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Magazine of Dispuut Geo-Engineering "De Ondergrondse"



Witteveen  Bos

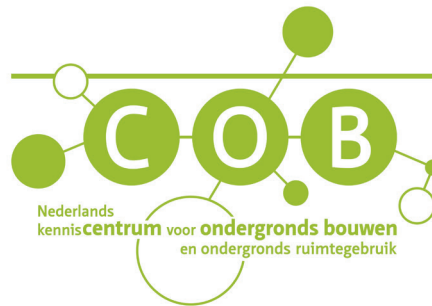
MAIN PARTNERS

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Partners



Become a KIVI member

De Ondergrondse has been working together with the Dutch engineering association “KIVI Geotechniek” for quite some time now. In order to make this cooperation even better, KIVI Geotechniek is offering the students of the Geo-Engineering section the possibility to join the activities hosted by KIVI Geotechniek. These activities include excursions to conferences and more! For most activities you need to be a member of KIVI Geotechniek and most are organized in Dutch language.

6 FREE REGISTRATIONS IN 2018



If you would like to become a member of KIVI Geotechniek, send an email to ondergrondse@tudelft.nl

From the Board

Dear members, staff and other interested,

As the last period of this year is already coming to an end and all the events that took place crossed by like a fast passing train, we still have some beautiful activities on our agenda to look forward to. The board has been in charge now for half a year and unfortunately we have to say bye to Florentine, our fantastic Commissioner of Education. We can also already welcome our new board member: Mitch. He started in February with the master and will take over some functions during the time that some of us won't be in Delft. He is definitely a great addition to the board. Since the last Mol arrived in your mailbox many successful events took place. One of those was the excursion to the Deltaworks, which took place on an ice cold snowy day. During this trip we stopped at the Oosterscheldekering where PhD student Arash explained about his research, from there we continued over the Brouwersdam and the Haringvlietdam to finish the Deltaworks with a tour at the Maeslantkering. To warm up we went ice skating at the end of the day which

was maybe for some of us a 'dangerous' first experience on ice.

At the moment of writing we have busy study weeks ahead of us with a lot of assignments and upcoming exams. Besides studying many of us are already preparing internships, projects, fieldwork or even graduating for next year. The coming events can help in this process with the business course of Witteveen+Bos on the 5th of June followed by the CV check of Sentijn and the company dinner that takes place on the 14th of June.

Of course our last event this year is the amazing GETA trip in the summer to Austria and Switzerland. The committee is finalizing the programme and are also happy to announce that some staff members will join the trip for a couple of days. The released locations and visits promise that the trip will be unforgettable!

Good luck with the exams and I hope to see you all at the end of the year barbecue on the 5th of July!

Jasper Snoeren
On behalf of the board



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Recent Activities

Fugro Company day *March 12th*

The past 12th of March, a group of 1st year students headed to the headquarters of Fugro, in Nootdorp. While the bravest challenged the wind and the rain on their bikes, some of them approached the destination by car. Once everybody was there, a (needed) warm welcome was given by the staff before starting with several presentations. First, a general overview of the activities carried out by Fugro was delivered by Alexandru Grosaru. Then R Emmelt Mastebroek spoke in depth about the research taking place related to the earthquakes in the Groningen region. Then again Alexandru spoke in detail about his job in the maritime department in Fugro.



Afterwards, the group was split in two for a little visit around the installations. While some students stayed in the conference room talking to the hosts about all kind of questions related to the company and their activities, the other group had the chance to see all the kinds of CPT cones available in the company. The cone calibration room was also shown to us, where the cones coming from the different delegations of Fugro all around the world are calibrated.

Once the two groups had the chance to visit the CPT cones calibration room, it was time for the case study. In groups of 4 or 5 students, a site investigation plan was to be designed in order to provide data for the construction of an oil extraction structure in offshore Egypt. Choice of different vessels and equipment was possible, resulting in a great challenge. After



by Carlota

some time for discussion, the different proposals were presented to the group. All of them were very tempting, however only one group could win.

After presentation of the winners, the visit was closed with some drinks and snacks where students had the chance to chat with the hosts. Also, a few pictures were taken to make the moment eternal. It was definitely an exciting visit.

Thanks Fugro!

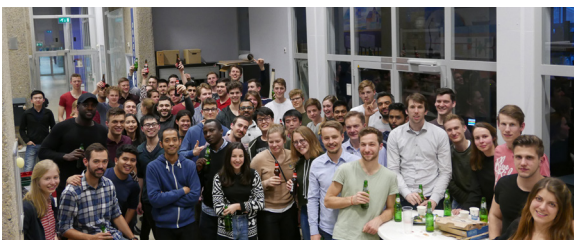


by Konrad

Geo Drink ++ *March 29th*

This year, Eastern holidays were starting at the end of March, with the Geodrink event happening a day before Good Friday. 29th of March was a good day to meet with other students, PhDs and professors at our monthly Geodrink. This one was particularly special because of the upcoming Eastern holidays, and there was the highest participation in this academic year with about 70 people celebrating all together!

For some of us, it was the last occasion to enjoy cold beer and a tasty pizza with our colleagues, before the Q3 finals caught our full attention. For others, it was a perfect start of a short break away from the university. Hopefully, this refreshed everyone's minds before the exams and give the right inspiration to people writing their master thesis. Later, some Geodudes continued relaxing in the centre of the city.





by Hugo

Geodrinks May 3th

After an intense 2 weeks of finals from the 3rd quarter and having started a new quarter on the 23rd of April, our monthly Geodrinks came and allowed us to blow off some much-needed stress and relax.

