



EFCA FUTURE LEADER OF THE YEAR 2021

Personal details / Entry Form

Full name: Jordy Vos

Nationality: Dutch

Birthday: 26-07-1990

Age as of 31/03/2021: 31

Company: Witteveen+Bos Consulting Engineers

Location: Singapore, Republic of Singapore (on secondment). Base location: Netherlands

Member Association: Koninklijke NLIingenieurs

Contact details

E-mail address: jordy.vos@witteveenbos.com

Office phone number: +65 6817 2677

Cell phone number +65 8100 8560

Instructions for completing this form



Note to candidates

Each section and sub-section may be expanded as required. The completed entry form should be no longer than **16 pages in total**. Section A is to be completed by your employer, and Section C by the client.

All entries should be submitted in English. Any annexes in other languages should be accompanied by an English translation or will not be taken into account.

The form should be returned to your national association. They will forward it to the EFCA Secretariat.

You will be informed of the results of the competition at end of April 2021.

Good luck!

For those participating in the FIDIC FL competition

The requirements stipulated in the respective EFCA and FIDIC FL competitions coincide largely for 75%. The following three FIDIC competition requirements are entirely covered in the EFCA application:

- Technical achievements (see Section B in this template) (50%)
What is 30% for EFCA
- Leadership achievements (see Section C in this template) (15%)
What is 40% for EFCA
- Social and community contributions (see Section B in this template) (10%)
What is 30% for EFCA

However, EFCA FLs interested in submitting an application for the FIDIC FL competition should complement their EFCA application with the following two extra requirements.

Applicants should demonstrate:

- Contributions to consulting engineering industry (15%)
- Contribution to consulting engineering associations (10%)

Section A. EMPLOYER'S RECOMMENDATION

If one ever wonders what a civil/structural engineer of the future looks like, Jordy Vos is it. Jordy blends engineering knowledge with digital skills and expertise on hardware and software required for the digitalization and automation of the Built Environment. He is a consultant, project manager, scrum master, team leader, construction technology engineer and overall, just a very pleasant and modest person.

Currently, he is in the middle of two large and innovative projects in Singapore, being the "Development of Additive Manufacturing Technology for Construction" and the "Development of an Integrated Building Information System", as part of a "Smart Integrated Construction System". These projects are not only technologically innovative and challenging, but also contain many different collaborators and stakeholders. Jordy manages all well. His leadership skills helped to transfer technologies developed in The Netherlands to the projects in Singapore, while collaborating in different working cultures on a complex range of technology aspects on the field of design, engineering, construction and software. For his assignment in Singapore, he hired and trained a team of engineers by himself and worked closely together with the international offices of Witteveen+Bos. Since traditional project management methods are too inflexible for innovation projects, he adopted agile methods in his project management approach.

His contributions are highly regarded by the ultimate Client (Housing Development Board of Singapore), and direct clients and collaborators (Robin Village Development Pte Ltd), professors from one of Asia's Top-Ranking University (Nanyang Technological University) and his own project team. Jordy excels in communicating in a clear, friendly, and constructive manner. He is structured, takes the management of his projects and its high-quality outcome very seriously. Jordy shows thought leadership through the many seminars and workshops for which he is asked as presenter and through his key advisory role in for example strategic roadmaps for Singapore's construction industry.

The eagerness and ability to learn and absorb everything new, combined with self reflection and modesty, completes Jordy's profile as a true Future Leader.

Name: Jair Smits

Job title: Managing Director

Managerial relationship to candidate: Manager / direct supervisor

Section B. THE PROJECT

B.1 Project description:

IBIS: platform for online management of design and construction processes.

Witteveen+Bos completed the first phase of the development of the "Integrated Building Information System" (IBIS) in Singapore. IBIS is a web-based platform to manage design and construction processes online.

This project was part of a 3-year collaboration to develop a data-driven smart construction system that started in the year 2017. The project is a collaboration between Nanyang Technological University (NTU) and Witteveen+Bos (W+B) and is assigned by the lead agency Housing Development Board (HDB) of Singapore. The overall contract is worth S\$4.7 million.



