Gathering21

Construction Innovations
for Future Generations

CitA

WELCOME

to virtually, the most important conference in Irish Construction this year

5th CitA BIM Gathering Virtual Conference

21 - 23 September 2021

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Drones in Construction

William Adams

Dr. Tara Brooks

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Tara Brooks

KTP:

"To engage new software technologies and processes on site to facilitate the implementation of BIM models in the open field environment."

FELIX O'HARE & CO LTD

QUEEN'S UNIVERSITY BELFAST

Funding:

UKRI Innovate UK

t.brooks@qub.ac.uk

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Introduction

Felix O’Hare & Co Ltd

- Based in Newry, Co. Down.
- Services include Pre-Construction, Construction, Design & Build, Fitout, and Maintenance.
- Projects including Education, Healthcare, Leisure, Industrial, Transport, and Conservation works.

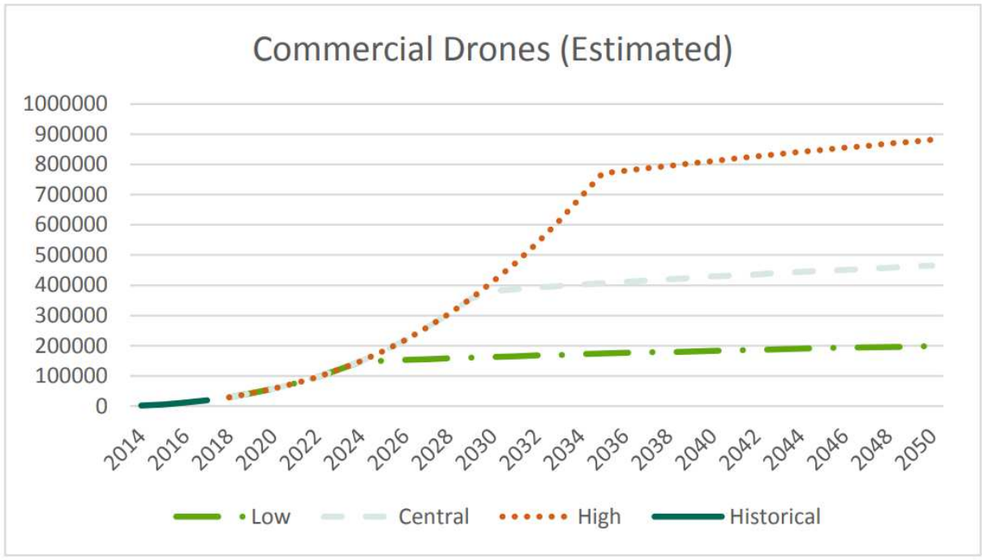
Myself

- MSc Project Management & BIM & just over 2 years drone flying with Felix O’Hare & Co Ltd.

Adoption of Drones

Drone Market Trends

- Barclays - 2018 = €3.6 billion
  2023 = €36 billion
  Cost Savings = €85 billion

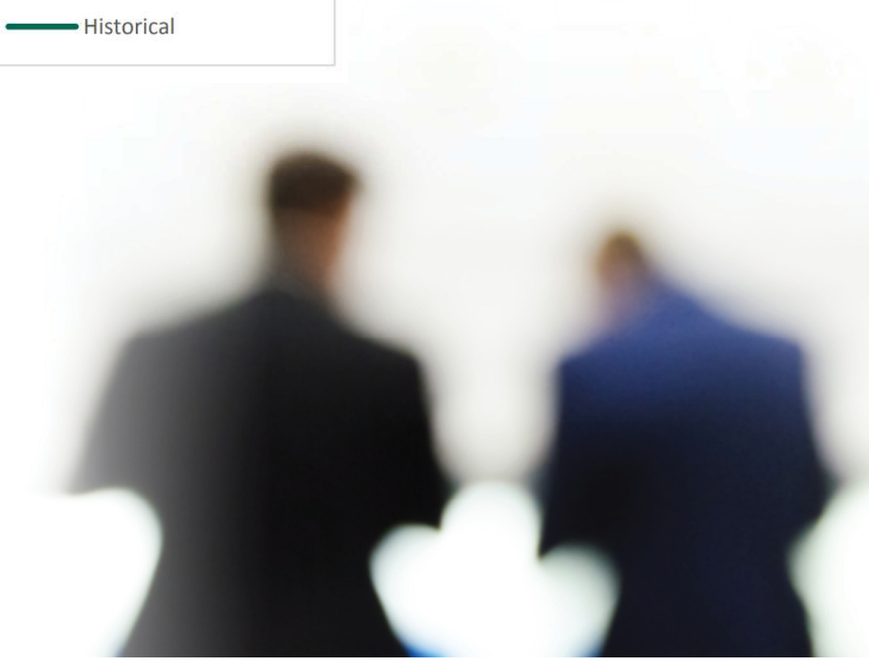


(Department for Transport, 2018)