The night started out pretty mellow, talking about our performance of the 3rd quarter, our expectations of the new one, as well as our plans for the upcoming summer. Soon after, the geo-corner started to get livelier the more students, faculty members and beer crates arrived, which led to increasing the beats on the geo-speaker and showing off some interesting moves. Anecdotes and stories of the past weeks were exchanged throughout the evening and the sound of laughter began to compete with the music. As the evening drew to an end, the party was relocated to the city center, where we continued the night. As always, we all had a great time and lots of laughs, exactly what we needed to recharge ourselves for the new challenges to come.



May 23rd

KIVI lecture afternoon

On Wednesday the 23rd of May the annual KIVI TTOW lecture afternoon was held at our faculty. It focussed on new developments and future projects. There were a lot of incredibly interesting presentations about recent and future bored tunneling projects. Among them was one about a tunnelling project in Egypt, which was a great example of how differently these huge projects are planned and managed in foreign countries. Another lecture focused on the

current state of 10 year old bored tunnels in the betuwe route and how they respond to new structures being built on and around them.

Our very own Rosanne Verloop also gave a presentation about the new initiative: TTOW young members. This organisation will focus on bringing young tunneling professionals together, and getting them in contact with the more experienced generation. The afternoon ended with drinks,

by Floor



where everyone got the chance to discuss the presentations and socialise with each other.



Jakarta

by Linda de Vries

Robust Dutch solutions

After our study we all dream of working on amazing projects at interesting places. Don't worry, you will be sent to exotic places before you know it. That is what happened to me last year, I have lived and worked as a geotechnical engineer in Jakarta for one-and-a-half year and got the opportunity to do some amazing projects in this beautiful country.

Life is crazy as an expat in Indonesia. You feel privileged to live in a luxurious apartment or big villa with swimming pool in one of the fancy business districts in South Jakarta. The gap between rich and poor is extremely big, still everyone has to share the same city. Expensive sky scrapers are built next to slumps, and Jaguars share the streets with shaky bajajs (3-wheeled motorized "taxi's"). Yet there are not so much beggars on the streets, people find a living in almost everything, whether it is selling crackers at the street, or opening the door of the supermarket, the society is built upon this system.

Automation is an unknown concept, and engineering defaults are part of the daily life. They can be found everywhere and are interesting challenges for an engineer. The road for example is jammed daily, there is traffic jam everywhere. As a solution fly-overs are rapidly constructed above existing roads

and new public transport is introduced. It is amazing to see how these construction works intervene with daily traffic. It is impossible to have good logistics in a city of 10 million people with a road network that is handling 400% of its transport capacity. Cars are blocking junctions, motorcycles are squeezing themselves through every tiny space and for pedestrians it is impossible to find a decent sidewalk.

Dewatering of the city is another engineering default in this capital with heavy tropical rainfalls. Floods which occur every two weeks during the rainy seasons, but they are considered a minor discomfort to the people of Jakarta, causing wet feet and more traffic than usual. Most of the floods do not even hit the newspapers. According to Indonesian standards, a flood can be called as such if the water has reached up to your belly, everything below the knees is considered a large puddle.

in a packed Asian city

Twenty years ago scientists have thought that the increasing floods in Jakarta have been caused by climate change. Sea level rise and heavy storms would be the cause of large river discharges and overtopping dikes at the shores and rivers.

Nowadays we know that land subsidence is the main cause of flooding in Jakarta. One of the most extreme settlements in Jakarta occurs near the coast at Pluit, where settlement rates are estimated 7 mm/yr. More than 2 m of settlement has occurred over the past 35 years. The dike along the coast has been reinforced several times. In 2007 and 2009 big floods have occurred which triggered the awareness of land subsidence.

The rapid subsidence of Jakarta has drastically changed the character of the city. Where the city has been protected by river banks in the past we nowadays see big walls of up to 4m and higher. Jakarta has become the biggest bathtub of Indonesia. Where the level of the river lies far above street level and water needs to be actively pumped from the river to the sea. It is hard to imagine when you wander through the narrow streets along the big river wall that there is a river flowing behind it. And to imagine that the level of the river had been several meters lower in the past, so you can easily see the other side of the river from the street.

Although many Jakarta citizens do see that the flood rate is increasing despite the rising



Dike at Pluit, at the coast of Jakarta. People are living more than 2 m below the sea level. This wall has been raised in 2016 after a flood and flooded again in 2017.

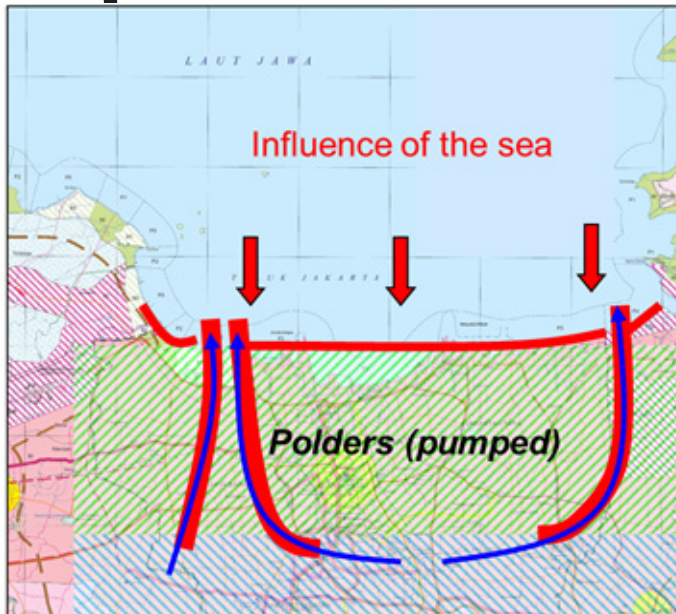
walls, it is difficult for them to understand that this is caused by land subsidence. This ignorance has many reasons, and is directly related to the Indonesian social structure. 36% of the population in Jakarta lives below the poverty line (with a daily income of less than \$3,10 per day), these people are struggling daily to feed their children. You can imagine that flooding is not their biggest problem, and certainly these people are not interested in the cause of the flood.

