level is and the soil has a very high storage capacity, you do not need to anticipate a rain shower and pump out valuable water. This way, we will be able to engage in smart water level management in the near future.’



Profile of the Eijkelkamp Smart Lysimeter

 For the video, view our official YouTube channel: [youtube.com/royaleijkelkamp](https://www.youtube.com/royaleijkelkamp)

Rijnland Water Authority

The Rijnland Water Authority has been providing for safe dikes, clean and healthy water in lakes and ditches, and for balanced water levels, since 1255. Furthermore, it also purifies the wastewater generated by all of the households and companies in its area of operations. This area stretches from IJmuiden to Gouda and from Wassenaar to Amsterdam. It comprises 1,175 km² and over 1.3 million inhabitants.

A Dutch first in the polder

Water Board Zuiderzeeland measures flow rates to achieve sustainability



The Dutch province of Flevoland lies metres below sea-level. That’s why rain and seepage need to be removed from the polder, some 6 metres up. And that’s the reason Flevoland is drained continuously by seven huge pumping stations. The quantity of energy involved in this is as great as the energy consumption of 4,000 households. Water Board Zuiderzeeland has launched the ‘Energy & pumping’ project to make the polder drainage sustainable. Eijkelkamp Soil & Water has fitted one of the pumping stations, Colijn with flow-rate measuring equipment to this end. It’s a first!

Albert Koffeman, Engineer/Pumping Station Manager at Water Board Zuiderzeeland, explains: ‘Ultimately, it comes down to CO₂ reduction. Of all the energy we use as a water board, 65% goes towards Flevoland’s drainage. If we could save on this, or if we could use renewable energy for it, that would have a positive effect on the Water Board’s CO₂ emissions. In doing so, we would contribute to a more future-proof Flevoland.’

Calculating vs. measuring

‘In fact, we have turned the Colijn pumping station into a test bed. We are constantly considering how to improve our processes, with sustainability as the objective. To monitor the pumping process properly, we approached Eijkelkamp Soil & Water. We did some engineering with Eijkelkamp, and we developed a



Albert Koffeman, Engineer/Pumping Station Manager at Water Board Zuiderzeeland



Colijn pumping station

measuring system based on the transit time method and equipment from NIVUS. This measuring system lets us monitor the flow rate of one of the three pumps installed in the pumping station. It's an enormous flow rate: 450 cubic metres per minute. We use 8 NIVUS sensors mounted in the delivery tunnel to perform these measurements.

'Our measuring system is already operational and the results are truly spectacular. We have a view of the displacement of this pump per minute, per hour and per day, down to one decimal place. This data

'The results of the measuring system are truly spectacular'

Albert Koffeman - Water Board Zuiderzeeland



will soon be added to our database and will be used to prepare graphs and reports, and for testing purposes.'

Good collaboration achieved the country's first

'We previously calculated the flow rate. Now we measure it, which is a huge difference. Calculations were performed based on the original pump curves from the pump manufacturer, and based on a 1996 measurement using a flow-rate meter by Ott. The advantage of the transit time method is that it's a contactless measurement. An audio signal is sent out through the water, and you work with that.'

'The transit time principle is ideal for permanent measurement systems where you want to monitor the flow rate accurately under various conditions. So previously we used calculations based on pump curves. However, these are based on measurements



We use 8 NIVUS sensors mounted in the delivery tunnel'



'The objective is that the Vissering Pumping Station becomes the best in the world.'

taken under optimum conditions, and you don't always have that during normal operations. For instance duckweed could be transported, and similar.'

'The flow-rate measuring system we now use is a result of extremely good collaboration between the Water Board and Eijkelpamp Soil & Water, despite us not having seen each other often or much. Two sessions was all it took. We needed someone with a great deal of knowledge of what they manage, and who knows what they want. And at Eijkelpamp Soil & Water they knew very well indeed what was possible, and what could be delivered. The staff of Eijkelpamp Soil & Water also have a very practical orientation, and they know how to tackle things.'

'I think we have achieved a Dutch first together. That's because I don't believe any other flow-rate meter system has been installed in the tunnel of such a large pump which is pumping between 460 and 480 cubic metres a minute. And we can now

measure this with enormous precision.'