Table 2: Estimated number of drones in UK skies in 2030, by sector

Sector	Estimated number of drones in 2030
UK wide	**76,233**
Public and Defence, Health, Education and other services	27,521
Agriculture, Mining, Gas and Electricity	25,732
Transport and Logistics	11,008
Construction and Manufacturing	4,816
Technology, Media and Telecommunications	4,541
Financial, Insurance, Professional and Administrative Services	2,514

(PWC, 2018)



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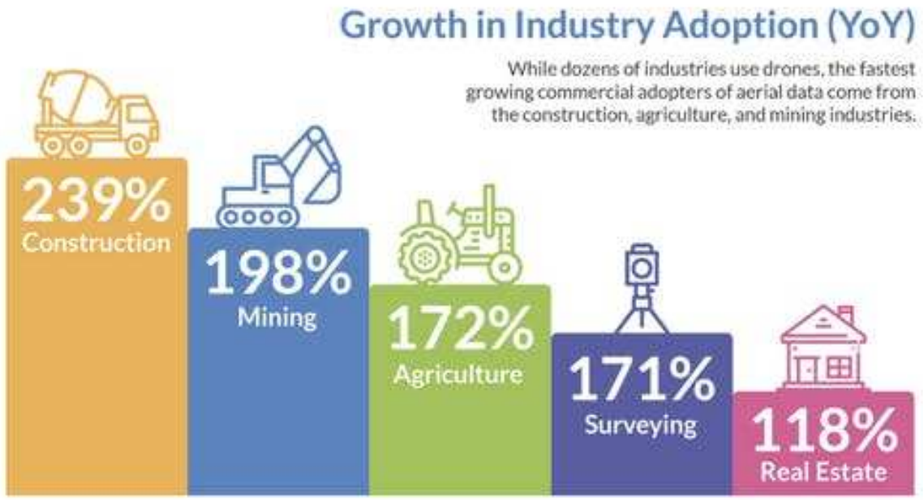
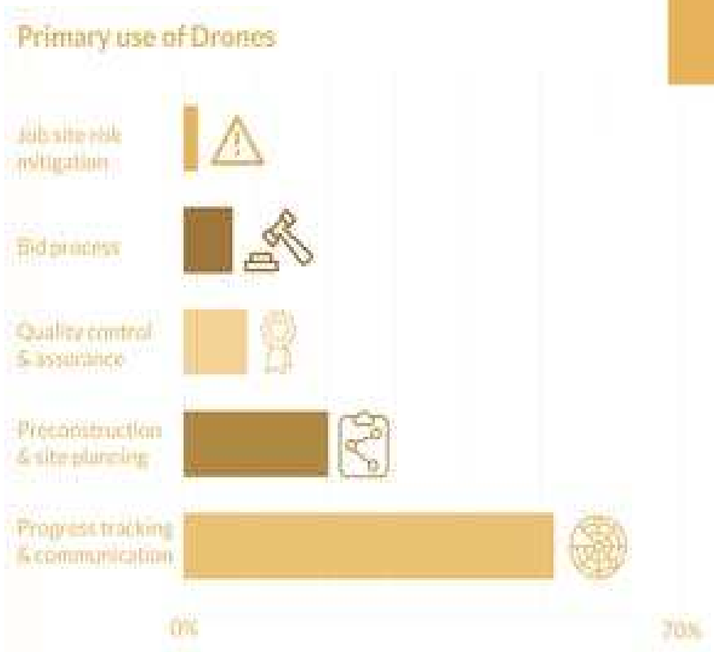
Adoption of Drones

Construction Industry Adoption

- NBS - Annual growth of 58%.



(Dronedeploy, 2018)



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Types of Drones in Construction

Multi-Rotor Drones

- Precision flying.
- Can accommodate a higher pay load.
- 20-35 min Flight time.

Fixed Wing Drones

- Greater stability in higher winds.
- Better Flight time – up to 5km^2 in 90minutes.
- Cannot remain stationary.

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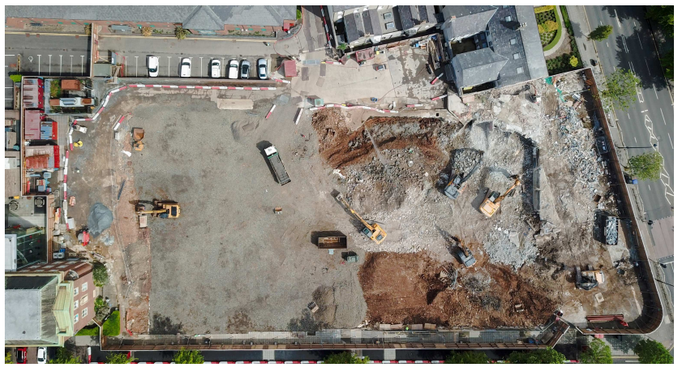
Benefits of Drones in Construction