People in Indonesia also live by the day, dealing with whatever will cross their path. "Go with the flow" is a commonly heard term in Indonesia. This means that the urge of acting against floods is small, and people rather deal with wet feet than taking precautionary measures. Action is reaction. Dikes will be reinforced with sandbags only the moment they fail, and will be replaced by concrete later on.

These incidental repairs are often executed without proper engineering due to the lack of money and time, which means that many retaining walls are under-dimensioned, which frustrates engineers. Often we are getting involved in projects at a very late stage, when there is no point of return. I have for example been assisting in the design of an already failing building pit, where the used sheet piles turned out to be 2m shorter than in the original design because it was cheaper.



Heavy rainfall in front of the Witteveen+Bos office in South Jakarta.



Settlements cause half of Jakarta to sink below sea level. A majority of the rivers is not able to flow under gravity near the coast and water has to be pumped out of the city.

Witteveen+Bos

The main cause of land subsidence in Jakarta is groundwater extraction, which generates a significant drop in the groundwater table.

It is difficult to predict the influence of groundwater extraction and settlements in Jakarta. This is because every building or complex has their own system and there is a lot of illegal groundwater abstraction. Furthermore the Jakarta aquifers are not easily mapped, which makes it difficult to come up with a correct groundwater model of Jakarta. The city is one big delta with an underground build up from fluvial sediments. Lateral and vertical diversity in sediment deposits have been caused by migrating rivers and coast lines, caused by relative movement of the sea level.

This makes it difficult to predict whether aquifers are connected with others. A pump test is a proved method to determine the connectivity of aquifers and the capacity of an aquifer, but is no common practice in Jakarta due to financial and practical issues. Nearby extraction wells (both legal and illegal) will have an influence on the test results. It is also difficult to make a model based on extraction measurements because the source of the extraction is not always well known. A great deal of groundwater is extracted from aquifers with a depth of 200-300 m. Some groundwater wells have determined a clear aquifer and have installed a filter of a few meters in a good sand layers while others have a filter over several of less well defined aquifers consisting of altering sand (silt) and clay layers. It happens that filters become clogged and new wells are drilled. Even so without exact modelling of the aquifers it has been estimated that continuation of groundwater extraction may lead to an increase of settlement of 5 m near the coast in 2080. Therefore, Dutch engineers currently strongly advise the government to immediately stop groundwater extraction.

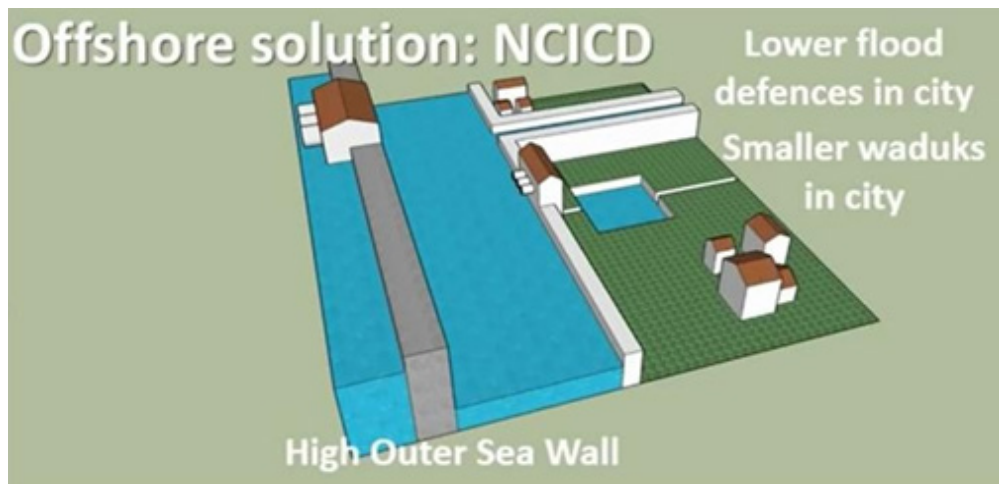
However, this is not happening and Jakarta keeps sinking at a terrifying rate. I have been involved in the NCICD project (National Capital Integrated Coastal



Jakarta dike reinforcement with sandbags and bamboo during the 2009 flood.