Figure 1 Signing ceremony of SICS project with Minister Lawrence Wong and members of Housing Development Board and Nanyang University of Technology and Witteveen+Bos (Jordy Vos on left)

The overall project is called "The Smart Integrated Construction System" (SICS). The system harnesses smart technology, through the use of smart sensors and automation, to transform traditional construction work processes and boost productivity. The SICS system comprises three modules: Smart Crane System (SCS), Integrated Building Information System (IBIS) and Smart Tracking System (STS).

- **Integrated Building Information System (IBIS)** – The core of the SICS, this central digital database serves as a collaborative workspace. Using 3-dimensional modelling of HDB projects as a common platform, industry partners in the entire construction supply chain can log in real-time information and progress updates on the project from their dispersed locations. This streamlines information and speeds up data-sharing amongst the different partners, including architects, contractors, pre-casters and construction material suppliers, enabling them to better keep track of budgets and timelines.
- **Smart Tracking System** – Supporting the IBIS, the smart tracking system will virtually manage the logistics of construction inventory as they move from various suppliers to the construction site. Smart sensors with geo-tagging capabilities will be

attached to building components to help contractors manage the flow of construction materials into the work site, and swiftly identify and correct lapses such as wrong deliveries. This will minimise disruptions to the construction process and enable it to progress smoothly.

- **Smart Crane System** – This will automate the manual hoisting process of building components on site. Through smart sensors embedded in the precast components and a network of sensors placed around the construction site, the Smart Crane System will be able to calculate and determine the quickest and safest hoisting path to mitigate potential collisions and swaying, thereby reducing construction time and improving safety.