Progress Monitoring



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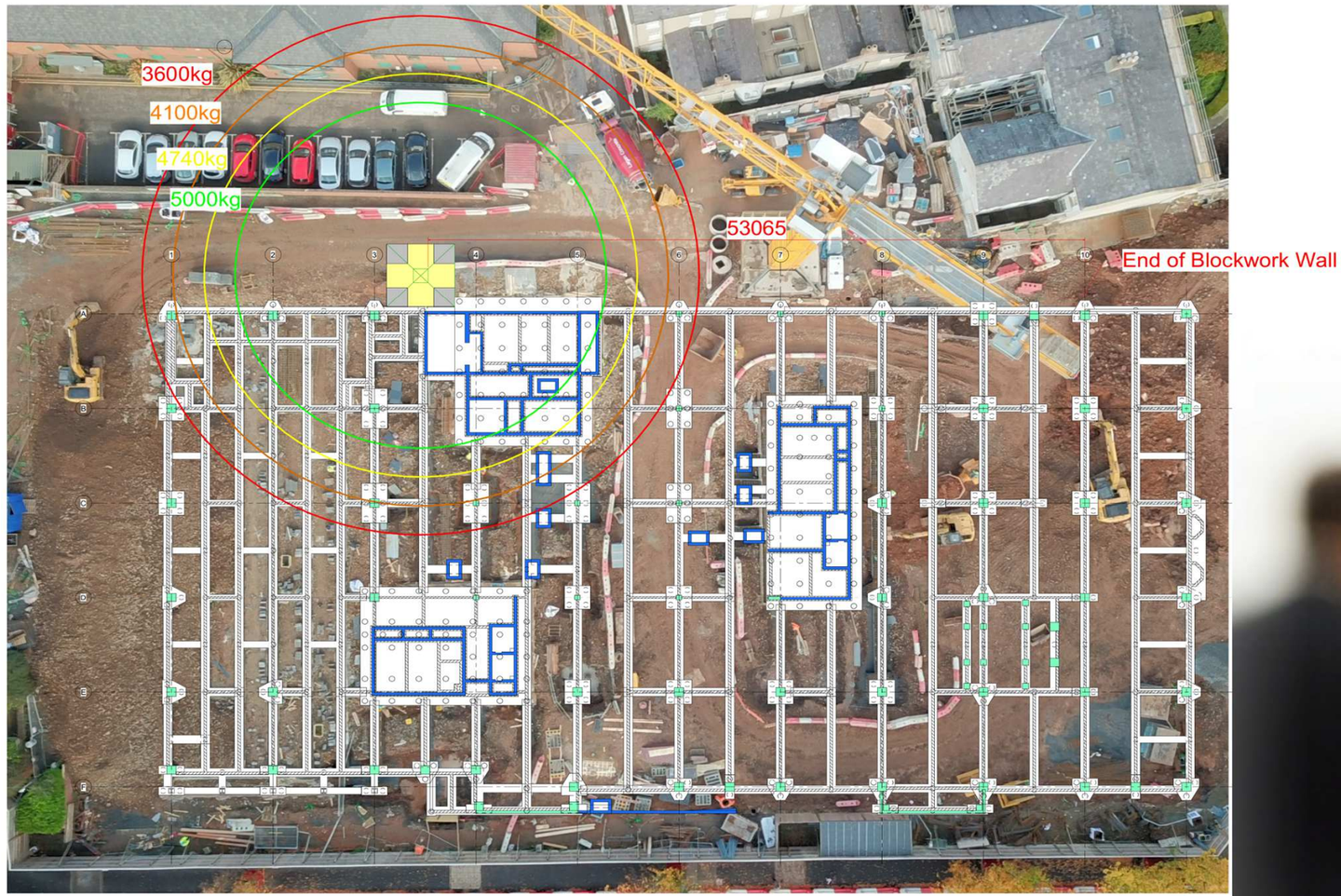
Benefits of Drones in Construction

Logistics Planning

Health, Safety & Security.



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Benefits of Drones in Construction

Health, Safety & Security.

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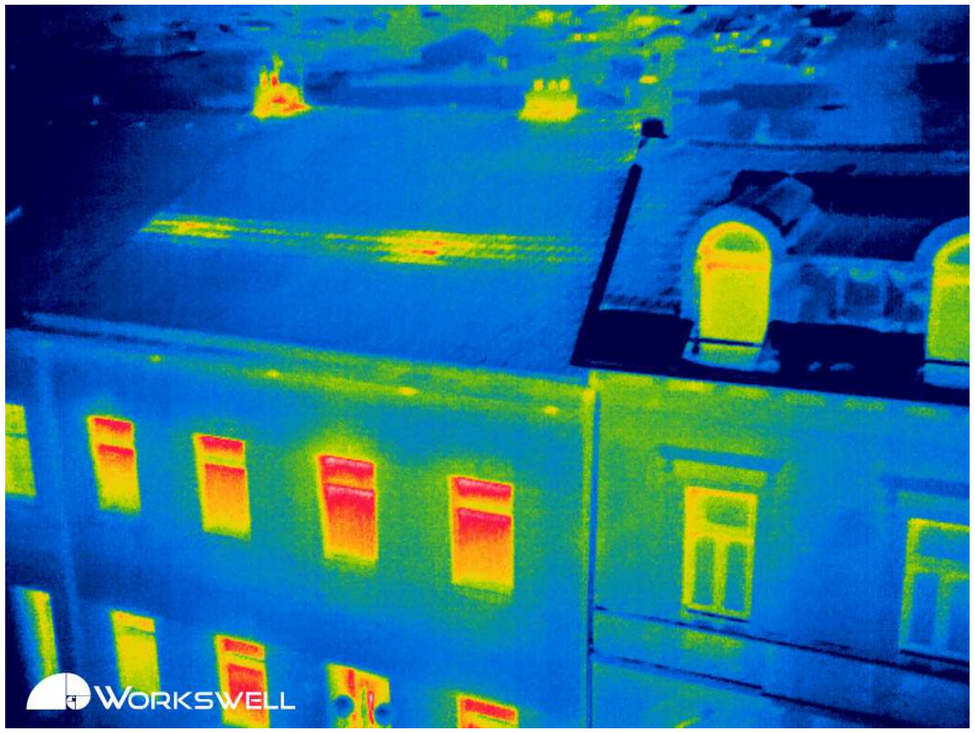
Benefits of Drones in Construction