Defense) funded partly by the Dutch government to propose a solution for the problem with dewatering of Jakarta. Instead of the offshore solution with an Outer Sea Wall, I have looked at some technical solutions for raising the river dikes onshore, and what the impact will be on the society. This requires a multidisciplinary approach, involving geotechnical engineering, knowledge about the local community, urban mapping and spatial planning, by using GIS and aerial (drone) images. I have simplified the system to a concept that is easy to understand and visualize, explaining how land subsidence causes the river level to raise with respect to ground level, causing the sea to migrate inward. This stops part of the river

is a large outer sea wall, preferably a dike. The area in between the outer sea wall and the main land will be a retention lake where the water will be lower than sea level. The level of the lake will rise during rainy seasons and water will be pumped to the sea by large pumps within the outer sea wall. This concept allows for lower flood defenses within the city and smaller pumps, because water from peak river discharges can flow under gravity towards the retention lake and does not have to be pumped out of the city. This solution has less impact on the communities along the river dikes (because of the lower flood defenses) but can have a bigger impact on the fishing communities and water quality.



to flow under free gravity and raises not only the level of the river, but also moves the flood problem more inland. Raising the dikes and using big pumps is part of the measures which should be taken on land. I have constructed a risk map of Jakarta together with my colleague, in which we indicated the technical measures per area and the impact it has on the society.

There are still many problems to overcome in NCICD. Maybe the biggest challenge is to show the concept to people and to explain why they need this outer sea wall. It may save them from floods by the rivers and it is a more robust solution than a dike that is raised by sand bags every two years.

In NCICD we propose to construct an Outer Sea Wall in front of the coast of Jakarta in addition to measures on land. This outer sea wall will be part of a system to maintain proper dewatering during peak flow and heavy rainfall. The concept

It's 6 AM when I suddenly got rudely awakened. After some fruitless attempts to find the snooze button and at least six but no more than eight mumbled profanities, it was revealed that it's not my alarm, but the neighbor's rooster that was trying to keep me from sleeping. Looking for the nearest useless object, I threw a notepad with lecture notes at it. Who knew that Fortran even makes chickens sleep.

After my morning ritual, it was time to hit the road. The journey was quite comfortable after you got used to the blistering cold and hurricane east winds. Luckily, the entire board was in front of the Civil Engineering faculty at 8:30 exactly, and we could go to our first destination almost immediately. Supported by classic Dutch acts such as BLØF, the Zeeuwse kust seemed to pass by all too quickly. Our first stop was the Watersnoodmuseum. This museum is dedicated to the victims of the North Sea flood of 1953. This disaster took the lives of 1836 people, only counting the Dutch victims. Every section contained personal objects and stories of the people who fell to the cold and dark water. Personally, I felt more connected to the tragedy here than when I read about it in my history books. Not less shocking was the number of garden tools in the museum and how well they were maintained. I would've sworn that I saw a Praxis sticker on one of them.



Once everyone was back in the bus, we continued our journey to the Eastern Scheldt Barrier. Here we faced the cold to receive interesting information from Arash, a man we all respect. We took a group picture and rushed back to the warmth of our vehicle. A little while later we arrived in Hoek van Holland at the Maeslantkering. Most students got here without too many injuries from fighting over the sandwiches (they were worth it). Though I live relatively close to this storm surge barrier, my Civil Engineering heart beats faster whenever I see its beauty. Not in the least because it protects me and my family from the treacherous lover that some



call the ocean. We got a tour through the museum, but our first guide gave up on us after only 5 minutes. Just like any other good museum, they had a spare guide for these kinds of situations. He finished the tour inside with us and then took us outside to the structure. We couldn't have picked a better day for this. Any degree over -13°C wind chill would've been too hot for this endeavor. Having experienced these marvels of Dutch Hydraulic Engineering, it was



time to participate in an activity more Dutch than eating cheese and complaining about the weather: ice skating. We went to the Silverdome in Zoetermeer for this. I believe that at the end of this activity we all had grasped the very basics of it, and I am very proud of my colleagues. To close it all off, we went for All You Can Eat & Drink at the Royal Palace in Delft. I've spent my Saturdays in worse ways!

GETA

Saturday the 7th of July, 20 geo-engineers will depart from Delft for a legendary ten-day trip to Austria and Switzerland, the group will also stay in Germany for a few nights. In Austria and Switzerland we will visit projects related to geo-engineering. It will be fascinating to meet companies that operate in these two countries and to learn how they operate and what kind of challenges they encounter. For example the challenges encountered during operation in hard rock will be different from the challenges geo-engineers encounter here in the Netherlands. Besides project visits this trip will also be about having fun with your fellow geo-engineering students. The organization made sure there will be time for (cultural) activities, hiking, relaxing and maybe some time to drink a beer.

On the first day the group will drive in three minibuses to their first stop: Vienna, Austria. It will probably take them about 14 hours before they arrive at their hostel. Since it was a long ride and everybody probably is still a bit tired from the exams of the previous weeks we expect everyone goes straight to bed and dream about tunnels. This will be of course everyone's own decision. Sunday will be a free day.

On Monday the first project visit is

planned. It is going to be a busy day during which we will visit three projects in and near Vienna. The projects are related to environmental geotechnics and Julia Gebert and a colleague of her from the TU Wien will accompany us that day. The next day we drive to Mittenwald where we stay for two nights. On our way from Vienna to Mittenwald we will visit a construction site. In the evening there might be time to relax a bit while enjoying a small BBQ. The experienced hikers among us can go for a hike on Wednesday while the less experienced hikers should not forget to bring their swimsuit.

Thursday afternoon Anne-Catherine Dieudonné and Ken Gavin join the group for a few days. We are invited to a location of two exciting Swiss companies. They will give a presentation and we will get to see their facilities. We will not say much more about this day but it is going to be a blast! Friday we drive to Zurich. In the morning we will visit a tunnel project site just outside Zurich. Later, in the afternoon we will visit a very interesting institute located in Zurich. They will give a presentation about one of their research projects and we will get a tour through their lab. Friday night we will stay in Zurich where the geo-engineers will most likely take over a random bar in the city centre. At the moment of writing we have not made any plans for the second weekend.