World's best pumping station

'Alongside the new flow-rate measurement system, we are also using advanced energy meters. Combining the measured data acquired makes it possible to present and analyse the output of the pump installation continuously.'

'We are going to use all the experience and knowledge we now gain, with other pumping stations, such as the Vissering Pumping Station in Urk, which we will be renovating fully in 2018. New motors will be installed there. We are going to improve the pumps. Ultimately, we will be applying innovations whereby the Water Board's objective is to create one of the best pumping stations in the Netherlands, Europe and the world!'



For the video, view our official YouTube channel: youtube.com/royaleijkelpamp

Water Board Zuiderzeeland

Water Board Zuiderzeeland is the water manager in Flevoland and a small part of Friesland and Overijssel. In this area, Water Board Zuiderzeeland is responsible for all the dykes, waterways, pumping stations and water purification plants. The water board thus ensures safety and sufficient and clean water.



High 5 Solutions launches Sonic Screw Injection Bar Anchors

For the redevelopment of the Strand East area in London, High 5 Solutions was asked by Van 't Hek Projects B.V. to actively contribute ideas for an anchoring solution for a new quay wall construction.

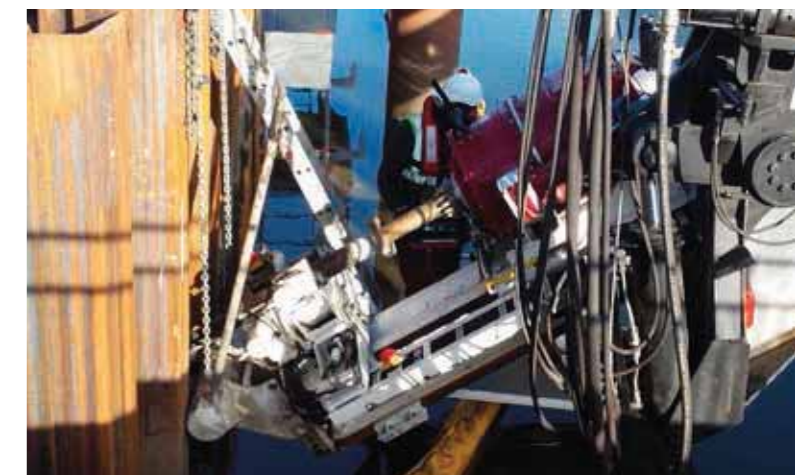
In this project there is only a limited bearing layer and therefore a high tractive effort in slow moving speed is needed. High 5 Solutions designed a new and patented anchor to achieve all this, the so-called Sonic Screw Injection Bar Anchor. This anchor is capable of creating a high tractive effort over a short distance thanks to its large grout body diameter.

Prior to the execution, six anchors were installed to do some failure tests. After proven adequacy the anchors were taken into production and since then more than 300 anchors have been successfully installed.

During the project the sonic drilling technology proved itself. Less power is needed to install the anchors. This makes it possible to reach speeds, depths and diameters that normally require a much bigger rig. Due to the efficiency of the drilling technology also on this project the production speed increased better than expected.

The Cat 336F brings enough stability to carry the drill mast. In combination with the mast and additional weight on the back of the excavator this unit weighs approx. 48 ton. During transport the mast doesn't need to be taken off the excavator. Besides anchor drilling H5S uses this unit for compensation grouting, micro piling, well installation, dewatering drilling, soil injections and stitch drilling through old constructions. Depths of over 100m have been reached. It is not a challenge to install 300 ton anchors with a diameter of up to 600mm.

H5S choose for sonic as it increases productivity of 2,5 to 3 times compared to conventional anchor drilling technologies, it goes through all overburden material and has no deviation. For H5S sonic drilling is a winner and will lead to a revolution on the foundation market.



High 5 Solutions

High 5 Solutions, also known as H5S, is a young and innovative company. It combines the experience of 5 entrepreneurs. All bringing in the knowledge gained in different business to be able of providing a full solution to the clients. Background of the entrepreneurs is in engineering, heavy haulage, ground improvement and soil sealing, manufacturing, foundation drilling and tunnelling.

