

2018
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Magazine of Dispuut Geo-Engineering "De Ondergrondse"



MAIN PARTNERS



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.

10 FREE REGISTRATIONS IN 2019



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

From the Board

Dear students, staff, alumni and other readers,

I am glad you are reading this, because that means the last Mol of this year has found its way to you. By now the board of the Ondergrondse has changed. The 12th board has made place for the new board that will go by the (un) lucky number 13. In the following article we will introduce each other to you.

We hope to see you during many of the activities we will organize this year.

Steve About Mitch:

Mitch will be our treasurer for the coming year. Or actually most of the year. Mitch already started his master's in February after finishing his bachelor's of civil engineering. So Mitch already got to know the ins and outs of the association. For him Geo Engineering was a logical choice. Born in the highest Dutch mountain range in southern Netherlands, Geo Engineering was already in his blood. For next year, we have a lot of confidence in our treasurer. Mitch is always hardworking and pays attention to the small things, which will be great qualities to have in our board.

Jorrit About Siavash:

As if TA-ing multiple courses wasn't enough, Siavash decided to join De Ondergrondse board as commissioner of education. Much can be said about him, but not that he is a boring guy. After growing up in Iran, he spent time in Malaysia and now in the Netherlands. After completing the master's, he will be heading to Germany for his PhD. One might argue that finding a PhD spot before finishing a master is idiotic, but not for Sia, time ticks on and at the age of 25 no time can be wasted. However, to come back to the present, as commissioner of education, Siavash will do his best to make this year the best year on the TU! If you ever need any help in the master, Siavash is the man to go to!

Coco About Jorrit:

Proudly, I would like to introduce the commissioner of activities to you: Jorrit de Vries! He started his master's in Geo-engineering with a civil engineering background. When I first met Jorrit, he admitted that he is not the type of person to organise activities, but he has changed his mind-set for 'De Ondergrondse'. I could feel his new mind-set when he was happily and passionately promoting the upcoming geodrinks. He is the right person to find the balance between studies and fun activities like the geodrinks and the lunch lectures.

Siavash About Steve:

Steve is the previous president of the Mijnbouwkundige Vereeniging and one of the most well-achieved students of the Applied Earth Sciences bachelor's program in Delft. He is a kind, outspoken, hardworking and focused student with strong principles. I remember when I first met him on the first day of the bachelors and I can confidently say that he has grown out of his shell. His determination and sense of dedication creates a reliable environment for his colleagues and classmates. As the new chairman of 'De Ondergrondse', he will prove his capabilities and build a strong platform for all the members.

Mitch About Coco:

Coco started her master's this year after her bachelor's in civil engineering at the TU Delft. This year she will become the vice chairman of the 'De Ondergrondse' and has to stand in-between the men's testosterone. I am sure that she can handle it and make this study-year a beautiful year. Besides being the vice chairman she will fulfil together with Steve the secretary tasks and is responsible for our great magazine "de Mol". I am sure that it will be a great year with a lot of nice activities.



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Efficient national road monitoring

Fugro will carry out the monitoring of the pavements of national roads in a big part of the Netherlands. Fugro takes the necessary measurements with the internally developed ARAN (Automatic Road Analyzer) and delivers the data to the client Rijkswaterstaat.

The condition of the road surface is one of the most critical components for a safe and comfortable use of the road network. This is why road authorities want to have up-to-date and reliable data on the condition of the road surface. The deterioration in quality of the asphalt must also be monitored over a longer period. Monitoring is therefore only useful if the measurements are of good quality and reproducible. That is why Fugro will measure this condition every year for at least five years with sensors that provide data to detect and record cracks, rutting and roughness at millimeter level.