Most likely we will visit the city centre of Zurich, everyone will have some time for themselves and a few group activities are planned.

On Monday the group will visit the project site of a Swiss engineering company. Unfortunately, all good things come to an end, Tuesday, July 17, we depart to Delft. Looking at this program, the GETA committee thinks they have come up with a good mix between project and company visits in various fields of geo-engineering, (cultural) activities, relaxing and fun. We are really looking forward to go on this adventure!

The GETA committee



We wanted to know more about the research that is being done by one of our beloved PHDs, Arash Maghsoudloo. Many of us have seen him working hard in the laboratory and now, explained by himself, we will learn everything about that intriguing sandy slope.

Can you tell us something about yourself? Where are you from? What is your academic background?

Well, I am originally from Iran. I received my BSc from Iran University of Science and Technology in Tehran and I started working as a civil engineer for a while in a road construction project. Then, I moved to Ankara, Turkey, to obtain Master's degree in geotechnical engineering at Middle East Technical University and I worked as a geotechnical engineer in Turkey during and after my Masters. The next step was heading to USA to pursue my PhD studies, where I was working on more or less a similar topic that I am working on here (not exactly the same). After a while, my PhD supervisor resigned from the university due to some personal problems and I had to look for other options. At that point, I came across the available PhD position here at TU delft, I applied and I have fortunately been admitted to TU Delft to join the research team in an interesting project under supervision of Mike (Prof. Hicks) and Amin (Dr. Askarinejad). Therefore, I moved to Delft on December 28, 2015, in the middle of the fireworks of the new year which was a surprising welcome for me and I started my work here from the first week of January 2016.

I am very happy about the adventurous path that I have chosen or forced to choose at some points in my life. I have experienced living in different countries and getting familiar

with totally different cultures than mine, I have found many friends from all around the world, and I have learned a few new languages (I am working on my Dutch now) in this adventure.

What does an average day look like for you?

This is also my question; to understand what I am doing right now (just kidding). I am currently in the most productive year of my PhD (3rd year) and I am extremely busy with my research experiments and analysing the results in addition to publish my findings. As a part of my responsibilities I am also a teaching assistant in some of the geotechnical engineering courses in the Geo Engineering section here at TU Delft. Since there is a very fine line between being a workaholic (overachiever) and wasting your time during the PhD, time management is of course one the most challenging tasks of the PhD student's life. Fortunately, I was able to keep the balance to some extent (to be honest I am still a little bit (really a little bit) on the workaholic side). The key to keep the balance or to stay as close as possible to the line is to work systematically. Enough work, enough sports and other fun activities and finally yet importantly enough drinks (it is never enough!) will automatically fit into a systematic lifestyle. Besides, I am a morning person, I usually wake up around 6:30 to 7:00 AM and quickly check my daily tasks which I think helped me a lot in organising my life.

I have always maintained strong links to my home university, the University of Hamburg, and will now start a new project on sediment organic matter in close collaboration with the former colleagues. As a result of my research networks, such as the CLEAR group (Consortium for Landfill Emissions Abatement Research) or DGE (Dredging in Europe) or the sediment network SedNet, I benefit from strong links to colleagues in Canada, Austria and Denmark, amongst others. These also brought me a scholarship for a research visit to the University of Sherbrooke in Canada, for example.

What is your research about?

We are working in a team consisting of Geotechnical and Hydraulics experts that includes 2 PhD students (one from Geo-engineering and one from the hydraulics sections of TU Delft) and 4 university professors (as advisors and promoters) from TU Delft and a group of experts from the Rijkswaterstaat who are directly involved in the design and maintenance of the Eastern Scheldt flood barrier. My research is related to investigating an ongoing scouring (seabed erosion) process close to the foundation of this structure which is located in Zeeland. The main goal is to understand the possible failure mechanism due to erosion and propose practical solutions to Rijkswaterstaat.

“It is an instrumented computer-controlled inclinable tank”

The erosion is currently far from the main structure because there are strong protection layers for about 600 meters on both sides of the barrier constructed on the seabed. Strong water currents and tidal forces generated by the inlet gates of the barrier are strong enough to cause scouring at the end of the protection layers. Currently, the fluid mechanics experts are investigating the flow field adoptions and their effect on decelerating or preventing the scouring process. We, as soil mechanics experts, are looking into possible soil failure mechanisms in the field and the effect of reinforcements on preventing such failure types. The available in-situ data is limited due to very tough conditions in the field. Therefore, we are trying to somehow simulate a simplified model of the seabed slopes in the laboratory and test them under extreme conditions in a controlled way. The famous Liquefaction Tank in the soil mechanics laboratory here at TU Delft is the device that I am using for my experiments. It is an instrumented computer-controlled inclinable tank which can simulate

the slopes with dynamic geometries and flow type of failures. This device can also be used for many offshore experiments in the future such as simulating the foundation of wind turbines in the sea, stability of the pipelines on the seabed or even simulating the landslide induced Tsunamis.

Which problems did you encounter?

