Zero incidents
Zero harm
Zero compromise
Keeping you healthy and safe, every day at work.

ESSENTIAL STANDARD no.28

Working with Drones

Thames Water

KEY MESSAGES

- Ensure drones are airworthy and the operators are licensed by the Civil Aviation Authority.
- Have the correct permissions in place before flying.
- Operators must be trained and competent to fly drones.
- Operators must have visual line of sight of their drone at all times (unless flying within a confined space, see Section 6 below) – don't fly further than 500m horizontally away (from the operator) or higher than 400 feet.
- Never fly near aircraft, helicopters, airports and restricted airspace.
- Always follow the drone manufacture's instruction when flying.
- Drones used for Thames Water company business will require a Thames Water Operational Safety Authorisation (TWOSA or eTWOSA). Thames Water is also required to maintain a log of all flights undertaken on its behalf. See section 5 below for details.

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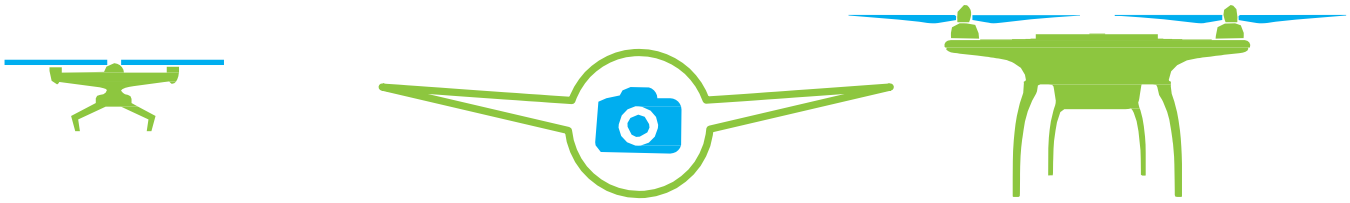
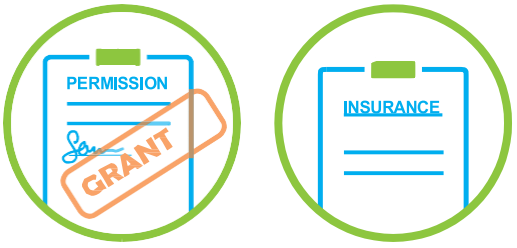
1. Introduction

Drones, also known as remotely piloted aircraft systems or unmanned aerial vehicles, come in a variety of shapes and sizes, ranging from small handheld types up to large aircraft, a similar size to airliners. Their usage is rapidly increasing due to their myriad of applications, such as taking still images or video footage using conventional, zoom or even thermal imaging cameras.



Just like any other aircraft, an unmanned aircraft must be flown in a safe manner, both with respect to other aircraft in the air and also to people and properties on the ground.

2. Permissions to Fly a Drone



Before flying a drone, you must obtain the following:

- Operation Authorisation (previously known as PfCO) from the Civil Aviation Authority (not required for confined space flights).
- public liability insurance (minimum of £2 million)
- permission to take off and land from the landowner
- permission from the National Air Traffic Services when flying in any restricted airspace

It is also good practice to notify the National Air Traffic Services.

Drones used for Thames Water company business will require a Thames Water Operational Safety Authorisation (TWOSA or eTWOSA). Thames Water is also required to maintain a log of all flights undertaken on its behalf. See section 5 below for details

3. Training and Competence

Operators flying the drone must hold a certificate of competency from a recognised National Qualified Entity approved by the National Air Traffic Services and have passed a flight assessment. Without this, the operator will not be able to obtain the relevant permissions. This should include ensuring any medicals are in date.

4. Planning the Flight

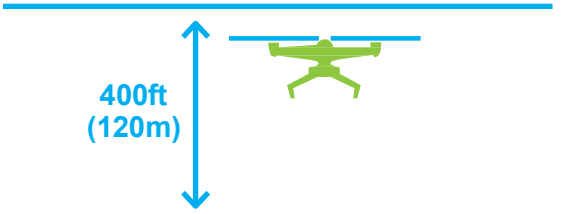
Carry out a **pre-site risk assessment**, taking into account, but not limited to, the following:

- weather
- geographical locations
- airspace
- all necessary permissions

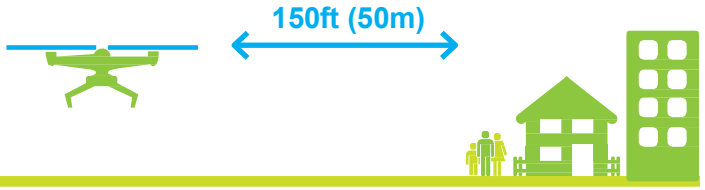
Carry out an **on-site risk assessment** and do not fly if it is unsafe to do so.
To keep safe, always follow the Civil Aviation Authority drone code:

D **D**on't fly near restricted airspace – remember this is not always an airport

R **R**emember to stay below 400ft (120m)

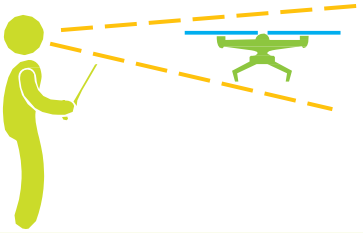


O **O**bserve your drone at all times and stay 150ft (50m) away from people and property (when flying outside)



N **N**ever fly near aircraft

E **E**nsure that you fly safely and legally



5. TWOSA and Drone Flight Log

Drones used for Thames Water company business will require a Thames Water Operational Safety Authorisation (TWOSA or eTWOSA). In addition, Thames Water is also required to maintain a log of all flights undertaken on its behalf.