QA & QC

- Thermal imaging



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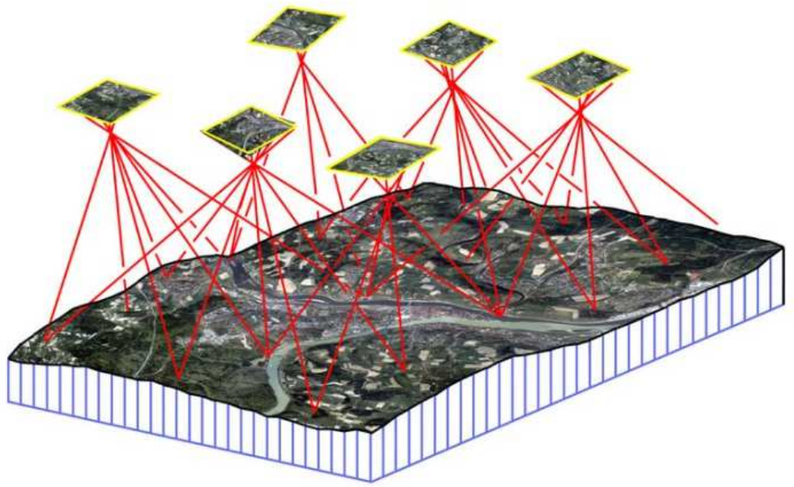
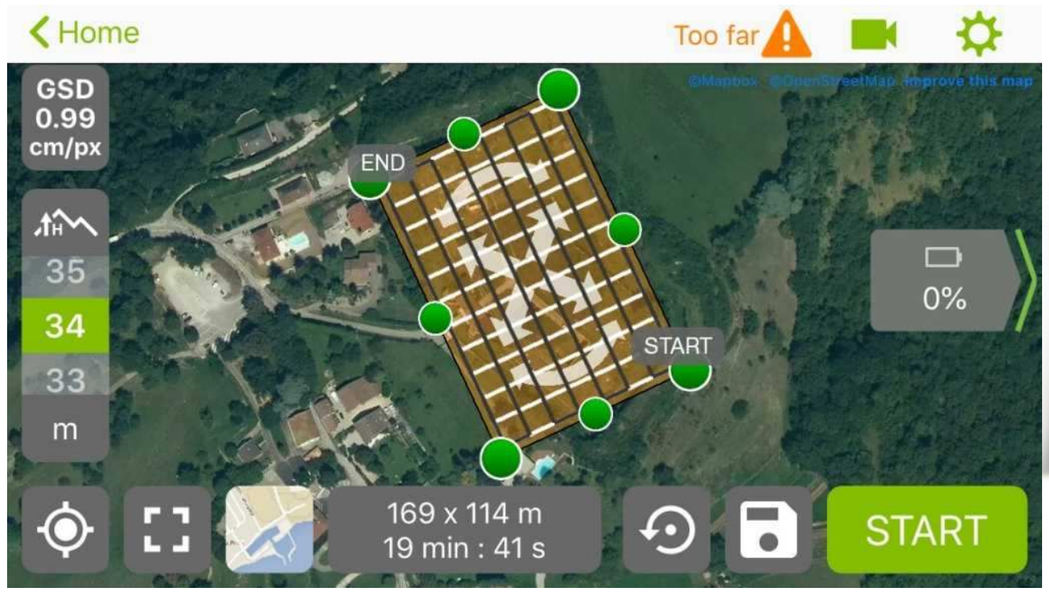
Benefits of Drones in Construction



Photogrammetry

- Automated flight of overlapping images to be stitched together and create tie points.

- DroneDeploy, Pix4D, Litchi.