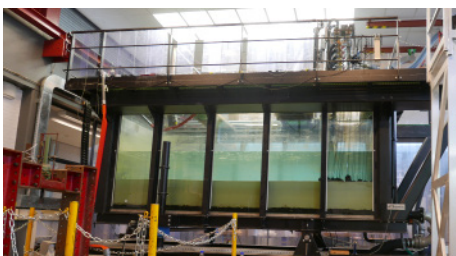
There has been an unexpected issue at the time of the previous PhD student who designed and constructed the tank (Richard de Jager, who is now a geotechnical engineer in Royal Boskalis Westminster). The problem was related to sealing the joints of the glass side walls of the liquefaction tank which took about 1 and a half year to be solved. And fortunately, I have not faced any problems with leaking in the past two years.

What are the results?

We do have very good results indeed. The fact is that, in experimental studies we do not want the results to be as we expect it. So, we perform the experiments and try to interpret the results based on our knowledge and the available literature. My results so far are in a good agreement with the literature and we have produced a new set of results with a better representation of the mechanism in comparison to the available published data in the literature.

What does the future hold?

The results of my research will be very valuable for the Netherlands and will provide practical guides to engineers to ensure the safety and appropriate functioning of the Dutch flood defence system. In addition, this type of phenomenon is very common in most of the offshore and hydraulic structures so the idea and the results can be used anywhere in the world facing the same issues. Currently, I am following the planned timeline of my project and I am determined to finish my research in four years (two more year from now). My long-term plan is to start working in the industry (in a famous company wherever in the world) to gain as much experience as I can in real-life projects and come back to academia one day to teach my experiences to the young engineers.





SPT Operation Plus Boreholes - 20 story building, Barranquilla

The decision to study a bachelor in civil engineering came to me because I had a desire to help in my country in some way and in that moment the civil engineering seemed to be best path for me to follow. I studied at Universidad del Norte which is located in my home city Barranquilla, in the northern part of Colombia. In my first year of studies I also learnt French as a third language because I knew that I wanted to study abroad at some point of my life so I was just getting prepared for it. On top of that I thought it would be an incredible idea to also study electrical engineering, and I did so; this took me two additional years to complete these two bachelors.

Second guest: Andres Santos from Colombia

During my studies I was also teaching assistant for several courses for more than two years, some of those were geometric design of roads, construction management and calculus. In my university we take two courses related to Geotechnical engineering, one is soil mechanics and the other is foundation engineering, both courses were taught by a really tough professor and as in that moment I was not really interested in geotechnics, I sadly failed foundation engineering. I think this, because was actually the only course I failed in my whole career, made me feel the interest in geotechnics since this topic was just different, not exact and full of uncertainties. After taking this course for second

time and passing it, I knew that this path was the one I wanted to follow.

While studying I had the chance to work as a supervisor engineer for the demolition of the old soil laboratory building of my university. This job took around two months and was the first contact I had with the real life all thanks to my structural design professor who owned one of the most prestigious structural design and special structural works firm. Right after that, I had the chance to do an exchange program to Spain for six months and of course travelling all around Europe and getting to know this way of doing things, because at least in my country we follow a different approach to

International

Geo-Corner

design the cities, more vehicle driven than people driven. Coming to Europe also reinforced the desire to study abroad and to learn different ways of doing things; at that moment I knew for certain that I wanted to come here to do master studies.

To get the civil engineering title in Colombia you have to study for 5 years in which you learn most of the topics and areas to develop your engineering skills and be prepared for the real world, so plus the additional two, it took 7 years to get the two bachelors I studied. After seven years of almost just studying I was pretty tired of doing it, so right after graduation in 2016 I started looking for a job in a geotechnical consultant company because I knew that I did not want to wait too long before starting my masters studies so I deeply desired to get a job that could serve also as a preparation for the specialisation for around a year. This was not supposed to be easy because in my city we have only around 6 of those firms and all with all the required staff and full work. Luckily, the tough professor that taught the two geotechnical courses in my bachelor is the owner of two of those firms so I decided to call him and ask if he needed someone... and guess what? One of his firms was requiring a soil laboratory coordinator that could start right away so the opportunity that I was looking for was right in front of me, therefore, I took it, of course.

This firm is one of the oldest, if not the oldest, firms in my

public sector so I widened my horizons because I got to know many areas of the company. Also in some occasions, I was required to go on field to check the soil investigation works and even to program the soil exploration itself, which for me is really interesting.

As you can imagine Colombia and The Netherlands have way different kind of soils and challenges because we have all kind of soils and topographies, we have coast, mountains, wetlands and many other environments that make the geotechnical engineering a real challenge because the whole country cannot specialise in one kind of soil and conditions only. We are also more SPT driven because we have really hard soils and the CPT owners are not willing to risk their cones just to go deeper, but things are changing because new geotechnical issues are being assessed now in a more scientific way. Right now we are finishing building the largest hydroelectric project in our history, which shows that the engineering is becoming more specialized, also projects of wind farms, slope stability works and rebuilding almost all of our roads as well as new river ports and dredging projects are going to be carried out in the following years meaning that there is still a lot of work to do.

Choosing the TU Delft was an easy choice because of its prestige, facilities and professors. I wanted to study in one of the best universities in the world and I think I made the right choice by coming here to pursue the

“Choosing the TU Delft was an easy choice”

city so working there was pretty much like an honor and of course a lot of pressure because most of the projects of my city and surrounding areas contract the soil investigation and design with this firm, therefore I could work in the exploration and design of houses, buildings, schools and even the rebuilding of the city center of Barranquilla which also included some works concerning the river that passes by it. There I had the chance to take a closer look to the laboratory works and soil sample handling in real life, and as I had four pretty experienced laboratory technicians under my charge this was even more challenging. I was the youngest one in the whole office, fact that I looked as a really good opportunity because I could learn from the technicians and other colleagues. In the same office where I was sitting I also had one of the designers of the firm and a person who was in charge of the contracts with the

master degree because I'm learning a whole new way of thinking and assessing engineering problems, knowledge that I would like to apply in my home country to help its development over the years.