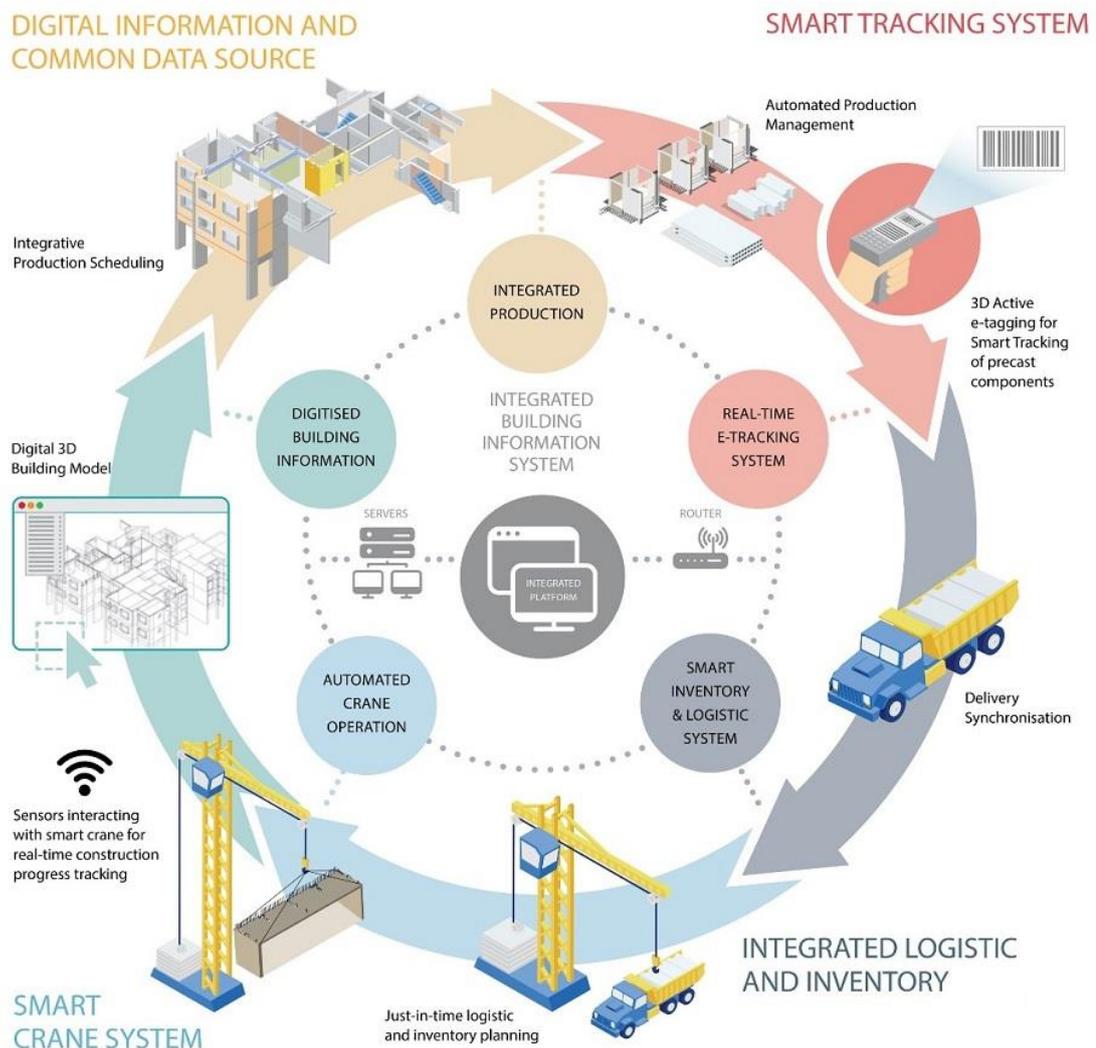


Figure 2 Principle of The Smart Integrated Construction System enables real-time data sharing among industry partners for greater productivity and efficiency (source: HDB)

Witteveen+Bos was responsible for the development of IBIS, the data-driven core of the system. The first phase of IBIS has been completed in 2020. The engineers of the offices of Witteveen+Bos in Singapore and the Netherlands have worked together on the development of IBIS. During the development, they have adopted agile working approaches to seek frequent verification and feedback through visible incremental developments on a regular base.

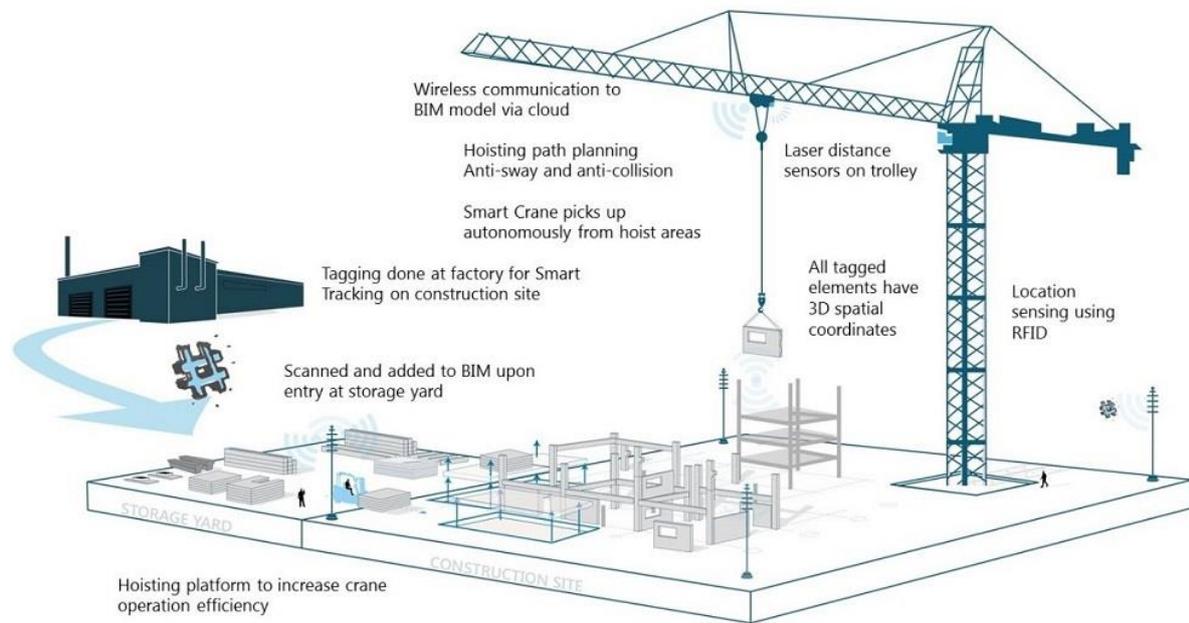


Figure 3 Principle sketch of the overall SICS system

Since most project information is considered confidential, more detailed information can be provided upon request.