A big advantage of ARAN is the increased safety, because no road inspectors have to enter more 'the field': all information is available on the PC or tablet for further analysis and follow-up steps. Because the measuring vehicle is traveling with traffic, ARAN is also a very fast way of collecting data

Road profiles and damage levels

The activities include the annual measurement of longitudinal and transverse profiles and texture, and the creation of pavement images. From this data, canting,

8,600 km of asphalt under the microscope

Fast, safe and accurate

ARAN is a measuring system, assembled in a vehicle specially developed and built by Fugro. This automated system consists of a combination of sensors, such as GPS, video, photos and lasers. This provides a very accurate 3D image of the road surface, which is linked via GPS to exact x, y and z values. The resolution is so high that degradation can be determined to the level of hairline cracks. Around the world, 25 Fugro measuring systems are operating, mapping more than 450,000 km of roads each year.

rutting and skidding can also be taken into account. The CROW damage images can be derived from 'track depth', 'longitudinal flatness', 'crack formation' and 'fraying'

Ground Penetrating Radar

Fugro's ARAN measuring vehicles can also collect GPR data (ground penetrating radar) simultaneously with road measurements. With this ground radar literally 'in' the asphalt can be looked at. As a result, the data of the road surface can be supplemented with data about the surfacing structure and the layer thickness. Relationships can also be made between surface damage images and any hidden properties of the underlying layers.

Fugro



Maintenance programs

The collection of quality data on pavement is a first step in the management process. By combining the information with figures on traffic intensity and road loading, a good data set is created from which the degradation of road pavement can be derived. This input helps a road authority to make maintenance programs and schedules more efficient and thereby better monitor management budgets.

Timely insight into the quality of the road surface makes it possible to prevent problems, instead of having to extinguish fires afterwards. That can save a lot of money. ARAN is therefore suitable for all road managers, both in the public and in the private sphere.

More information:

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Multi Disiplinary Project

Since a lot of first year students are probably thinking about what they want to do next year, an internship, additional thesis or MDP we decided to ask some second years who recently finished their MDPs about their experiences. What motivated you to do an MDP? How did you meet your group mates? How was the contact between all the parties? We asked these questions to two of our fellow Geo-Engineering students: Jasper Snoeren and Conrad Bartczak

Where Did You Go, Wlth Which Disiplines And What Was the Subject?

Jasper: We went with four Geo-engineers and two CME students to Guayaquil, Ecuador to look into a risk-based time schedule for the construction of a deepwater port.

Conrad: Our group consisted of Hydraulic Engineers, a Geo Engineer and CME students. The project was focussed on finding an optimal configuration for a network of marinas along the coast of Buenos Aires, Argentina.

Why Did You Want To Do An Mdp?

Jasper: After having good experiences in the bachelor with fieldtrips and studying abroad I was already looking forward to go abroad in the master. Since the first year is full of courses I needed to focus on the second year. I started with thinking about an internship abroad in the first semester, but after hearing many good stories about multidisciplinary projects I decided to go for an experience like that.

Conrad: The first thoughts about the MDP appeared quite early, i.e., the first quarter of the studies. After the successful finals of the first quarter, it was clear that it should be possible to do the MDP in the first quarter of the second year. So why not to hit it? That kind of a project can give you a lot of experience and should develop useful skills.

How Did You Form Your Group?

Conrad: The group-forming process was easy, surprisingly. All of us have gone to the Speed-Mate session in the "Prof" cafeteria in the second quarter, and we quickly found each other to have similar ideas for the MDP, so the group

was formed not even an hour after the session started. Finding a project was a complete black box at the beginning. It was not obvious what to do, but eventually, we found one that fit our specialisations, i.e. HYD, GEO and CME.

How Did You Set up The Project?

Jasper: For a project it is necessary to send many emails to contacts abroad, which is definitely the hardest part. These contacts are from the universities of our international students, from our professors at the TU Delft or you can ask the responsible person for multidisciplinary projects of Civil Engineering if he knows something.

In the email you have to be really clear about what a multidisciplinary project is and what kind of requirements must be taken into account, so the contact person abroad knows if he or she has something you are looking for. In our case we got in contact via one of our fellow international students with a professor from the university in Santiago and via a professor of the TU Delft with a professor of the university in Guayaquil. Sometimes it took more than three weeks to get an answer back, but in the end both professors abroad proposed really nice potential projects.