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Benefits of Drones in Construction

Photogrammetry

- Providers within the Construction Industry

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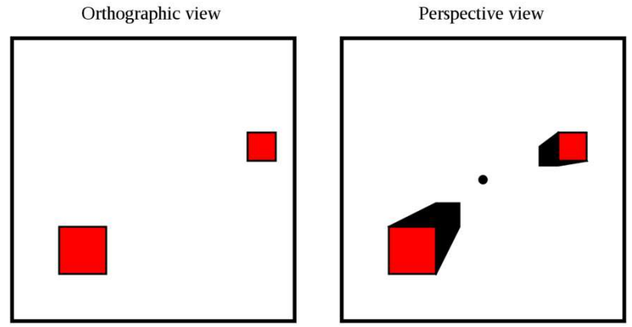
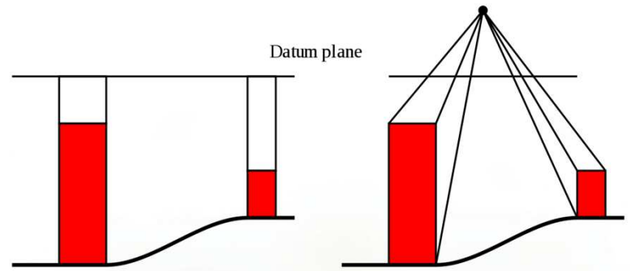
Benefits of Drones in Construction

Photogrammetry

- Orthorectified Images





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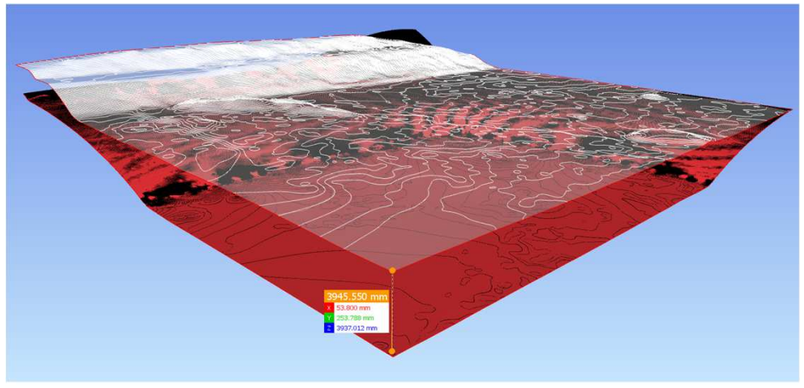
Benefits of Drones in Construction

Photogrammetry

- Reporting
- Topographical Surveys



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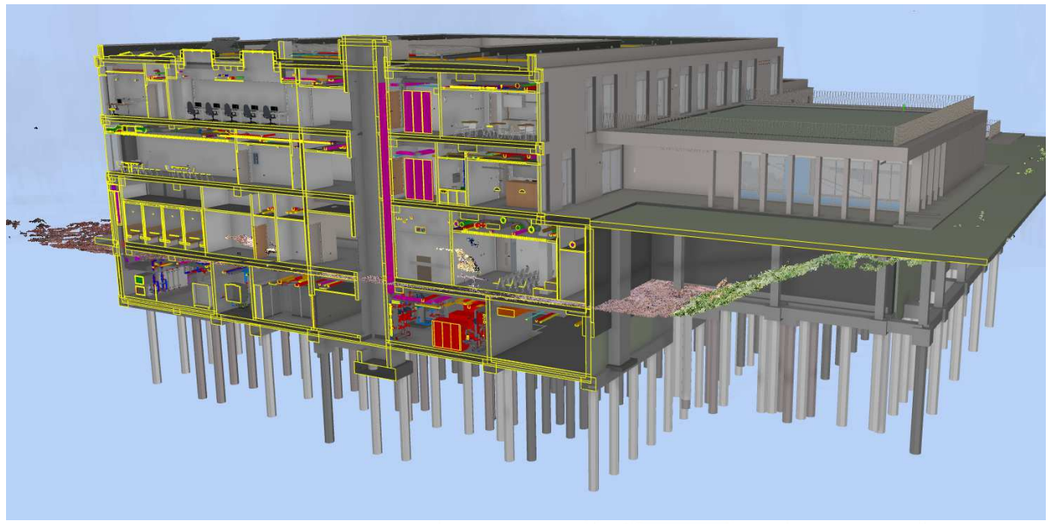
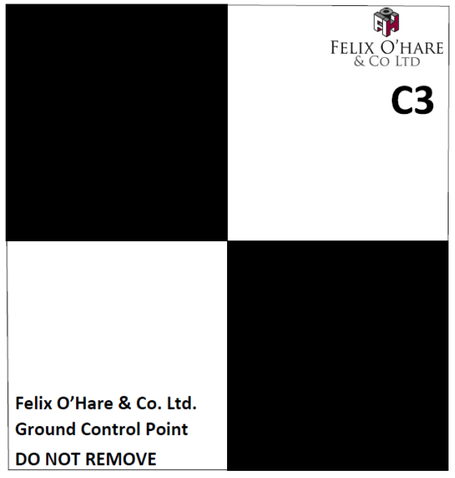
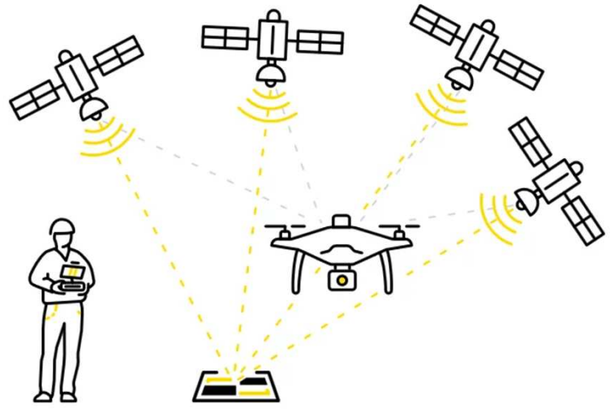
Benefits of Drones in Construction