For their drilling H5S only uses Eijkelkamp SonicSampDrill equipment. Their fleet consists of a CompactRotoSonic Mito as well as 3 LargeRotoSonic Excavator Drill Masts that are mounted to Cat 336F excavators.

More at h5s.com



The Water Entrepreneur Update



In Benin, in West Africa, almost half of the population is forced to rely on water from rivers, ponds and wells. This water is generally polluted and therefore highly unsafe. This forms one of the largest threats to population health, especially that of young children.

This is why the Eijkelkamp Foundation initiated the Water Entrepreneur project in 2014. The objective of the project is to train 40 Water Entrepreneurs, each of whom will be given 4 Water Access Points to manage in order to provide Benin's rural population with access to clean and safe drinking water. By providing these Water Entrepreneurs income by allowing them to sell the water produced by their Water Access Points, the responsibility for the maintenance and quality of the water access points is guaranteed.

Currently, 10 Water Entrepreneurs have been trained and are active in Benin, and 5 Water Access Points have been implemented. This fully provides over 2,000 residents of the Alibori department (North Benin) with clean drinking water. The initial results have therefore been achieved. But we are still far from the ultimate goal of providing 100,000 Benin inhabitants with safe drinking water. We therefore continue to work on the project with a great deal of energy and can use all available support.



Rotary Support

Rotary Op Seyst has been supporting the Water Entrepreneur project since 2015. For example, an Autumn Concert was organised on two occasions, during which almost € 25,000 was collected for the project. In November 2017, a delegation of the Rotary Op Seyst visited Benin and met the 10 Water Entrepreneurs and visited the various Water Access Points.

Interested in Helping?

If you would also like to support this project, contact the Eijkelkamp Foundation and make a difference. For example, it is possible to support one or more Water Entrepreneurs. Or would you like to realise the construction of a Water Access Point? That is possible as well. Send an e-mail to foundation@eijkelkamp.com. We will contact you immediately to discuss the options.



This woman shows her tag with credits with which she can buy clean water.



The Rotary delegation visiting a Water Access Point in Benin.



'We are concerned about Flemish water quality 24/7'

Smart Sensoring used for creating a better living environment.

The Flemish Environmental Agency (VMM) devotes its efforts to helping create a better living environment in Flanders, Belgium. Since 2000, Ward De Cooman has been employed by this Flemish government agency. 'At VMM, people are concerned about water quality 24/7. We are continuously analysing and reporting on the water's condition.' Since the beginning of 2017, Ward and his team have been deploying Eijkelkamp Soil & Water's Smart Sensoring to get an even better grip on Flemish water quality.

'To achieve and maintain high water quality, it is of major importance to be able to respond to disasters that can affect water quality as quickly as possible. Things that come to mind here are oil pollution caused by shipping, for example, or overflowing drain pits in automotive garages. The discharge of manure, silage effluents and farmyard discharges cause water quality problems in Flanders. Farmers ensile corn. In the past, this was done on the land. Nowadays, this is often done on the farmyard in concrete troughs. Silage effluents often seep from these troughs and end up in creeks. The watercourse then crashes within a few hours, and becomes smelly and dirty. All factors that affect the water's quality.'

Passion for Water Quality

'At VMM, we monitor the quality of surface water. Flanders has more than 20,000 kilometres of waterways, but we are all very passionate about our work. One of our Special Water Analysts is a fervent cyclist. When he goes biking, he stops every



Ward De Cooman from the Flemish Environmental Agency.

fifteen minutes because he has spotted something suspicious in a creek. The Monday after a biking weekend, he invariably comes back with a list of sites where there is something wrong.'

'In 2011, we were involved in 85 site investigations and 206 incidents. For 121 of these, we are maintaining a dossier. By 2016, this number had grown to 714 incidents with almost 200 site investigations. The main reason behind this increase, is that we now are better known. People know where to find us and we have also gained a lot of experience.'

