Drones in the Construction Industry

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What are Drones?

- Unmanned aerial vehicles
- Types of Drones
  - Fixed Wing (flies one direction only)
  - Rotary Blade (can hover and fly in any direction)
- Generally controlled by a person, but variations include ‘auto-pilot’ drones, or completely technology driven drones
- Size can vary between ‘toy’ planes to real helicopters
Benefits of Using Drones in Construction

- Aerial Surveys
- Worksite Surveillance
- Safety of workers
- Real time inspection of structures
- Keeping the Client informed

AECOM, Bechtel, DPR, France’s Bouygues are among some companies who have experimented with drones on the Project site.
Benefits: Aerial Surveys

- Before starting a project, drones can be used by surveyors and construction firms to conduct aerial inspections and evaluations of a site.

- Aerial imagery can be measured against tools such as Google Maps to calculate site dimensions, height restrictions, and access points.

- Drones can be used where the Project is in space restricted areas, where traditionally helicopters can have difficulty accessing.

- Saves time and cost – plane / helicopter hire (with associated fuel costs).
Benefits: Worksite Surveillance

- Drones can be used at night to protect against theft and trespassing.

- Drones can be deployed to monitor whether health and safety standards are being complied with.

- Drones can be used to monitor whether planning or contract requirements (e.g. light or noise pollution) are being complied with.

- Data derived from drones can be sent live-stream to Clients to demonstrate compliance.
Benefits: Safety of Workers

- Drones can be used to survey hard-to-reach areas such as under a bridge so that deployment of workers can be more focused and less risky.

- Saves time and cost – drone reconnaissance of hard to reach areas means the right workers and right equipment can be deployed first time.

- Eventually drones may be able to transport tools and equipment to workers in hard to reach areas so as to reduce to cost and time and improve safety.
Benefits: Real time inspection of structures

- Drones can be used to provide real-time reconnaissance and surveillance to visually confirm something has been installed correctly.

- Instead of cameras, drones can be fitted with infra-red or light sensors to determine risk-areas and inefficiencies (e.g. heat leakages).

- Data from drones can be sent to HQ via the cloud to be analysed alongside the Project programme or BIM models to give a clearer picture of:
  - how the structure is likely to look
  - progress and the critical path
  - progress compared to costs incurred
Benefits: Keeping the Client Informed

- The data, imagery, footage, analytics etc can be sent to the Client in real-time or stored to be referred to when required.

- As technology develops, footage from drones could be paired with virtual reality devices to allow the Client to ‘walk or fly around the Site’ from a completely remote location.

- Clients can receive more accurate and ‘real-time’ updates on how the Project will look, as well as costs and progress etc.
Current Legislation

- Drones (unmanned aerial aircraft) are regarded as aircraft and must comply with aviation legislation.

- The rules covering drones are currently set at UN level, by the International Civil Aviation Organisation (ICAO), the UN body dealing with civil aviation.

- ICAO allows drone usage provided a national authority gives a specific authorization, but it has also set a general timeline for integrating all drone classes:
  - By 2018 – initial integration into non-segregated airspace (i.e. where manned aircraft also flies).
  - By 2028 – full integration, i.e. so that drones can communicate with air traffic control

- To avoid case-by-case authorization process, the UK has adopted legislation for simple operations by smaller drones. This is set out in the Aviation Navigation Order 2009 (ANO).
UK Legislation

The regulator for the use of drones for commercial purposes is the Civil Aviation Authority (CAA).

All civil aircraft is subject to the Air Navigation Order 2009 (ANO), Articles 166 and 167 of the ANO provide specific guidance for drones weighing less than 20 kg.