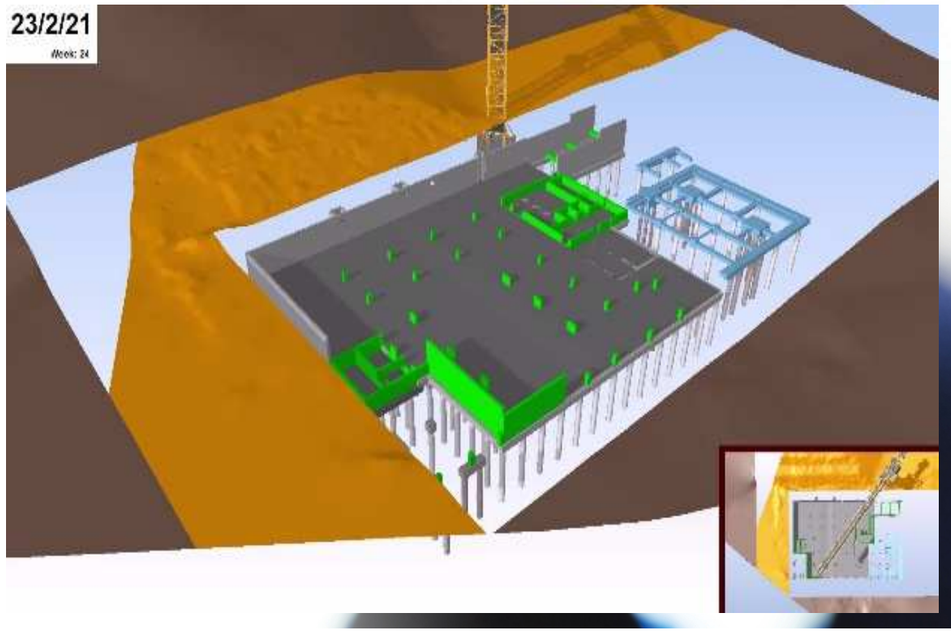


Photogrammetry

- Topographical Surveys







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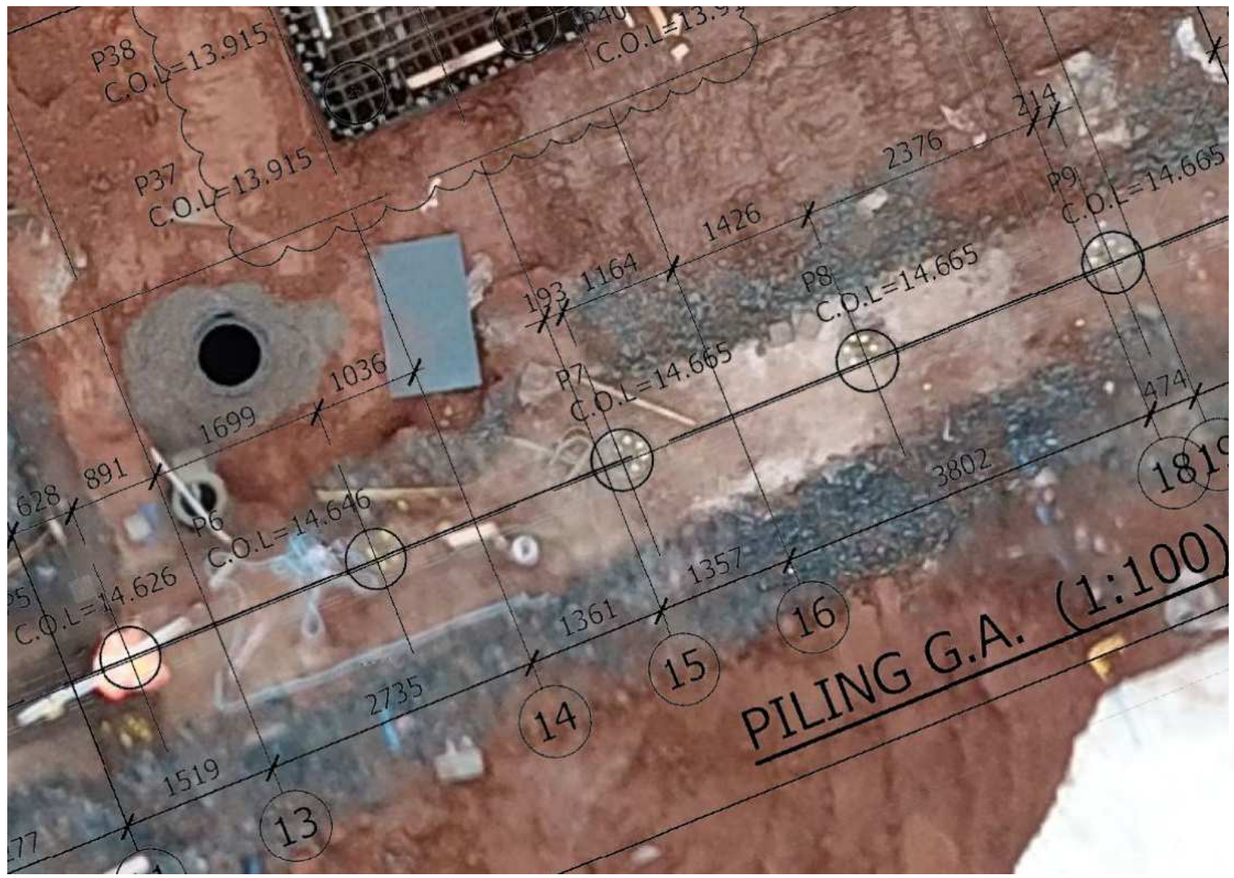
Benefits of Drones in Construction