Conrad: To find a project, at first, we have contacted several part-time and full-time employees of our faculty. Half year before the start, we had two options to choose from and since communication in one went better, we went for this one. One thing that is quite problematic, is indeed the communication between the sides. Often, it is not direct, and sometimes the waiting time for the response can exceed two weeks. It is reasonable to assume that setting the details can take a while.

Comparing two Projects



Were There Any Surprises Along the way?

Jasper: When we all arrived in Guayaquil we already had a meeting the next day with all the people who would be involved the coming eight weeks. During this meeting we also presented our proposal including the research questions and methods. This led to many questions and new insights of what is actually possible to do. The result was that we should come up with a new proposal and scope for the project for next meeting. So the first week was especially consisting of writing a new proposal.

Conrad: A lot of details were only known when we arrived there, so there were some changes to the first thoughts of how it will look like. Going there, we thought that our work place will be at the supervising company, however, it was the local university where we actually ended working at. A lot of surprises were sure to happen in the project and gathering the project information caused some bottlenecks. The data available online was limited in some aspects and we had a several visits around the city to obtain important statistics data.

How Do You Look Back On Your MDP?

Jasper: Practical experience is always recommended for university students and I can confirm that working abroad on a multidisciplinary project will help you to

acquire this. In eight weeks you come across so many new things that you haven't read in the books, which will also force you to come up with new solutions in your team. Not only a project is different, but also the culture difference can be eye-opening, things could work totally different than at home. Besides the project there is also plenty of time during the weekends or evenings to visit the country. We always decided at our weekly meeting on Monday where to get the bus to next weekend. In this way we could spend our time efficiently on the project and still learn new things from the culture in the weekend.

Conrad: The multidisciplinary project was for us a really good experience from which we have learned a lot.. The MDP gives a wide perspective on the project planning, data gathering, analysing what information is more important and how to use that information. As you will be involved in every aspect of the project, it is fun to have a deeper look into project, where you can work in team while being, for example, at the southern hemisphere. You can meet new culture, make new friends and make another part of the world more familiar to you.

Sentijn

Growth starts with great ambition



SENTIJN ACADEMY STARTENDE INGENIEURS

CIVIELE TECHNIEK



> DESIGN & ONTWERP

BIM

CONSTRUCTEUR

ONTWERPER

REVIT

> REALISATIEFASE

WERKVOORBEREIDER

UITVOERDER

PROCES

PROJECTLEIDER

➤ WAT HOUDT DE SENTIJN ACADEMY IN?

Sentijn investeert in innovatieve en ambitieuze ingenieurs die gedurende hun carrière een belangrijke en vernieuwende bijdrage aan de maatschappij willen leveren. Vanuit deze gedachte hebben wij de Sentijn Academy opgericht. De Sentijn Academy staat voor de doelgerichte ontwikkeling van ingenieurs. Om jouw ambities waar te maken investeren we in jou door middel van trainingen en cursussen (t.w.v. € 1.500) en begeleiden we je met een persoonlijk leerplan.



HET SENTIJN ACADEMY TRAJECT

1 KENNISMAKINGSGESPREK

Je bent hoogopgeleid en bijna of onlangs afgestudeerd. Je wil jezelf graag verder ontwikkelen en carrière maken! Jouw traject bij Sentijn begint met een persoonlijke kennismaking bij ons op kantoor waarin we jouw wensen en ambities bespreken. In dit gesprek leggen we het persoonlijke leerplan uit en komen de cursussen aan bod die bijdragen aan jouw ontwikkeling. Zodra al jouw interesses zijn geïnventariseerd bespreken we de bedrijven die daar goed bij aansluiten. Aan het einde van dit gesprek worden de mogelijkheden voor een **vast contract** besproken.

2 INFORMATIE E-MAIL

Na het 1ste gesprek bij Sentijn krijg je een e-mail met een samenvatting van het gesprek en een lijst met bedrijven die aansluiten bij jouw wensen. Ook zal de Sentijn Academy overeenkomst in deze e-mail als bijlage gestuurd worden. Hierna zal Sentijn telefonisch contact met je opnemen.