For the press release of HDB see: <https://www.hdb.gov.sg/cs/infoweb/about-us/news-and-publications/press-releases/hdb-inks-r-d-collaboration>

B.2 Innovative characteristics of the project:

- The entire construction supply chain can log in real-time information and progress updates on the project from their dispersed locations.
- Fast data-sharing amongst the different partners, including architects, contractors, pre-casters and construction material suppliers
- Virtually manage the logistics of construction inventory as they move from various suppliers to the construction site.
- Help contractors manage the flow of construction materials into the work site via sensor data, and swiftly identify and correct lapses such as wrong deliveries.
- Automate the hoisting process of building components on site.

B.3 The FL's role in, and specific contribution to, the project:

For the IBIS project, Jordy performed a mixed role of project manager, product manager and agile coach. One of his key contributions to this project are his relocation from The Netherlands to the office in Singapore, to hire and train a team of engineers and set up the collaboration with the international offices of Witteveen+Bos for the development of the IBIS platform.

Furthermore, on the job, Jordy learned that traditional project management approaches are not flexible enough to manage these kind of innovative projects and provide little feedback about the benefits for the user, hence, he decided to adopt agile approaches and showed his ability to adopt to complex situations and approaches.

Also, from a technical perspective, Jordy contributed by working closely with the project stakeholders in Singapore and translating their needs into understandable requirements for the development team. With one foot in the construction industry and the other foot in a software development team, he bridged the complex gap between industry needs and technological possibilities within the given boundaries of the project such as time and cost.

B.4 Communication with the client/end user:

As project manager and product manager for IBIS, Jordy worked closely together with all the project stakeholders. As such, for the scope of IBIS he was the first point of contact for the direct and ultimate client (NTU and HDB respectively). On a monthly base, he presented the progress to the clients and evaluated their feedback for further processing in the products. During these meetings, he presented the developed products, discussed the priority of upcoming development tasks and usefulness of new features for the overall industry end users. In the early staged and along the development of the project, several review moments took place to evaluate the developed product with the industry stakeholders such as contractors and precast suppliers.

Important to notice is that Jordy relocated from The Netherlands to Singapore for this project, and successfully adopted to the working culture and working environment of the respective country. He successfully managed to work closely together with his newly created international team in Singapore and work together with developers in Europe and stakeholders in Singapore. With clients and stakeholders from the industry, universities and government he managed the interfaces of the different needs and requirements.

While working on the project, Jordy received positive feedback from his direct clients such as ability to think positive while managing the complex project challenges.

B.5 Describe the project end results and the benefits to the client/end user:

The end result of the project as of today is a working platform with the features as described above.

The key benefits for the client and end user include:

- Streamlining of information and speeding up of data-sharing amongst the different partners, including architects, contractors, pre-casters and construction material suppliers, enabling them to better keep track of budgets and timelines.
- Help contractors manage the flow of construction materials into the work site, and swiftly identify and correct lapses such as wrong deliveries. This will minimise disruptions to the construction process and enable it to progress smoothly.
- Automate the manual hoisting process of building components on site, thereby reducing construction time and improving safety.

Section C. CLIENT'S APPRECIATION OF THE CANDIDATE

Describe your working relationship with the candidate during the project, and evaluate their performance, including their communication skills.



Mr Jordy Vos is one of the collaborators, representing Witteveen+Bos as project manager, for the Smart Integrated Construction System, which was commissioned by the Housing & Development Board (HDB), Singapore in 2017. During the project research and developmental phase, Mr Jordy Vos had demonstrated his professionalism and knowledge of the subject matter well. He was also able to work well as a team player with his other collaborators, to meet the deliverables of the project.

Name and signature _____ Er. Tan Yi Liang _____

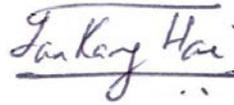
Job title: Deputy Director (Building Design & Precast System)

Company: Housing & Development Board

Section C. CLIENT'S APPRECIATION OF THE CANDIDATE

Describe your working relationship with the candidate during the project, and evaluate their performance, including their communication skills.