SPT Operation Plus Boreholes - 10 meter anchored wall, Barranquilla



Left to right: Alisha, Antonios and Jeroen

Since most of our students are unfamiliar with the working life, RHDHV has given us a sneak peek into the working life of three young professionals in their company. We'll find out what it's like to work at RHDHV and what aspects of it are appealing to them.

What makes your work day a good day?

Alisha: There are 3 things that can make me feel good about my day.

Sometimes it's a good day because I was part of an interesting discussion and learned something new, on other days it's because my input was directly useful to someone else and sometimes it's just because I had a laugh with my colleagues.

Name the top 3 things that make RHDHV appealing to you.

Antonios: Personally, the most remarkable aspect of working in RHDHV is the professional mindset of the company. While it operates on large-scale projects with a demanding application of engineering, RHDHV not only manages to practice top-level expertise, but also fulfills time and cost constraints, as well as meeting high quality standards. Other than that, RHDHV enables me to grow as an engineer. Every day I gain precious professional experience by working in one of the biggest projects in the world, which challenges



Alisha Pengel



Antonios Mavritsakis

and enhances my engineering knowledge. Last but not least, RHDHV offers a friendly atmosphere. My colleagues are welcome and involve me in the team, show interest in my development while also positively helping me overcome my mistakes.

Name the top 3 things that make RHDHV appealing to you.

Jeroen: The most appealing factor of RHDHV is the amount of international and large projects. One of the first projects I worked on was a large land reclamation near the coast of Angola.

Second is the atmosphere at the office, during my master thesis I worked part-time at the office of RHDHV in Amersfoort. The people are very open and eager to help



Jeroen Vork

you out if you are stuck with or are in need of feedback.

Third is the variety in projects the office is currently working on. Deep excavations, offshore wind parks, airport, harbors, land reclamations. RHDHV is specialized in a wide range of projects, which was very appealing to me.

In which ways does RHDHV facilitate personal development?

Alisha: Every starter at RHDHV joins the Young Professional Program (YPP). You're in a group of about 20 people from all over RHDHV NL and over a period of 2 years you go through

the program together. This means 3 intense (fun) training weekends and several one day workshops in between.

Apart from the YPP, Young Royal HaskoningDHV organizes many activities throughout the year (beach volley tournament, site visits, drinks, talks, etc..) in which you encounter colleagues from all parts of the company.

Antonios: I can surely state that RHDHV is a company that invests into its people, especially the starters. There are programs and classes that help shaping an engineering and professional mindset. Also, experienced engineers are willing to support and advise. However, my most enlightening experience comes from my short mission to Mexico. Visiting the site, I realized that my work is now implemented in a real project. While this can be viewed as a burden, as you have to meet quality and time requirements, I believe it is one of the greatest accomplishments an engineer can have when starting his first job.

Describe your most memorable day at RHDHV

Alisha: My most memorable day is probably last year's International Cross Selling Day. It's a yearly event organized by Young Royal HaskoningDHV, in which over a hundred young professionals come together. Last year about 50 were from offices abroad and I had the opportunity to host a colleague from Turkey.

The day was filled with all sorts of activities (speed dating, debate, innovation workshop) and in the evening the main hall of the office was transformed into a dance floor. All of the topics were work/ company related, but it was so much fun, it didn't feel like work at all.

What are you proud of?

Antonios: As working in RHDHV is demanding, I feel proud that I am able to withstand these high-level expectations, fulfill my role and contribute to a great project. Also, I enjoy grasping opportunities to learn and develop as an engineer, which are quite many in this company.

Jeroen: My seniors have the experience of working on complex projects and by working together with them I continue to learn while gaining my own experience. After just two months of working at RH-DHV I was put in control of a project while my colleague was abroad. It was just for one week but it felt nice knowing your colleagues trust your capabilities, even as a starter.

What is the coolest thing you've done for work so far?

Jeroen: I think the coolest thing I've done so far is joining a meeting at van Oord, where all the senior project managers and engineers were discussing the project. The pros are working on real projects with real stakeholders. During studies I've worked on several study projects, but it's way more interesting to do something real.

What are the pros of working life compared to student life?

Alisha: At work I'm pushed out of my comfort zone more often.

Also, interaction with different disciplines makes me feel like I'm part of something broader. I work as a geotechnical engineer, but that doesn't mean that I'm limited to solving only geotechnical problems. Finally, I like the financial independence.

Picture yourself sitting at the office, just looking at your colleagues, what is the first thing that comes to mind?

Jeroen: I'm happy with my colleagues, we have nice mixture of experienced seniors and juniors who just started working. We have a close group and even outside working hours we meet for a game of squash or getting a drink somewhere. I will never forget the day we played lasertag with the office. It was fun seeing your often very serious colleagues going crazy and running around the field.

Knowing what you know now...if you could go back in time and give your "student self" one tip... What would it be?

Alisha: Don't worry about fitting in. You and your colleagues already have similar interests, since you all chose to be geotechnical engineers. But in time you will discover you have even more common ground than you first thought.