On-site within two hours

'It is important for us to be on-site as fast as possible. Our aim is to be on-site within two hours to monitor the disaster, for example, by taking samples. This is a considerable challenge. Furthermore, we use a sampling scoop and we often have a single sample and therefore only a single analysis result. In certain situations, this may provide too little information for creating a supporting dossier that properly describes the incident.' 'We therefore started looking for a new technology to chart incidents. We ended up with Eijkelkamp Soil & Water's multiparameter probes, which enable us to measure various parameters at any desired time. We use these probes to measure oxygen, temperature and pH every fifteen minutes, for example. This way we do not need to be immediately on-site but still have the needed measurements very quickly. The multiparameter probes help us with this.'

The future lies in continuous measurement


'By working with the multiparameter probes, we are able to take continuous measurements and to acquire a lot more data with the same effort. We are now able to support our actions with thousands pieces of data rather than just one. Furthermore, the probes register the time, completed calibrations and the x and y coordinates; something that is very important. All of this data is received by our own system via telemetry.'



'I'd rather have 10 probes in the creek, than 1 in the closet.'

Ward De Cooman - Flemish Environmental Agency

'In 2016, we purchased 10 probes, four of which have been installed for a European INTERREG project. We will also be deploying them as part of the Winterbeek Project. This is a beautiful, 15-kilometre long meandering creek that has been used as a dumping ground for years. The polluted water bottom will be excavated as part of this decontamination project. In this project, the contractor must stay below specific turbidity values. The probes help us monitor this carefully. I could keep going with sites where we deployed the probes. In other words, 10 probes is really too few. But we have to start somewhere and I would rather have the probes suspended in a creek, than having one hanging in a closet.'

 For the video, view our official YouTube channel: youtube.com/royaleijkelkamp

Flemish Environmental Agency

Day after day, the Flemish Environmental Agency devotes its efforts to helping create a better living environment in Flanders, Belgium. As an agency of the Flanders government, the Flemish Environmental Agency forms part of the Environment policy domain. Its core activities focus on clean water, clean air and in-depth environmental reporting.

Aeres University of Applied Sciences in Dronten and Royal Eijkelkamp start up unique Soil Research Lab



Dronten Faculty of the Aeres University of Applied Sciences



Starting in January 2018, there will be a brand new 'Aeres Eijkelkamp Soil Research Lab' for students at the Aeres University of Applied Sciences campus in Dronten. This lab contains everything needed to enable students enrolled in the agricultural business programme to conduct effective and reliable soil physics research using the best possible measuring devices. Martin Duijkers, Head Practice-based Learning at the Aeres University of Applied Sciences and one of the initiators of the lab, explains why its construction is so important.

'There remain very few well-equipped soil physics laboratories in the Netherlands. The completeness of our new lab in the soil physics domain is unique in the Netherlands. Ranging from a membrane press, a full set of pF measuring devices, a calcimeter and permeameter to the wet sieving method, the lab has everything. But what is especially unique, not only in the Netherlands, but throughout the world, is this form of collaboration between the business

community, education and research projects.'

'As for myself, I have had an excellent relationship with Royal Eijkelkamp for more than 30 years. Our students and lecturers use equipment provided by Eijkelkamp Soil & Water and for years I have organised courses for the Eijkelkamp Academy in the Netherlands and in Belgium. With the arrival of Frank Tillmann at Royal Eijkelkamp, fresh ideas about new forms of collaboration were put on the table. Together with Eijkelkamp Academy staff, we came to the conclusion that it would be good to operate a Soil Lab together.'



Students at work in the Aeres Eijkelkamp Soil Research Lab



Martin Duijkers

'This form of collaboration between the business community, education and research projects is unique in the world.'

Martin Duijkers – Aeres University of Applied Sciences in Dronten

'The lab will be used by students in almost all study programmes of the Aeres University of Applied Sciences because the soil engineering subjects are embedded in a logical progression in all curricula. You will most often find 3rd and 4th year students here, however, because they also use the equipment to conduct measurements for various projects.'



'The lab offers our students a tremendous opportunity of working with state-of-the-art research equipment and to become familiar with Eijkelkamp's products this way. Royal Eijkelkamp now has an actively functioning lab in the Netherlands where existing and potential customers can go for training, workshops and demonstrations. Furthermore, this way it is much easier for Royal Eijkelkamp to participate in new soil engineering projects of the Aeres University of Applied Sciences and to become acquainted with future soil engineering professionals.'