Jordy is a proactive individual and is systematic and remains professional throughout the project management. We worked together in a HDB project title "Smart Integrated Construction System" for over 4 years or so. We also work together on a second project title "3D printing of concrete". In both projects, I am deeply impressed by his resourcefulness, diplomacy, and in-depth knowledge of the software. I must say that he has excellent technical training in his undergraduate and master degree programme. Not only is he technically competent, he is able to remain firm and focused (but friendly) in the face of complex situations and could steer the project out of "troubled waters". Clearly, he demonstrates a high level of social skill. Without hesitation, I will rate his performance and his handling of the project as "outstanding".



Tan Kang Hai

Name and signature Kang Hai Tan

Job title: Professor of Structural Engineering

Company: Nanyang Technological University, Singapore



Section D. CV OF THE CANDIDATE



Curriculum Vitae



Personal information

First name(s) / Family name(s)

Jordy Vos

Business Address

Leeuwenbrug 8, 7411 TJ Deventer, the Netherlands

Phone number(s)

+65 6817 2677

Cell: +65 8100 8560

E-mail address

jordy.vos@witteveenbos.com

Nationality

Dutch

Date of birth

26-07-1990

Work experience

2017 - now

Project Manager Development of Additive Manufacturing Technology for Construction for Housing Development Board Singapore

The objective of this project is to develop and explore the possibilities and benefits of 3D concrete printing technology for precast element production to push for higher construction productivity and reduce the dependency on foreign labour. This objective will be reached through the development of a customised 3D Concrete Printing System (3DCPS) at HDB's Centre of Building Research (CBR) and conducting research and development on 3D-concrete printing technologies.

2021 - now

Project Manager Term Contract 3D-scan-to-BIM National Heritage Board Singapore

Services related to the design, creation, production and adaptation of digital assets, including but not limited to 3D modelling, 360 Videography and Photography, Virtual/Augmented/Extended Reality applications. Subjects may include (but not limited to) artefacts, artworks, buildings, places, or reconstructed digital assets, which require the use of the following technologies, techniques and services: Photogrammetry; 360° Photography / Videography; Laser / LIDAR (Light Detection and Ranging) Scanning; Aerial photography and scanning; 3D object modelling; Building Information Modelling (BIM); Rendering.

2021-2021

Consultant Feasibility Study 3DCP Affordable Housing Eastern Africa for United Nations Office on Drugs and Crime

Study to compare innovative and cost-efficient construction methods for social housing in Eastern Africa, with the main objective to investigate if 3D-concrete printing could be a feasible and viable technology compared to other existing methods.

2020 - 2021	Project Manager Web based stakeholder engagement platform for NParks Singapore
	Engagement services to the National Parks Board of Singapore. The goal is to engage stakeholders and the communities to co-create the green spaces in Singapore as part of the citizen parks programme. Witteveen+Bos is delivering a web-based Stakeholder & Citizen Engagement platform as software as a service (SaaS). The Platform provides a visual and transparent way of providing feedback and suggestions on a GIS map. It is based on open maps enriched with a customized reaction module for suggestions and feedback by stakeholders and optionally, displaying different design options on this map. The platform is a proven tool from Witteveen+Bos for stakeholder and citizen participation in urban design projects.
2020 - 2020	Consultant Development of a 3D-concrete printing system for a supplier
	Consultancy and engineering services in a partnership with a system integrator for the delivery of an advanced and large-scale 3D-concrete printing system for a supplier in South-East Asia
2020 - 2020	Consultant Robotics for Built Environment Roadmap for Building Construction Authority
	Roadmap development together with consultancy firm Frost & Sullivan and Prof. David Chau. This roadmap will provide the strategic direction on the type of R&D areas for the second phase of the Built Environment Robotics R&D Programme (2020-2030) of Singapore. The Roadmap will be scoped to change the way we build and maintain buildings by integrating the latest construction methods, facility management methods, and robotics technologies seamlessly. This integration will accelerate the process to enable the industry to break out of current constraints and habits. The Roadmap will also assess the cost implications of various levels of robotic adoption, so that the R&D plans can look at both shorter term adoption feasibility as well as that for longer term.
2017 - 2020	Project Manager / Agile Product Owner Development of online BIM Management platform as part of a Smart Construction System for Housing Development Board Singapore
	Development of an "Integrated Building Information System" (IBIS) as key component for the "Smart Integrated Construction System" (SICS). IBIS is an integrated collaborative platform for the entire project community of a construction project. It integrates BIM-, construction-, contract- and documentation management functionalities.
2016 - 2017	Junior Project Manager LTC fase 3 - Design and Engineering of office building for Dutch Defence Department
	Design and engineering of an office building for the Dutch defence departments. Building consists out of three floors, in total 9,000 m ² surface.
2016 - 2017	Specialist building requirements Feasibility study for Fish Feed Factory Ghana
	De Heus Koudijs Animal Nutrition B.V. was preparing the constructing of a Fish Feed Factory in Ghana. For this project Witteveen+Bos is asked to provide technical and administrative assistance. The project contained a main building with the actual factory and associated facilities as offices and canteen, preferably integrated in de factory building. Within the fenced plot also minor buildings for shop, guard house, weigh bridge and utilities are situated. Roads, parking places and landscaping are also part of the project. Within the infrastructure special attention is needed for the power supply, the water supply, waste(water) and the drainage of the area.