3 ORIËNTATIEFASE

Nadat je hebt gekozen voor de Sentijn Academy ga je in deze fase gesprekken aan met verschillende toonaangevende bedrijven die wij geselecteerd hebben. Uiteraard bereiden we je goed voor op deze gesprekken middels de Sentijn sollicitatietraining.

4 BESLUITFASE

Nadat je deze gesprekken hebt gevoerd bespreken we samen met jou welk bedrijf het beste aansluit.

5 EEN NIEUWE UITDAGING

Gefeliciteerd, je hebt een nieuwe baan! Als civiel ingenieur kun je aan de slag om jouw ambitie te verwezenlijken. Jouw persoonlijke consultant houdt goed contact met jou om de voortgang van het leerplan bij te houden en indien nodig aan te passen. Ook wordt er elk jaar een Sentijn Academy evenement georganiseerd voor jou en je mede-ingenieurs.

KENNISMAKINGSGESPREK



INFORMATIE E-MAIL



ORIËNTATIEFASE



BESLUITFASE



EEN NIEUWE UITDAGING

NEEM CONTACT MET ONS OP

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As a fresh graduate from SASTRA University, India, I believed that an engineer is a person of technical understanding. However, as I write this article, after 5 years of experience working on site, my perception is completely different. Every engineer has their own perspective of assessing and solving a problem, despite a common technical background. I will take you through few glimpses of my journey and how the whole process brought me to my dream university, the Delft University of Technology.

Like every other Indian Civil Engineering graduate my dream was to work for Larsen and Toubro Constructions, and I was ecstatic when I got that opportunity. However, life at the Railway Construction division of Larsen & Toubro seemed to be too safe and comfortable for my liking, as what I was looking for was an adventurous journey. Coincidentally, I received an offer for the position of Site Engineer in Pay Ah Heng Contractors Pte Ltd, Singapore who were pioneers in micro-tunneling for water works and utility services. I was deputed to manage 2 projects in the Tuas Planning area, which was a reclaimed land in the South Eastern part of Singapore. The contract was to develop the reclaimed land for industrial constructions. The ground improvement was done by vibro-flotation and pipe jacking for laying of sewer lines. Sheet pile walls were used for shafts and was jet grouted to prevent the seepage of water into the pit to avoid the

Fourth guest: Anchal Bhaskar Arun Kumar from India lowering of ground water.

The seeds of Geotechnical Engineering sown by my professor back in my undergraduate studies started to develop: I began to correlate my learning to real time execution. My curiosity would heighten when the Tunnel Boring Machine would approach the reception shaft and I would wait for my foremen and operators to signal: "We are breaking out today" during my regular site rounds.

Both the projects were under direct control of the Managing Director of the company, and regardless of his schedule he always answered my endless questions and taught me various aspects of project execution and management which help me even today. He also helped me recognize the passion that I had for Project Management and advised me on how my technical understanding as an engineer could make me a better project manager in the future. But this journey with him

ended soon, our management decided to close down the company due to losses in other ventures.

The network that I developed during my first year of work in Singapore and the power of LinkedIn placed me in a new role, new company and yes, in yet another new journey. I began working with Rotary Engineering Ltd, the pioneers in Tankage for Oil and Gas Industry having presence in South East and Central Asia. I took over the role of Lead Civil Engineer in a Project by French Oil giant TOTAL for their Lube Oil Blending Plant (LOBP). In this project, we were challenged by time and weather more than the precision of engineering. It was here that I learnt to manage my project budget and to precisely follow the client timeline expectations.

The most exciting experience of my career was at Singapore Lube Park (jointly ventured by Dutch Shell, French TOTAL, Chinese Sinopec) which required a cut and cover tunnel for the utility lines from tank farm crossing a public road to reach the jetty. It was reclaimed land and deep excavation in sand meant that the sheet pile walls should be rightly impermeable. We did follow the observational method to accelerate the work. If rightly worked, reclaimed sand has a predictable behavior. We resorted to the sheet pile wall and impermeable base slab for the mock up phase, and it became clear that Jet Grouting was mandatory. And to further increase the efficiency of excavation, intermittent dewatering system was deployed. It was a mandate to not over pump. The monitoring of ground water was made stringent. The observational method helped us to fine tune the methodology over further phases of tunnel construction.