The ANO provides that:

- **Control**: “The person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can safely be made”

- **Line of Sight**: “The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions”

- **Commercial Purpose**: “The person in charge of a small unmanned aircraft must not fly the aircraft for the purposes of aerial work except in accordance with a permission granted by the CAA.”
UK Legislation – flight path restrictions

- The ANO also provides that small drones (below 20 kg) must not be flown:
  - over or within 150 metres of any congested area
  - over or within 150 metres of an organised open-air assembly of more than 1,000 persons
  - within 50 metres of any vessel, vehicle or structure which is not under the control of the person in charge of the aircraft
  - within 50 metres of any person except during take-off or landing,
  - Even during take-off or landing, the aircraft must not be flown within 30 metres of any person except for the person in charge of the aircraft.

- Small drones also must not be flown: (i) above 400 feet above the surface; or (ii) within air traffic zones without specific permission from air traffic control units.
Gaps in the legislation?

- Privacy? Data Protection Act?
- Trespass?
- Nuisance?
- Deemed corporate knowledge?
- Personal injury or damage to third party property?
Legal Issues: Privacy

- Currently the rules dealing with privacy and drone use are dealt with under the existing legislation covering CCTV surveillance.

- There is no proposed legislation to cover the additional surveillance capabilities of drones compared to CCTV.

- The guidelines for CCTV (and drones) are set out by the Information Commissioner’s Office (ICO), the ICO advises for drones that:
  - A privacy impact assessment be carried out before drones are used
  - Placing signage notifying drone use around the Project site
  - Ensuring drone pilots wear highly visible equipment identifying themselves as drone operators
  - Adopt design mechanisms to protect privacy, e.g. non-continuous video recording
  - Store all information collected safely – encrypting information and storing information for the least amount of time possible
Legal Issues: Data Protection Act

- As drone use will likely involve (even inadvertently) collection of images of identifiable individuals, footage caught on drones will likely be subject to the Data Protection Act (DPA).

- The DPA includes requirements on:
  - the collection of images
  - storage of images
  - use of images
  - Providing notice to individuals that their information is being stored and obtained
  - security of images

- Note: EU reform of data protection laws – regulation aiming to be in place by year end.
Legal Issues: Nuisance and trespass

Flying drones in airspace may trigger claims for nuisance or trespass. It is likely that flying over homes and property of individuals cannot be avoided.

- **Trespass**: an unauthorized entry upon land, which invades that person’s right to exclusive possession of the land.

- **Nuisance**: an unreasonable or unlawful use of property in a manner that substantially interferes with the enjoyment or use of another individual's property, without an actual trespass or physical invasion to the land.
Legal Issues: Damage to property or person

- A crash on your Project site could cause property damage to your work, property damage to the work of other contractors, or personal injury to anyone on the site.

- A crash off the job site could cause property damage and personal injury to third-parties.

- Operators of drones may need to ensure that they have adequate insurance policies in place.
Legal Issues: Insurance Policies

- The Civil Aviation Regulations 2005 state that aircraft operators are required to hold adequate insurance to meet their liabilities in the event of an accident, including third party accident insurance.

- As this is a new area, damage caused by drone use is unlikely to be covered in most companies’ general policy.

- The insurance industry is developing policies to cover drones, but in most cases this is still a work in progress as the full scope of drone risk is being determined.

- Operators of drones will have to negotiate specific endorsements or enter a drone specific policy.
Legal Issues: corporate knowledge

Could drone usage actually increase commercial risk?

- Many contracts require claims for extensions of time or additional payment to be made within a certain time of knowledge – often this is hard to pin down.

- With drone use, it may be possible to capture on camera the event giving rise to that claim.

- Should the companies’ time of knowledge be judged by the date is what captured on camera by the drone, i.e. deemed knowledge?

- What if the footage is only analysed later? Could this give rise to a time bar?
Legal Issues: corporate knowledge contd.

- What if your drone footage captures illegal activity on site?
- What if your drone footage captures illegal activity off site?
- Is there a duty to report? If so, who to?
- If a company doesn’t report an illegal activity, could it be considered complicit in the activity?
- Might this ability to continuously monitor raise concerns of a “corporate big brother”?
Any questions?

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