2015 - 2017	<p>Quality controller and Contract manager assistant during construction phase Contract Management construction phase underground car parking 'Jaarbeursplein' Utrecht</p> <p>Project Jaarbeursplein is an underground parking lot in the city centre of Utrecht, one of the biggest cities of The Netherlands. It has interfaces with several building including the central station of Utrecht. Witteveen+Bos made the D&C contract for the client (Municipality of Utrecht), assistance in procurement and after tendering contract management and quality control.</p>
2016 - 2017	<p>3D-concrete printing specialist Development of 3D-concrete printing lab for precast manufacturer</p> <p>Witteveen+Bos was hired in 2017 by precast supplier Dubox (Dubai), to collaborate in the development of a mobile 3D-concrete printing lab. Within this lab, research to printable concepts will be performed. A live demonstration of 3D-concrete printing is being performed at the first Global Manufacturing And Industrialization Summit, held on 27-30 March 2017 in Abu Dhabi.</p>
2016 - 2016	<p>Junior Project Manager Design concept and structural Engineering of 3D-concrete printed drone laboratory</p> <p>Dubai Electricity and Water Authority (DEWA) is setting up a Laboratory for Drones in Dubai. The R&Drone laboratory building had to be constructed using 3D-printing technology. Sub-contractor CyBe delivers the 3D-printed concrete walls for this project and contracted Witteveen+Bos for engineering the final design of the 3D-printed concrete walls.</p>
2016 - 2016	<p>BIM Engineer BIM design of Qatar Goldline metro, underground stations</p> <p>The Doha Metro is a planned rapid transit system in Qatar's capital city that is scheduled to become operational by the end of 2019. It will have four lines, including the goldline, with an approximate overall length of 300 km and 100 stations. It will be an integral component of the larger Qatar Rail network.</p>
2015 - 2016	<p>System Engineer Requirements Specification for Design & Build contract Underground bicycle parking 'De Vijfhoek'</p> <p>The Vijfhoek is an underground bicycle parking in Amsterdam South. The project was part a master plan of Amsterdam which was called 'Zuid-as'.</p>
2011 - 2012	<p>BIM Engineer Design and Engineering of APMT Container Terminal - several buildings</p> <p>For the APMT container terminal in Rotterdam Witteveen+Bos designed and engineered several buildings, including an office location.</p>
2011 - 2012	<p>BIM Engineer Design and Engineering of GVB Diemen - maintenance buildings</p> <p>Design and engineering of several maintenance buildings, for the maintenance of the public transport vehicles (metro's) of the company GVB Diemen.</p>



Education

- 2015 TU/e - Eindhoven University of Technology, Master of Science (MSc) - Architecture, Building and Planning Building
- 2012 HAN University of Applied Science, Bachelor (BSc) - Architecture & Construction Engineering,

Training and certificates

- 2020 Project Management Institute, Agile Certified Project Manager
- 2020 Certified Professional Autodesk Revit Architecture
- 2020 Coursera Modern Product Management Fundamentals
- 2018 Witteveen+Bos, International Contract Management
- 2018 Witteveen+Bos, Technical Writing
- 2017 Singapore Water Association, The Negotiation, Administration & Management of Construction Contracts, focussing on the Public Sector Standard Conditions of Contracts (PSSCOC)
- 2016 Witteveen+Bos, Consultancy, Communication and Project work
- 2016 Witteveen+Bos, Project Management
- 2010 SSVV Netherlands, Safety for Operational Supervisors SSC (SOS-SCC)