Antonios: I would advise my student self to learn how to operate based on a daily task list. In the university I worked without such a guide, which often led me into spending more time than needed to my objectives. However, when meeting time requirements is key for efficiency, I definitely see the need of properly organizing a day's work.



**Royal
HaskoningDHV**
Enhancing Society Together



My 4th column for 'De Mol', already more than a year went by and like I mentioned in my previous column, I graduated. For most students, this means travelling for some time and then start looking for a job. Some people also do it the other way around. Or maybe just taking a well deserved month of relaxing at home and then start looking for a job.

What ever you prefer, one thing is a certainty, you need to find a job!

Finding a job when you are an engineer is not hard, to say it mildly. You really have to try hard to not find a job in The Netherlands, especially for Dutch students. Finding the right job however is a different cup of tea. Probably, you have never thought about where you want to work before, and there are an infinitesimal number of possibilities, for example:

- Different positions: geotechnical, geo-environmental, geohydrological
- Different companies: contractor, engineering firm, research, soil investigation
- Different locations: Netherlands, international cities, on the middle of the North Sea

If you have an endless love for (sheet)piles, like myself, you should become a geotechnical engineer, if you like to save the planet, a geo-environmental positions will probably suit you better. If you like to have a nice office in the middle of a city, with cozy working hours, the engineering firm is probably your best option, if you like to be close to the action, a contractor will fit you better. If you like to see the world while working, an international firm is a good option. If you do not like other people, go work on an oil platform in the middle of the North Sea. I would say there is no good answer but your own answer.

To get to know what you want, you have to get to know companies somehow. A possibility, is to join the business courses, company dinner, lunch lectures or other events organized by 'De Ondergrondse'. This way you get an idea about the projects they do and what your work will look like.

You can also do an internship. In this case you have three months where you can be a part of a project and work in a company together with your potential future colleagues. Or you can even do your M.Sc. thesis in collaboration with a company. I did both and had the opportunity to really experience the company culture, future colleagues (and boss) and an idea about the projects the company is involved in. Maybe you like it, maybe you decide it is a better idea to go to the dark side and become a hydraulic engineer after all, but at least you know.

In my case, the contractor I did my internship decided to fire all engineers, shit happens. Then I went to a different contractor, where I did my thesis, there I liked it even more. I decided to stay. You could also e-mail a lot of companies and have a ton of interviews and go somewhere based on this, however I doubt if you really know what you are up to.

Anyway, you are going to work for a company who is going to pay you a reasonable amount of money to spend the largest part of your day. So you'd better like it!

If I can give you one advise during your M.Sc. studies is to meet companies at events, preferably of 'De Ondergrondse' ofcourse, do internships and your thesis at a company so you know what you are up to. You are working your ass off to become a Geo-Engineer so in my opinion you simply owe that to yourself.

Kind regards, Tom

STOP



Soccer Column

After a rough start of the season, the great Geodudes improved after a change in game plan. A great example was the rematch against "Tamme Eik". As written in the previous mol, the Geodudes had a tough first game against them in March.

On Monday the 7th of May the rematch was scheduled. The Geodudes decided to hire an experienced guy in order to set the tactical game plan. This guy, one Z. Zidane, watched every game of today's opponent. He knew exactly the weaknesses and strengths of the opponent which he translated to an extended game plan. One of the things he mentioned during the

goal the Geodudes got a confidence boost. Left back M. Mustaqim, who was concentrated during the briefing of Z. Zidane, smashed the ball from 40 meters high over the goalkeeper! Such a wondergoal could only be made by our best Indonesian player!

After this promising start, the opponent got better and better. They put a lot of pressure on our defense. This resulted in 3 quick goals in 5 minutes. The Geodudes kept the faith as a real Geodude would do! Captain S. Dicker saw what M. Mustaqim just did, and decided to do the same! After a smooth combination with A. Tziolas he chipped the ball in the net, 3-3. There

"The Geodudes are improving week after week!"

tactical briefing, was the goalkeeper. He comes off his line quite easily. The Geodudes knew that they had to shoot from a long range!

Despite this great tactical review, the team got bad news of two key players. Centre back T. Wegman could not play this evening, while midfielder Pato was still injured. He has got a groin injury during a game of Chile against Argentina. However, real Geodudes are not scared of anything! They believed in themselves and started to fight, although they did not have any substitution! Z. Zidane told to put pressure on the defense of 'tamme eik' right from the start. After 2 minutes this resulted in a goal for the Geodudes! A. Tziolas showed his tikki takka skills with M. Sangers, who placed the ball in the bottom right corner. After this

was still half an hour to play. De "tamme eik" became frustrated because they did not expect the Geodudes to become so strong in just a few months! They put more and more pressure and scored 10 minutes before the end of the game, 3-4. The Geodudes were exhausted, but they knew they had to score just once in order to get a draw! In the final seconds of the game S. Dicker centered to ball to K. Brh who finished easily, 4-4!

This match was just an example of the potential of the Geodudes. These improvements give some confidence for the last few matches of the season and even for next year already!

A real Geodude does always come back stronger after a setback!
#MakeGeoGreatAgain.

Upcoming



JUN

- 5 WITTEVEEN&BOS BUSINESS COURSE
- 6 SENTIUN CV CHECK & INTERVIEW TRAINING
- 14 COMPANY DINNER

JUL

- 5 END OF THE YEAR BBQ (MV)
- 7-17 GEO-TRIP ABROAD (GETA)

AUG

SEP

- 3 FIRST DAY OF THE YEAR
- 13 100 YEARS GEOTECHNICS KIVI

OCT

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