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TRANSFORMING THE DANISH LANDSCAPE ONE TOWN AT A TIME

Laerke Kit Sangill, Landscape Architect, VCS Denmark attended the Sustainable Urban Stormwater Management course and was attached to PUB, Singapore's National Water Agency for exchanges on PUB's ABC Waters Programme

PUB: What are your views on the Singapore Water Management Series: Sustainable Urban Stormwater Management (17–21 July 2017) course? Which were the segments you liked best? Which was your least favourite?

L.K.S: I found the diversity of the group of participants from all around the world who attended the course an important part of my learning experience. Learning and knowledge sharing among international participants from various fields of specialization gave rise to added perspectives and clearer connections to key topics. Furthermore, the format of the programme comprising a mixture of lectures by distinguished speakers, discussions and site visits worked very well for me.

My least favourite part was having to adjust to the time difference between Denmark and Singapore, which can be hassle to your system. However, this is hard to change.

PUB: If there was one thing you fondly recall from attending the programme, what would it be and why?

L.K.S: It was very interesting to gain an insight on the incredible development of Singapore into the green, modern city it is today. I enjoyed the sharing of personal views and experiences by Dr Brendan Harley during course discussions.

PUB: What were some of the most valuable takeaways from this programme? How are they relevant / applicable to you in your line of work?

L.K.S: I enjoyed the lecture by Prof David Balmforth, Executive Technical Director from the United Kingdom, on "Advances in Hydroinformatics for Catchment Management". Prof Balmforth was among other things educating us on the advantages and limitations of different software tools and exemplifying these with experiences from projects where Sustainable Urban Drainage Systems (SUDS) is retrofitted into the London city structure.

In VCS Demark we work a lot on how to dimension and retrofit SUDS into our city structure as well. As such, we found the learning outcomes and case studies covered by Prof Balmforth very interesting and useful for us.

Prof David Balmforth, Executive Technical Director, MWH – Stantec, the United Kingdom

PUB: Describe your attachment experience with PUB's Sustainability Office from 24–28 July 2017? What are some of the key highlights from this attachment?

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L.K.S: I had an exciting and educational attachment experience with PUB's Sustainability Office (SO). The officers from SO were welcoming and introduced me to the various tasks and scope which the department oversees.

During the attachment, I learnt about the role and development of SUDS in Singapore as part of the Active, Beautiful and Clean (ABC) Waters programme, and how it benefits the lives of Singaporean citizens. The SUDS developments allow for collaborations across various government agencies and an integrated approach towards city development.

It was interesting to learn that in Singapore, PUB's ability to carry out SUDS projects is closely connected to land utilisation considerations. In contrast, in Denmark which is less densely developed, the key considerations of utilities when developing such projects are the functions of the SUDS elements. Also, building of the SUDS features is the responsibility of the utility while recreational additions are done by the municipalities.

During the attachment, I had the opportunity to visit many different sites where the different project stages were explained in detail. On the first day, I visited the Bishan-Ang Mo Kio park to gain a deeper insight into project planning and implementation.

On the second day, I had the chance to visit the Bukit Timah canal project where ABC Waters features were implemented. I was shown two cleansing biotopes and rain gardens in the catchment areas and learnt about the challenges of implementation due to the close vicinity of homes to the canal.

The focus for the third day was on water design features and promoting adoption. The day started with an introduction to the historic background of the ABC Waters initiative and the role it plays in SUDS in Singapore today. I also visited the ABC Waters feature at Nanyang Technological University's (NTU) Pioneer and Crescent Hall (Ecocampus) and the Jurong Eco-Garden (JEG) which operates on an eco-sustainable approach comprising recreational features and a stormwater management system to collect rainwater for toilet flushing and irrigation purposes.

On the final day, I was introduced to the maintenance aspects of ABC Waters features which covered various maintenance issues (e.g. landownership) and the importance of robust and well-functioning materials. Some project sites visited were Margaret Drive, Alexandra Canal and Pang Sua Pond.

ABC Waters design features such as floating wetlands that improve water quality and enhance the biodiversity of the Pang Sua Pond.

I'm very happy and grateful for PUB to have taken the time and effort to introduce me to various interesting aspects and highlights of their daily work. It was a remarkable and eye-opening experience.

PUB: What are some of the challenges you face in your current portfolio / role, and what are the strategies in place to mitigate or overcome them?

L.K.S: My current challenges are connected to a project called 'Climate Adoption of the Skibhus Area'. The propose of the project is to retrofit SUDS elements into a district called Skibhusk-varteret. The district is located centrally in Denmark in the town Odense where VCS-Denmark offices are located as well.

The 'Climate Adoption of the Skibhus Area' project faced many different challenges during the process. SUDS is still a rather new concept in Denmark and we face many difficulties in trying to introduce hydraulic green elements for handling rainwater on the surface, which traditionally is collected in underground pipelines. The challenges we face are mainly related to project planning, whereby the overall issues are centred around the legislation of planning practices which simply are not geared for projects of this kind.

Completed roadbed projects in Langeline.

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Ongoing roadbed projects in Skibhus area.

PUB: In your view, what are some of the key water challenges Denmark is facing?

L.K.S: Many Danish towns are quite old and the hydraulics of the City is handled in a one-pipe-system, which handles both sewage and rainwater. Many of these pipes do not have sufficient capacity to transport the larger amounts of water produced by more intense rainfall experienced in Denmark these days. The most common consequence of the lack of capacity is the flooding of basements and overflow of sewage water into rivers.

To deal with these issues, SUDS is introduced in many Danish cities as a method to create a more well-functioning hydraulic system. Retrofitting of SUDS elements into existing city structures are, however, challenging. Space is scarce in the city where many functions are already placed quite densely. Creation of local solutions which can be introduced into the city and function in harmony with all the existing functions of the city infrastructure is a big challenge.

In contrast to Singapore, Denmark uses ground-water for our drinking water supply. A popular SUDS solution in Denmark is hence infiltration of rainwater to generate clean drinking water. This works for a large part of Denmark where the soils are sandy and water is able to infiltrate the ground, and where the groundwater table is located low enough not to create flooding issues if more water is added. However, there are a larger number of areas in Denmark where the infiltration solution is not possible. In such cases, delay and transport of rainwater toward the ocean or nearest river system will often be the chosen solution.

PUB: What are your views on the global water landscape?

L.K.S: I find it quite eye-opening to get a deeper insight into issues connected to water and climate change, and how differently it affects countries around the world. This is very a big question and I could easily fill out many pages. For now, I will limit myself to describing Singapore and Denmark as good examples of countries working with green infrastructure for handling rainwater in very different ways. Where Singapore stores water for collection, we infiltrate for maintaining the groundwater resources and to disconnect rainwater from the low capacity one-pipe-system. Where we mostly retrofit the SUDS features into the existing city structure, Singapore introduces it into newly developed city areas.

PUB: What do you think of the future of the global water industry? Is water the new gold?

L.K.S: I don't know if water is the new gold, but it certainly is a valuable element which our survival is crucially dependent on. In addition, I do believe that water is a resource which will be scarce and to a larger degree unequally distributed globally in future.

PUB: Would you recommend this course to future participants? What would you say to them?

L.K.S: I will certainly recommend the course to future participants and my reasons will be the same as described in Q2.

PUB: In your view, what sort of courses/ training would benefit water practitioners in Denmark?

L.K.S: I believe knowledge sharing on projects where SUDS are retrofitted into existing city structures are important learning elements for water practitioners in Denmark.

Kit showing and explaining the roadbed projects in Langelinie to a group of students in Odense.