To focus more on the design understanding, I joined AECOM as a site consultant for a Canal Construction project and a Sewer development project, to be implemented by micro-tunneling. Geo-technical monitoring played a significant role in these urban development projects due to the presence of a railway tunnel, deep sewer systems and expressways flyovers which form the backbone of Singaporean infrastructure systems. The proposed projects were either undercrossing or over crossing the existing utilities and health monitoring of the systems was indispensable. Being a design and project management consultant of the project, I learnt to look at the projects from the clients' eyes.

Throughout my professional career, I developed the understanding of Underground Construction execution and this created an urge to pursue a course in Geo-Engineering and I started looking for avenues to a high-quality Master's Degree. I was fortunate to get an opportunity to opt among NUS, Singapore, TU Delft, The Netherlands and University of Auckland, New Zealand. Such decisions are always difficult to make. The course structure of Geo-Engineering at TU Delft was exactly what I was looking for, i.e. a chance to acquire a deep understanding of Underground constructions with a strong foundation of geotechnical and geological aspects.

One quarter of this academic year is already over. I feel that my choice was right, for I am someone who loves adventures and is open to new experiences. The environment here stimulates me to go beyond my comfort zone, by making reality much more exciting than my own expectations. The weekend project parties and project success celebrations in Singapore are replaced with after assignment parties and quarter survival celebrations. But still, the road trips around Europe are same as in South East Asia: full of fun, excitement and adventures with loads of different types of food. My take from my own experiences is that one should always be ready to face extremes and keep his/her bags always packed for adventures. Life is always going to surprise you, so might as well keep your wings open to fly high! And never forget your parachute while take off, i.e. your friends and family in this country and beyond.



Recent Activities

CPT Congress

June 2018



by Sebastian



On June, 21st and 22nd, the 4th International Symposium on Cone Penetration Test took place at TU Delft. The organising committee, formed by Professors F. Pisanó and M. Hicks from our University and Joek Peuchen from Fugro along with the scientific staff, did a remarkable effort in order to get a great number of technical papers related to this well-known soil exploration method. New technologies applied to CPT's, research by using the equipment and unprecedented CPT-based investigations were presented during these days. Additionally, Professors

K. Gavin, M. Randolph and R. Boulanger gave impeccable keynotes lectures that showed the audience the importance of the CPT in the design of offshore structures, shallow and deep foundation and the management of thin-layered soil. Besides, some companies brought their trucks and equipment to show on site how the procedures are performed. Of course, to improve the contacts and relationships, a fabulous dinner was organised at Museum 'Het Prinsenhof' in Delft together with lunches and breaks where the food and the drinks were always abundant.

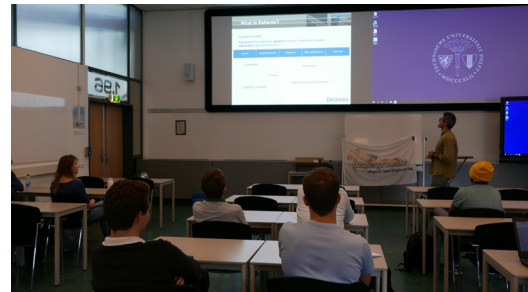


by Johan

Deltares Borrel Lecture

October 16th

On the 16th of October Faraz Sadeghi Tehrani of Deltares gave a nice interactive lecture about Deltares to members of the ondergrondse. His lecture gave a lot of insights in Deltares as a company and into the various fields of research that Deltares is working on. Topics ranged from physical modeling of CPT's in thinly layered soil, to the large scale Eemdijk testing program, where a life sized dike was loaded until failure both with and without reinforcements. After the lecture Faraz and the students went outside for a drink, where the students got the chance to ask all their questions and to discuss the topics from the lecture.



Upcoming



DEC
4 LUNCH EVALUATION
20 GEODrINKS **

JAN
10 NEW YEARS DINNER

FEB
21 GEODrINKS
28 GEO2
BORREL LECTURE

MAR
7 LUNCH EVALUATION
21 GEODrINKS

APR
25 GEODrINKS**

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