Aeres University of Applied Sciences

Aeres University of Applied Sciences is the University of Applied Sciences of choice for green and higher professional education studies and has three faculties respectively located in the cities Almere, Dronten and Wageningen. The faculty in Dronten has been providing study programmes in the area of Entrepreneurship, Business Administration, Animal and Food Sciences for over 60 years. The faculty in Wageningen centres on Education and Knowledge Management, while the faculty in Almere focuses on Food, Nature & Urban Green. Aeres University of Applied Sciences is part of Aeres; a green knowledge institute that offers education at all levels ranging from pre-vocational secondary education to higher professional education.

DAMSAFE Project

Innovative technologies for enhancing dam safety and water management in India

Multi-purpose water reservoirs and dams play a major role for water and power supply, irrigation and flood protection in India. In order to ensure long-term operation and safety of the dams, adaptation planning, maintenance, repair and retrofitting are needed. DAMSAFE is a demonstration project sponsored by the Dutch Partners for Water program and supports decision making in a long-term integrated approach. Besides Royal Eijkelpkamp the DAMSAFE consortium consists of the Dutch based research organisations Deltares, SkyGeo and the Spanish company iPresas.

The water reservoirs in India are of vital importance to the cities and agricultural areas. They provide water for irrigation of the land (food production), are used to generate electricity (water and energy) and offer protection against flooding (safety). Often, the dams are aging, but due to changes in land use, socio-economic developments and climate change dams are also facing new challenges. The goal of DAMSAFE is to contribute, to enhancing dam safety and water management in India. Innovative tools help in forecasting reservoir inflow and outflow, thus increasing reservoir performance and more controlled release of water in the environment.



They allow assessment of the dam condition resulting in optimization of Operation and Maintenance, while rapid and risk based assessment of dam safety provides information for emergency response.

The DAMSAFE approach is adopted to the Bhadra dam, constructed across Bhadra River in the Karnataka State, southern India.

Innovative technologies

Different technologies, that have been developed and proven elsewhere, provide high quality and reliable information to the end-user. They are implemented in an integrated manner in DAMSAFE.

In the DAMSAFE project Royal Eijkelpkamp is responsible for the online monitoring system that enables monitoring of the weather (e.g. rainfall), the dam, the surface water levels and water quality in the reservoir.

Read more about the DAMSAFE project at www.damsafe.eu



The Limitless Horizon of Eijkelkamp SonicSampDrill

During the World of Royal Eijkelkamp event, Marco Lichtenberg, Technical Manager at Eijkelkamp SonicSampDrill, presented a future and near future outlook on the basis of a number of groundbreaking innovations.

Real-time Data Exchange

'In a world in which increasingly more systems are linked together and are collaborating digitally, data exchange relating to sonic drilling rigs and the soil sampling process is playing an increasingly more prominent role as well. At the present time, we are already capable of displaying and logging the most important drilling parameters during the drilling process, as well as storing it for subsequent analysis.'

'However, the trend is that we also will be using this information real-time. This means that we will immediately analyse current drilling conditions online, if applicable match it with data from previous drillings (anywhere in the world), and as such will be able to provide the operator with the best matching parameter set for the geology being sampled at that point in time. This way, the sonic drill is deployed in the most efficient way possible.'

'So we can offer our customers this technological headstart, we continue working on various developments which enable the required data to be collected and stored in the Eijkelkamp Cloud.'

'By automatically matching the data acquired during previous drillings and analyses with other information, such as current satellite data, drone recordings and radar images, we will be able to carry out semi-automatic and fully automatic drillings in the near future.'

Augmented Reality

'Of course, Sonic Horizon also devotes attention to the operators and on-site service engineers of our sonic drills. Using technologies, such as Augmented Reality, which adds projections, video and/or other images, and other directions to reality, we can in the future provide instructions that precisely match current customer demand.'

'For example, while conducting a complex (trial) drilling or while conducting on-site service activities. The customer puts on his AR glasses and looks at the machine, while the relevant components or actions automatically light up in the right step-by-step sequence. This way we will always be able to remotely offer the right support, independent of where in the world the machine is located at that point in time.'