Personal skills and competences

Mother tongue(s) **Dutch**

Other language(s) **English**

Self-assessment
European level (*)

Language
Language

Understanding		Speaking		Writing	
Listening	Reading	Spoken interaction	Spoken production		
Dutch	Dutch	Dutch	Dutch	Dutch	
English	English	English	English	English	

Social skills and competences

Empathy- Interacting with people from different backgrounds and working levels, able to create a strong bond on all levels and cultures and relate to their feelings.

Cooperation - Leading an international team of engineers, working together with international stakeholders (internal and external) from different backgrounds such as government, industry and universities and different levels such as engineering up to high management levels.

Verbal and Written Communication - Communicating complex projects with different aspects such as design, engineering, construction and software in such a way that everyone understands it. Weekly progress meetings for several projects, to explain the progress made in projects to higher management (internal and external). Daily meetings with team to discuss the work completed, upcoming work and reflect on the working method and results.

Listening - Able to understand complex issues and challenges, both technically and contractually. Translating complex needs and preferences from stakeholders and clients into understandable requirements, tasks and actions.

Organisational skills and competences

Waterfall Project Management (Traditional) - Management of traditional design and construction contracts. Fulfilled roles as project manager and assistant of contract managers.

Agile Project Management - Management of highly innovative projects that require frequent verification of development outcome and frequent adjustment of working approaches, priorities and tasks.

Technical skills and competences	<p>Civil Engineering - Study background in Building Construction Technology. Passion for inventing better ways to do things.</p> <p>Innovation - Curiosity to find solutions for complex problems and think out of the box. Highly motivated to bring technologies like Additive Manufacturing to the construction industry.</p> <p>Software Development - Fulfilling roles and product manager in the development of highly innovation software solutions in the Built Environment</p>
Computer skills and competences	<p>Communication software - Teams, Zoom, Webex, Slack</p> <p>Project Management Software - Microsoft Project, Jira</p> <p>Engineering Software - Autodesk Architecture, Engineering and Construction Suite, several other applications</p>
Other skills and competences	<p>Leadership - Leading a team of highly motivated engineers, but also working closely together with engineers and research from other offices and organisations. As such, the projects I work on are mostly collaborations of multiple teams and competences where I am connecting the dots. Furthermore, taking the lead in the development and implementation of several digital technologies and often speak on events to share my vision, thoughts and observations.</p> <p>Conflict Resolution - Innovation, especially in the construction industry, always brings up challenges and conflicts to solve. That is why it is innovation - unpaved ways need to be explored and crossed challenges need to be solved. While working on this, I often take the responsibility to coordinate conflict resolutions.</p> <p>While working constantly on new ways to do existing things differently, Problem Solving, Creativity, Analytical Thinking are important competences for me to possess. By analysing the root cause of the challenges faced, I come up with creative solutions in projects related to engineering, construction, additive manufacturing and software development.</p>
Hobbies and activities	<p>3D-printing of objects for in and around the house</p> <p>Exploring new places by all modes of transportation</p> <p>Working out to stay fit and healthy.</p> <p>Spending time with friends and family, when COVID allows</p>
Papers published	Not applicable
Public speaking experience	<p>Speaker - Centre of Management Technology, Singapore, Ready-Mix Concrete, Sustainability and Construction Practices</p> <p>Speaker - ASTM International Conference on Additive Manufacturing 2020</p> <p>Lecturer - BCA Productivity Specialist Diploma</p> <p>Speaker - Panel Discussion SUTD DManD Symposium, 2020</p> <p>Speaker - Start up & Initiatives Expo by NAMIC, 2019</p> <p>Speaker - Trade Mission Dutch Embassy, Kuala Lumpur, 2018</p> <p>Speaker - Institution of Engineers, Singapore, 2018</p> <p>Speaker - Singapore International Robo Expo, Singapore, 2017</p>
Membership of professional organisations	Not applicable