Photogrammetry

- Validation



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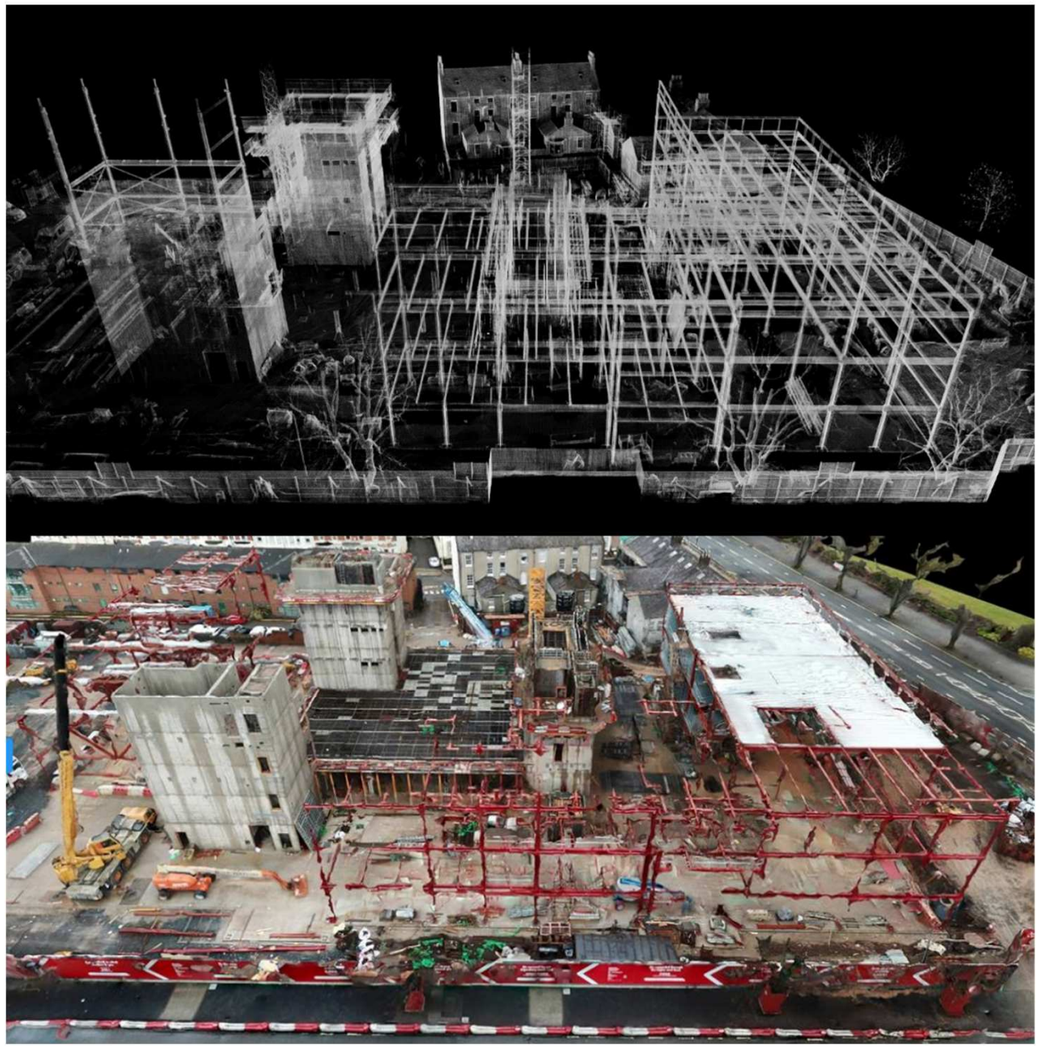