Smart Mining

'As part of our participation in the EU's H2020 SOLSA Project (www.solsa-mining.eu), we will also be matching available drilling parameters and linking them to the field analysis of the sample just taken, in real-time. This makes it possible to extremely quickly determine the contents, and as such the geological value, of the sample taken. This saves a great deal of valuable time. Time that otherwise is lost during the generally required logistics actions relating to a soil sample. This Smart Mining approach seamlessly fits into Royal Eijkelkamp's world of thought.'

Future proof

As you can see, we are always investigating whether new technologies and developments can provide added value to our soil and water-related solutions. With the innovations shown here together with new innovations in the area of efficiency & connectivity, you are assured that your Royal Eijkelkamp equipment is future-proof.



3D metal printing? Royal Eijkelkamp is doing it!

Royal Eijkelkamp, together with a number of other companies in the Achterhoek, a region in the Province of Gelderland, is using one of the most recent and most advanced 3D metal printers suitable for the serial production of functional end-products. This is the same 3D metal printer used by BMW and the Sauber F1 Team. The Airbus aircraft manufacturer uses this printer for the development and production of hi-tech, lightweight components for its latest aircrafts.

By entering into a partnership with other companies, Royal Eijkelkamp now has the opportunity of working with this highly advanced machine. In addition, the partnership yields other benefits as well. Engineers in the different companies share their findings relating to various production applications. This speeds up and increases the collection of knowledge about the possibilities offered by 3D metal printing.

