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FIDIC Future leaders.. leading the way

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Engineering a post-Covid future: the challenges for global infrastructure

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Prinaven Gounden is a Professionally Registered Civil Engineer with the Engineering Council of South Africa and a Member of The South African Institution of Civil Engineering. As a Senior Engineer at Knight Piésold Consulting, he has been involved in the design and construction supervision of several national, provincial, and municipal road related projects. He completed a BSc Engineering (Civil) at the University of Witwatersrand and has also trained at the Indian Academy of Highway Engineers in India.

Prinaven is an active member in the Consulting Engineers South Africa Young Professionals Forum (CESA YPF) and encourages young professionals to become more active using platforms such as the CESA YPF in order to share experiences and work together towards overcoming challenges within the industry.

Neelam Parbhoo, South Africa



Neelam Parbhoo is a Civil Engineer at Knight Piésold with 3 years of work experience, primarily in the infrastructure and mining sectors. She currently specialises in Structural Engineering mainly in the field of Bridge and Culvert design. She graduated with a BSc in Civil Engineering from the University of the Witwatersrand in 2016 and a Master of Engineering in 2019.

She is actively involved with Consulting Engineers South Africa (CESA) where she serves as Chairperson of the Technology and Innovation Committee as well as Vice Chairperson of the Gauteng South Young Professional Forum (YPF).

The emergence of the Covid-19 pandemic has pushed many industries to revisit the way in which they conduct business. This has led to companies, including those in the consulting engineering sector, to consider new technologies with the aim of adapting and innovating to remain relevant in the current climate whilst also ensuring minimal disruption in the project cycle.

Drone Technology has been identified as one such technology which has gained popularity in recent years. The use of Drone Technology as a tool for the development of infrastructure is wide reaching and can be applied to several parts of the project cycle. These are further discussed below.

Drones for Aerial and Infrastructure Survey

The focus on social distancing and restrictions in travel have meant that drone surveys prove to be useful. A drone survey refers to the use of a drone, or Unmanned Aerial Vehicle (UAV), to capture aerial data.^x This data and subsequent software can be used to create a range of outputs including elevation and 3D models of the project areas as well as existing infrastructure.

In some countries legislation allows for lower altitude flight with the use of drones, compared to other aerial methods, allowing for more detailed surveys. This enables the user to extract information such as highly accurate distances or volumetric measurements to meet their needs.

The use of drones for survey is generally faster, requires less manpower and allows for survey in remote and dangerous areas, which are deemed costly and high risk when considering traditional land

surveying methods. It also allows engineers to inspect infrastructure, such as cooling towers and reservoirs in a safer manner.

When considering infrastructure surveys, thermal imaging allows designers a chance to gain a clear picture of existing infrastructure conditions, including insight on existing reinforcement in structures identifying issues such as, identifying leaks in water systems. Information obtained through such methods allows for data to be easily exported to BIM applications for further modelling.^{xii}

Drones for site supervision

The use of drones on construction sites to assist with supervision has the potential to increase efficiency of monitoring and data collection as construction progresses. Inspections can be undertaken more frequently, and a greater amount of area can be assessed efficiently.² The use of drones provides the project team the ability to obtain aerial images of the site without physically having to travel to site to determine whether elements are constructed in accordance with design specifications.²

Drones can create real-time aerial images from sites which can be shared with site personnel and team members based at offices; project teams can meet virtually to deliberate project programming, resource requirements and potential challenges.²

Since drones can access hazardous locations of a construction site, project teams can also take advantage of this to identify and address technical problems in locations where it might be risky to do so in person. Additionally, drones equipped with surveillance instruments can improve safety inspections due to the fast access to images as well as real time metrics from a range of locations around the jobsite.^{xii}

Drone technologies allow consulting engineers to perform efficient services for the development of infrastructure in the new normal. The capability of drones to deliver topographic mapping, surveying, remote monitoring, and progress reporting can prove to be an invaluable tool throughout the life cycle of a construction project.²

They can efficiently collect data of a high standard with relative ease and enables teams to interact remotely.² By utilizing the advantages of drone technology project teams can save time, costs and reduce risk while working under regulations set in the new normal. Drones are a significant technological advancement that can be utilised as an asset in the consulting engineering industry far beyond the challenges of delivering infrastructure in the current socio-economic conditions.