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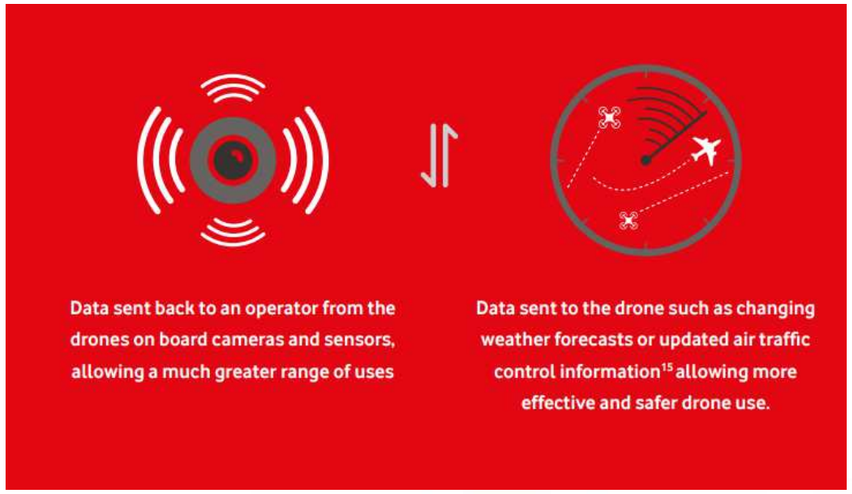
Future of Drones in Construction

The Connected Job Site

- 5G Connected Drones



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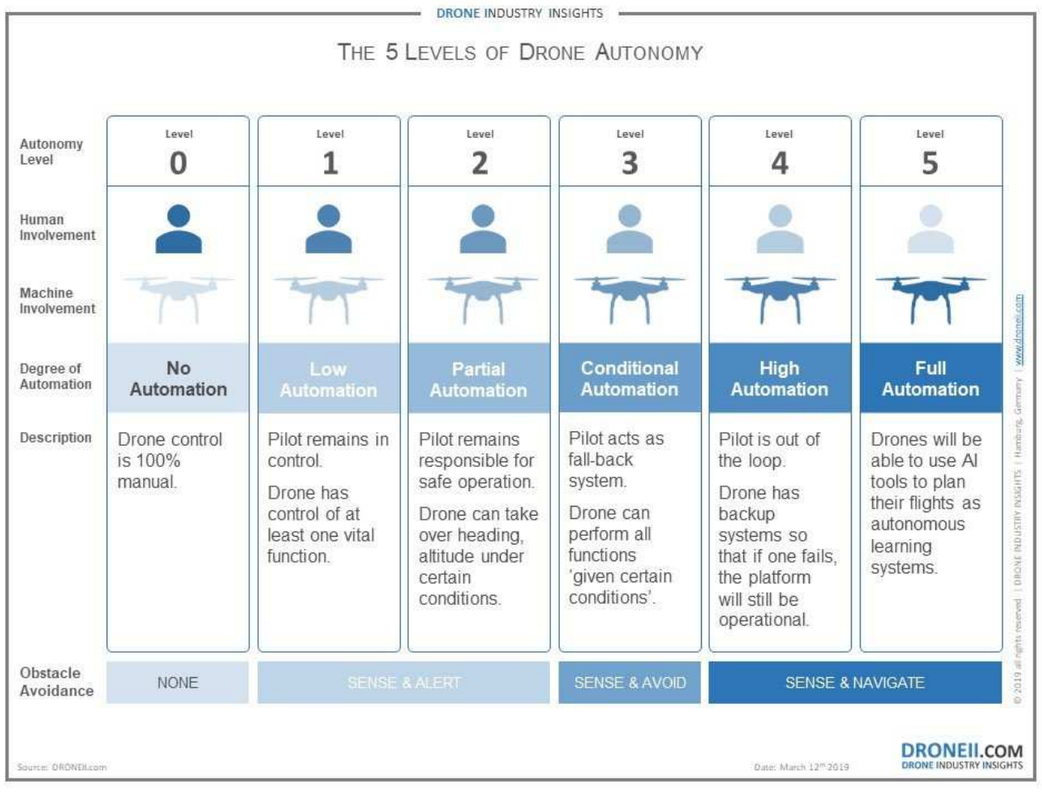
Future of Drones in Construction

The Connected Job Site

- Fully Autonomous Flights



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Future of Drones in Construction

Attachments

- CivDrone for Setting Out.
- LiDAR
- Caged Drones for Inspection

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Future of Drones in Construction

Integration with BIM

- Measurements within the CDE and compared against the BIM model.

- Raising RFI's or tasks against drone data within the CDE.

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What Do I Need?

How to get started with a Drone Programme.

- Identify persons best suited for the role.
- Set your budget.
- What type of drone do you need?
- How often do you want / need drone data from a particular project?
- What do you want to do with the information?

Thanks for Listening

Any Questions?