New way of thinking and working

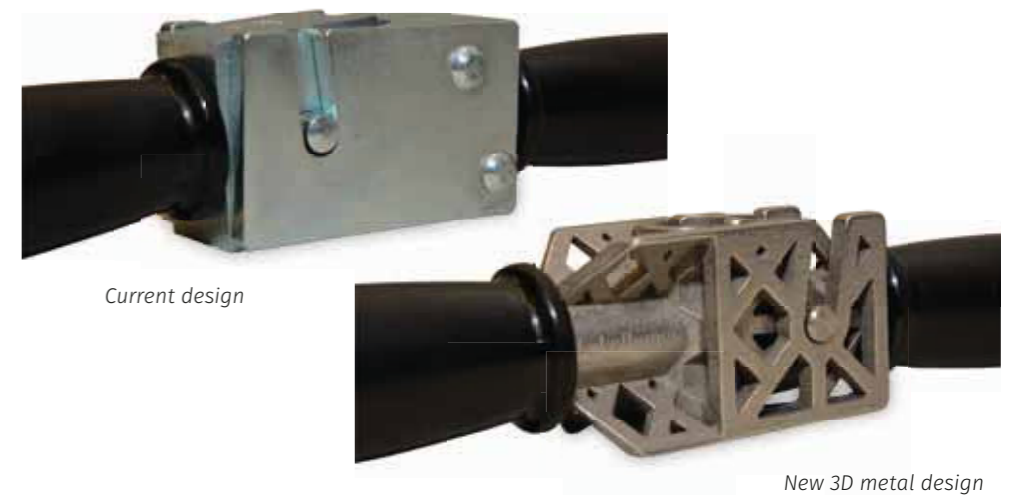
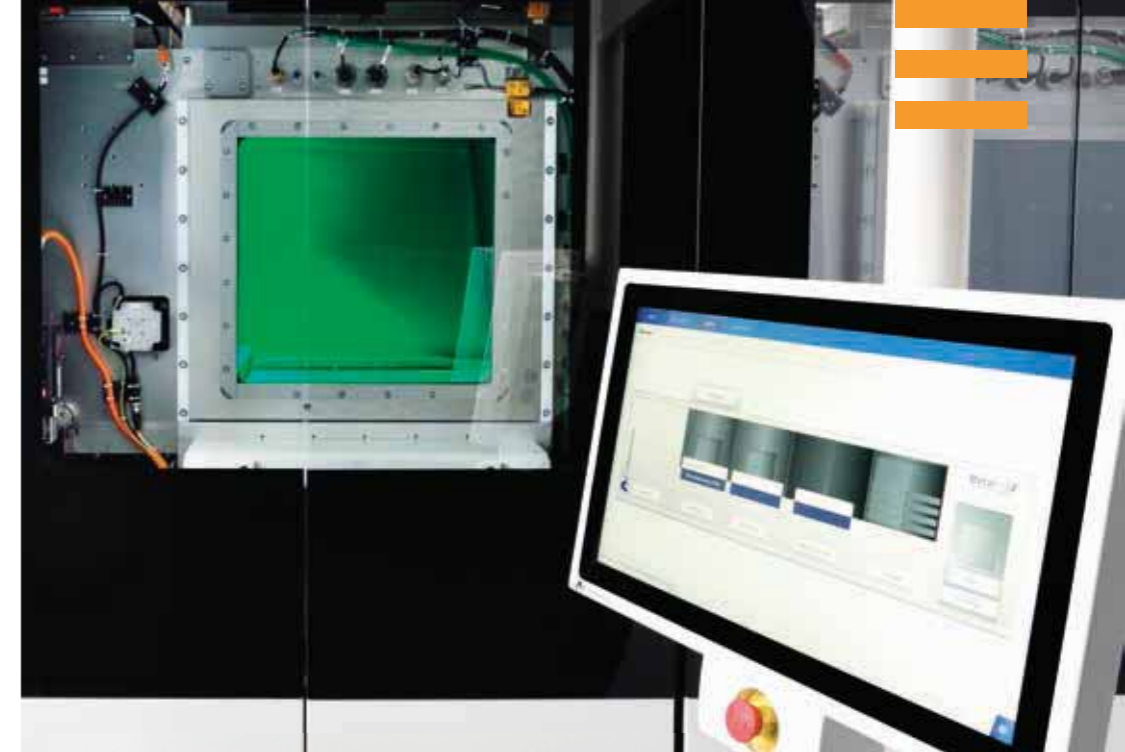
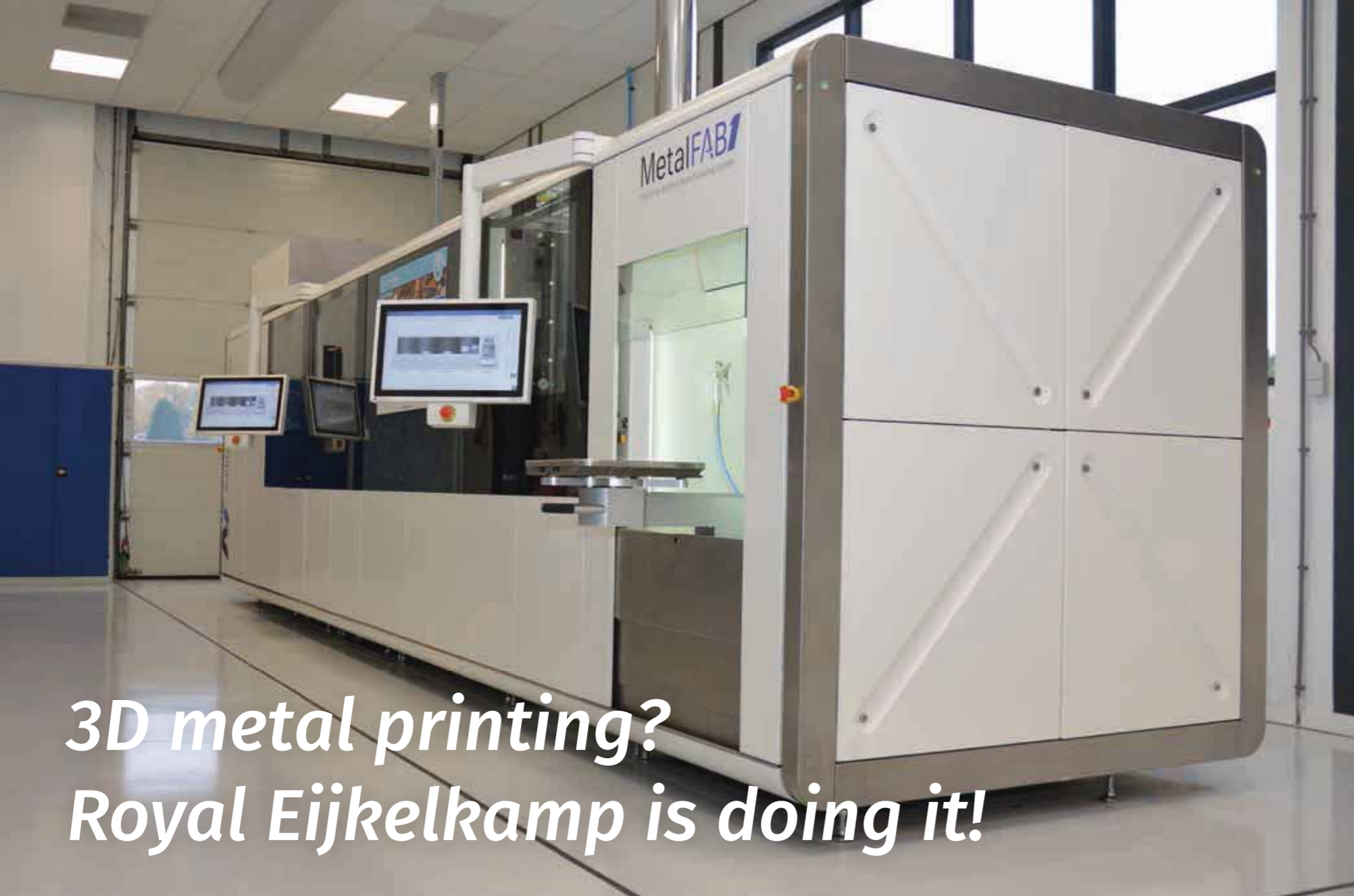
Jan-Egbert Pors, Mechanical Engineer at Royal Eijkelkamp, took a critical look at existing products: 'The arrival of this 3D innovation means we have to start thinking and working in different ways. We