To obtain a TWOSA:

1. Submit TWOSA / eTWOSA to the Site Manager, Controller of Premises or Project Manager for the site or project that the drone activity is being requested for.
2. The Site Manager, Controller of Premises or Project Manager reviews the RAMS for the task itself and ensure these are adequate to undertake the work on the Thames Water site or project site.
3. The Site Manager, Controller of Premises or Project Manager forwards the following Pre Flight Check List data to *Pritesh.Hirani@thameswater.co.uk* who will check to confirm that suitably qualified pilot is being used for drone flights.
   - Flyer ID for each Pilot
   - Each Pilot proof of GVC (General Visual Line of Sight Certificate)
   - The Operator ID for the company
   - Name of the Accountable Manager or name of the person that the company used when they registered for the Operator ID
   - Site name for the flight
4. When this confirmation is received, the Site Manager, Controller of Premises or Project Manager will then approve and issue TWOSA / eTWOSA.

Logging drone flights:

Once flight(s) have been completed, the pilot must complete the *Thames Water Drone Flight Log*. (Click the link to access the form). The pilot will be required to enter the following fields:

1. Company name
2. Contact email address
3. Contact telephone number
4. Flight reference number
5. Date of the flight
6. Take off time (using 24-hour clock)
7. Landing time (using 24-hour clock)
8. Flight duration (in minutes)
9. Flight location
10. Airspace class (A, C, D, E, or G)
11. Remote pilot name
12. Remote pilot flyer ID
13. Type of flight (day / night)
14. Name of person requesting the flight
15. Details of any observations or incidents that occurred during the flight

6. Drones within confined spaces or potentially explosive atmospheres

This section sets out controls that must be in place to reduce the risk of explosion and injury to Thames Water staff or contractors and the public when flying drones within confined spaces and / or potentially explosive atmospheres. (For example, Thames Water wastewater networks have been designated as either Zone 1 or Zone 2 in line with the DSEAR assessment process).

Risk Mitigation

The use of drones within a confined space or potentially explosive atmospheres can mitigate the risk of sending people into high-risk environments. With the correct controls in place the risk can be controlled to an acceptable level protecting our staff, the environment and our infrastructure from the risk of explosion causing serious harm.

Safety Controls

Prior to flying a drone in confined spaces and / or potentially explosive atmospheres, a SHE4/RAMS must be in place capturing the relevant controls and detailing a contingency plan should failure of the drone occur. The contingency plan must include the method of retrieval of the drone.

The Independent Authorising Body (IAB) must be notified so that drone flights in confined spaces and / or potentially explosive atmospheres can be coordinated with other activities and personnel entries.

Note: should a person entry be required to retrieve the drone, an additional notification and a consultation with the Independent Authorising Body (IAB) must take place and the entry approved prior to the retrieval being carried out.

Drones authorised to fly into confined spaces or areas with potentially explosive atmospheres must be fitted with an on-board calibrated and tested gas monitor. Gas monitor sensor should be set to alarm at 10% (A1) and 20%(A2) of the Lower Explosive Limit, (LEL), for the wastewater environment or for the relevant hazard limits within the potentially explosive atmosphere.

Preflight checks/controls

- Designate a safe take-off and landing zone for the drone, to which access is controlled. If entry points are in publicly accessible areas, there may be the requirement for drones to take off within a tent, to further protect and separate the public from the equipment.
- Visually inspect the drone unit and its protective cage.
- Prior to flight into a confined space/potentially explosive atmosphere the area should be suitably ventilated, and gas checked.
- Ensure range extender transmitter (where used) is adjacent to a gas monitor.
- Conduct a pre-inspection of the drone, range extender and batteries, to ensure all equipment is undamaged prior to flight and that a “health check” is carried out on all batteries.
- Drone flight MUST immediately cease, (or be cancelled if not already started), if a gas monitor alarms or is not in correct working order. Flights MUST NOT start if the drone is not fitted with a gas monitor.

During flight controls

- If a fault alarm arises from a gas monitor, stop the survey immediately. Fly the drone out of the

confined space or land the drone at a safe location, ideally at the takeoff point, and power it down.

- Stop activities and cancel drone flight if gas monitor alarm is triggered

Note: during confined space flights it will not always be possible for the pilot to keep in visible contact with the drone, more reliance is needed on the camera view to keep the drone safe and on track.

For additional information contact your H&S adviser or the IAB.