are now capable of building up our products in a new and revolutionary way. We have a number of highly labour-intensive products in our portfolio. In comparison to conventional machining technologies, 3D metal printing offers many opportunities. This includes energy, material and weight reductions and freer design because fewer parts are needed due to function integration.'

'On the other hand, 3D metal printing is still very expensive. A key area for attention is to identify the cost components for investment and for production in order to start producing specific products using this technology. The expectation is that the process

will become cheaper in the future as 3D metal printing becomes increasingly more mainstream.'

'However, what is most important is that we, as Royal Eijkelkamp, are open to innovation and want to be frontrunners. 3D metal printing must become standard practice, so that we do not allow ourselves to be constrained by conventional technologies.'



Where can we meet each other?

Royal Eijkelkamp participates in events such as exhibitions, conferences and seminars throughout the world. We have already scheduled various such events for 2018. For an up-to-date overview, visit royaleijkelkamp.com.

Event	When	Where	Info
Bauma Conexpo South-Africa	13 - 16 March	Johannesburg Expo Centre, South Africa	www.bcafrica.com
IFAT München	14 - 18 May	Messe München, Germany	www.ifat.de
TCEQ	15 - 16 May	Austin, USA	www.tceq.texas.gov
South Atlantic JUBILEE	28 - 30 July	Myrtle Beach, USA	www.jubileewatershow.com
Georgia Environmental Conference	22 - 24 August	Jekyll Island, USA	www.georgiaenet.com
WEFTEC	29 September - 3 October	New Orleans Morial Convention Center, USA	www.weftec.org

Royal Eijkelkamp

Personal attention and a unique range of solutions: for more than 100 years, this has been our trademark at Royal Eijkelkamp. Royal Eijkelkamp has been devising, developing, producing and delivering smart solutions for soil and water projects worldwide since 1911.

These innovative solutions, together with the existing knowledge and expertise of our soil and water specialists, have served to raise projects to a higher level. From field measurement equipment to smart sensing & sampling and from Edelman augers to sonic drilling machines, Royal Eijkelkamp has quite the product range on offer.



Royal Eijkelkamp is involved in the following themes: Land Degradation, Food Security, Natural Resources, Land Development, Urbanisation and Pollution.


Meet the difference

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Volg Royal Eijkelkamp

Royal Eijkelkamp is active on the following social media:

