Trendspek

Capture Guide

Pro Tips for Aerial Drone Surveys of Oil and Gas Assets

What's in the guide

Trendspek's Oil and Gas Capture Guide combines 15+ years of enterprise drone pilot experience to assist you in achieving an optimal capture, every time.

In this comprehensive guide, you'll find diagrams and pro tips for:

This Capture Guide has been created in collaboration with: HD IMAGERY

FLIGHT SETTINGS

Vertical Capture

To achieve a 1.5mm resolution 3D photogrammetry model set up your flight parameters using the the settings below.

When planning the flight area, include additional margin to ensure the façades are fully captured in frame.

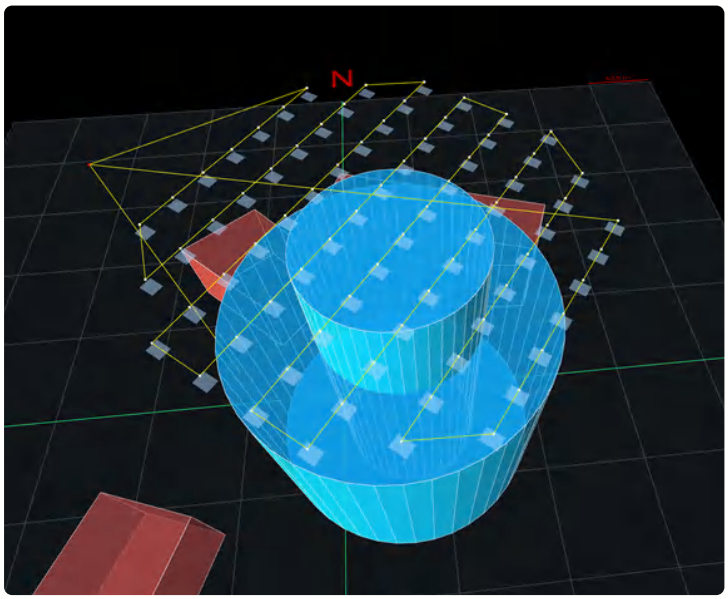
Please note these flight parameters are based on a DJI Mavic 3 Enterprise , you will need to change your parameters to the particular drone you are using to achieve 1.5mm GSD

PRO TIP: Use RTK if available

PRO TIP: Be mindful of additional hazards when planning GSD such as heat plumes, pressure relief valves and fire detection systems.

Flight 1: Roof Capture

Flight Parameters	Values
Mission Type	Top Down (Nadir)
Target offset	Roof height plus 12m
Speed (M/S)	Maximum 2m/s
Overlap	75/75
Gimbal Pitch	-90°



Roof capture camera positions via Drone Harmony App

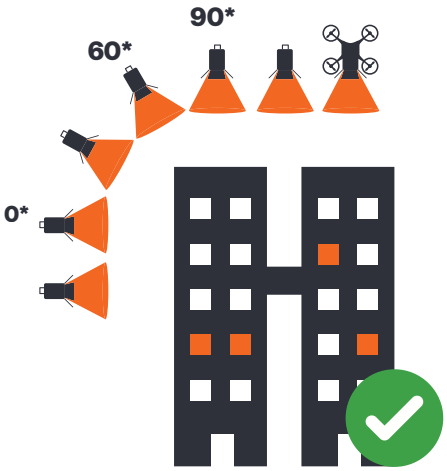
FLIGHT SETTINGS

Transition Tips

Transition photos

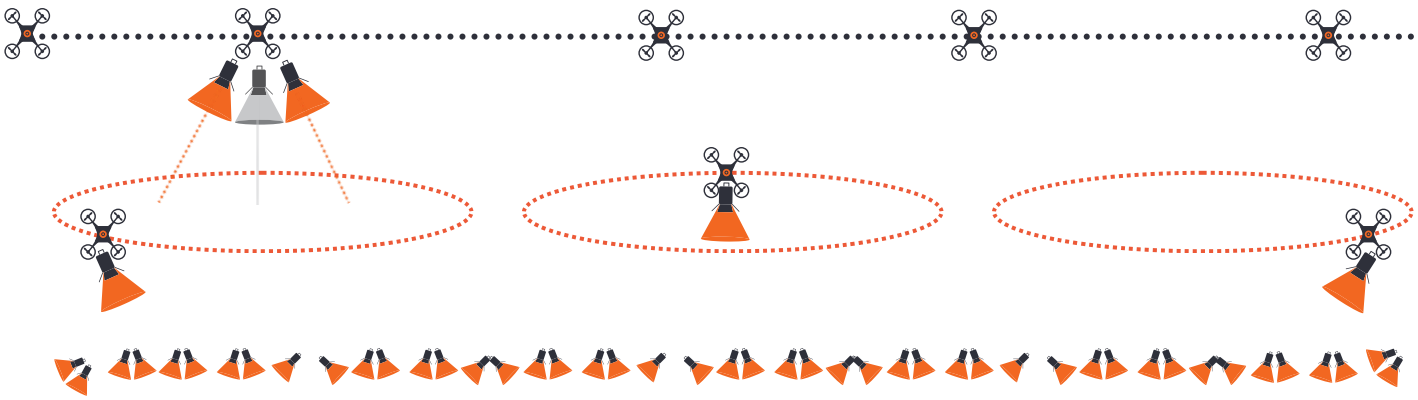
One of the most significant issues in drone capture is a lack of transitional imagery, which can lead to incomplete or fragmented corners of vertical structures. You can resolve this by:

- Aiming for a minimum of one image per 30° when transitioning around corners or;
- If mixing distances, try to include a "transition" distance and avoid going from far to really close.



See diagram below as an example.

PRO TIP: For intricate or detail-heavy assets, increase the amount of transition shots to 1 image per 10°



FLIGHT SETTINGS

Transitional Capture

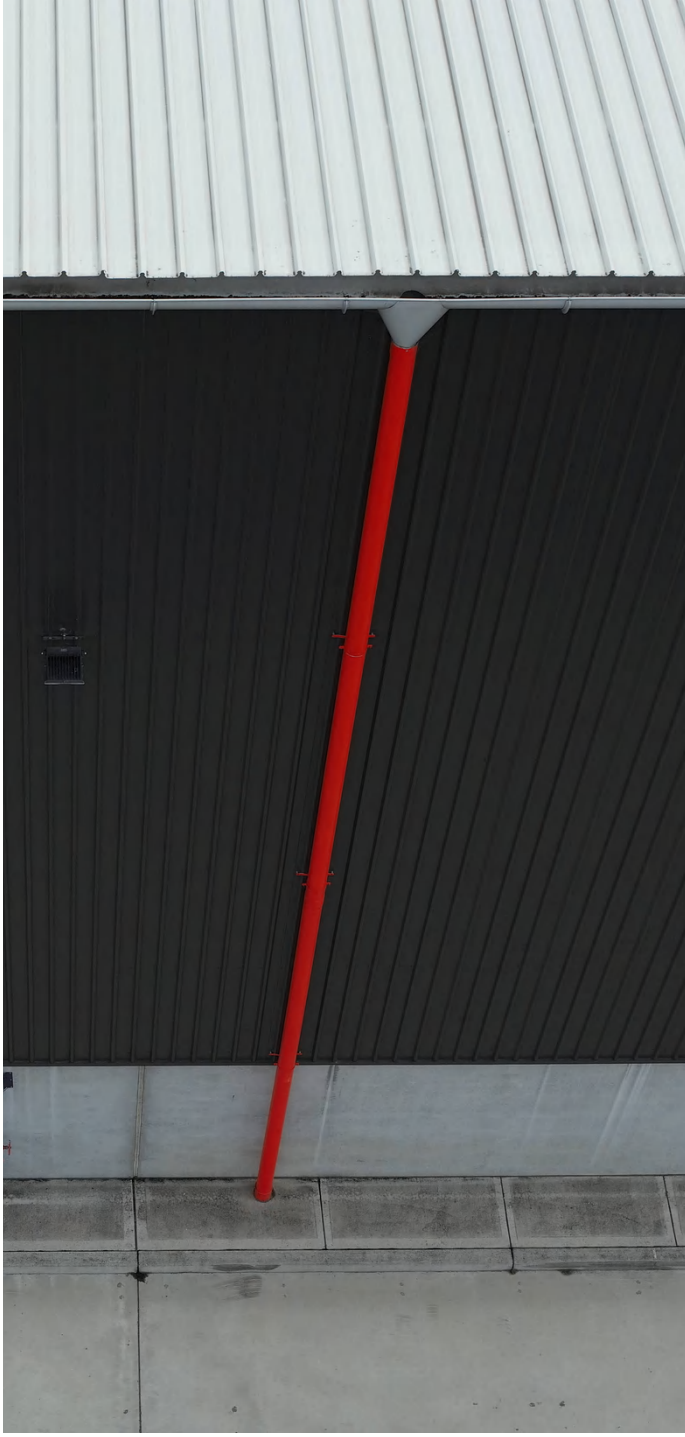
Ensure you have transitional imagery between the roof and façades/elevations for a complete model.

To capture successful transitional imagery, you will need to ensure you are able to see the roof, façade and hardstand in each image, please see an example of the image on the right

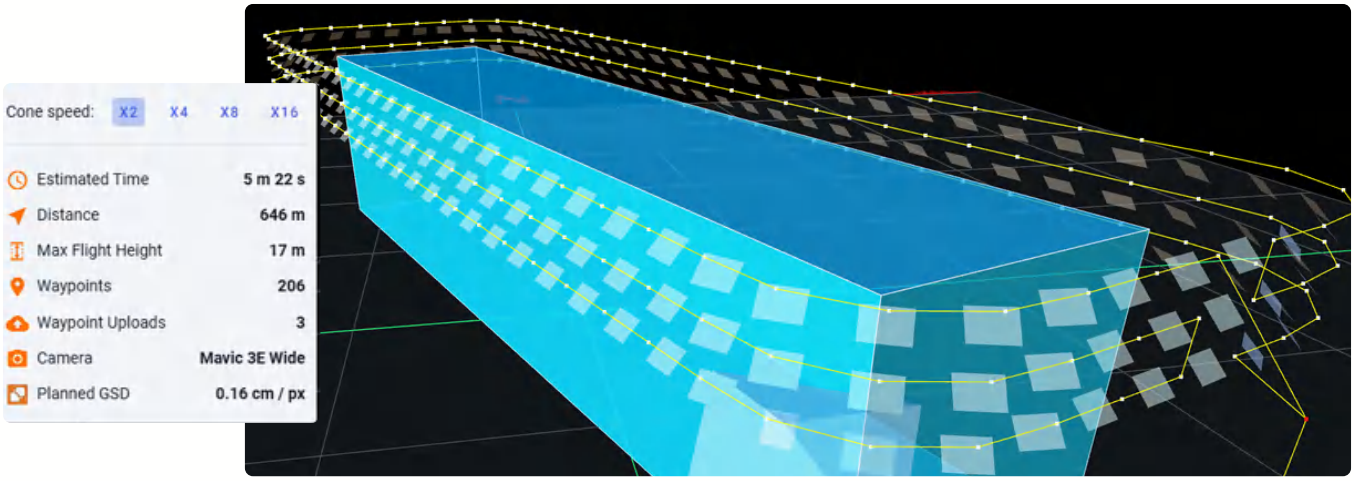
Please note these flight parameters are based on a DJI Mavic 3 Enterprise. You will need to change your parameters to the particular drone you are using to achieve 1.5mm GSD

PRO TIP: Use RTK if available

Flight Parameters	Values
Mission Type	**Manual Orbit**
Target offset	**Reduce the height by 5-6 meters from the roof offset.**
Speed (M/S)	**Maximum 2 M/S**
Overlap	**75/75**
Gimbal Pitch Lap 1	**60-70°**
Gimbal Pitch Lap 2	**40-50°**



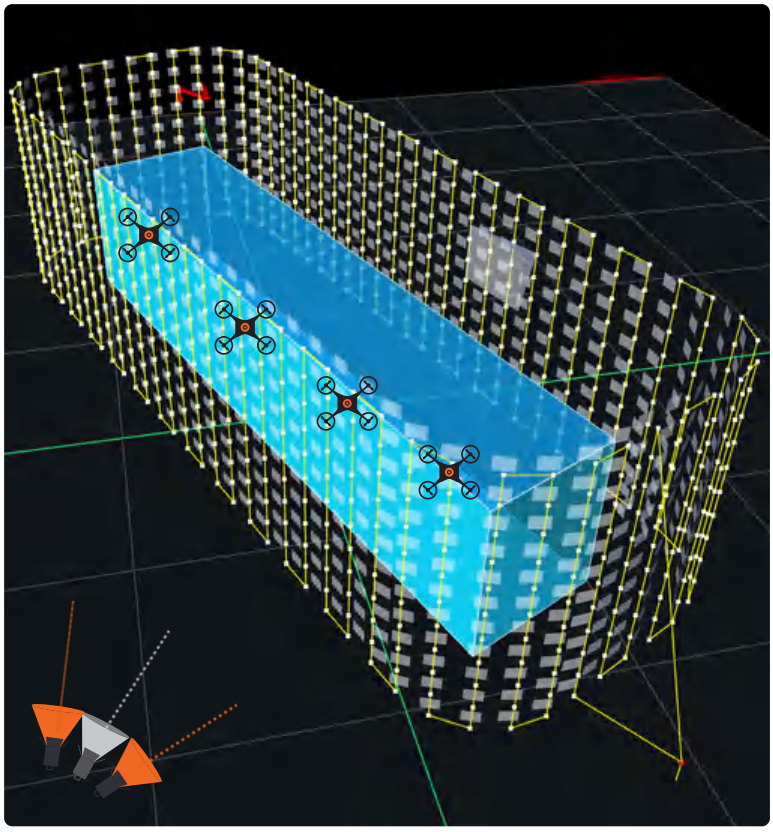
Example of successful transitional imagery



Graphic courtesy of the Drone Harmony App

FLIGHT SETTINGS

Lattice Capture



Side Profile

Consider flying flight lines with the camera slightly tilted up, with the alternate flight line having the camera tilted down, thus enabling a better render of your 3D model.

Height change between each photo should equate to 75% overlap

Recommended overlap 75/75

To calculate the correct offset distance for your specific drone/camera please consult the Trendspek offset calculator.

Face-on profile

With intricately detailed facades, consider completing an extra flight/s with the camera either panned to the left and/or right instead of directly facing the facade.

If including top-down components such as roofs or hardstands, include transition imagery (Page 5).

Lattice Capture

For lattice capture, repeat flight lines with the camera slightly tilted upward.

On alternating flights, pan the camera left and right while tilting it slightly downward.

This variation in angle and direction enhances the quality and detail of the lattice.

FLIGHT SETTINGS

Platform Captures

Platforms should be captured at the resolution requested on your brief.

These flight settings are based on 1.5mm resolution, some captures may need to be sub mm based on the requirements of the brief.

Please note these flight parameters are based on a Larger DJI drones (M300/M350/M400) Enterprise. You will need to change your parameters to the particular drone you are using to achieve <1 mm GSD.

Some captures may need to be manually flown to capture as close to 100% of the asset as possible.

PRO TIP: Use RTK if available

Flight Parameters	Values
Mission Type	**Manual**
Target offset	**8m**
Speed (M/S)	**Maximum 2 M/S**
Overlap	**75/75**
Gimbal Pitch	**+ or - 90° Depending on capture surface**

Some considerations:

- Simultaneous Operations (SIMOPS) Production State
- Helicopters
- Crane use
- Weather conditions, including sea state and wind

FLIGHT SETTINGS

Module Asset Captures

Module Assets should be captured at the resolution requested on your brief. These flight settings are based on 1.5mm resolution

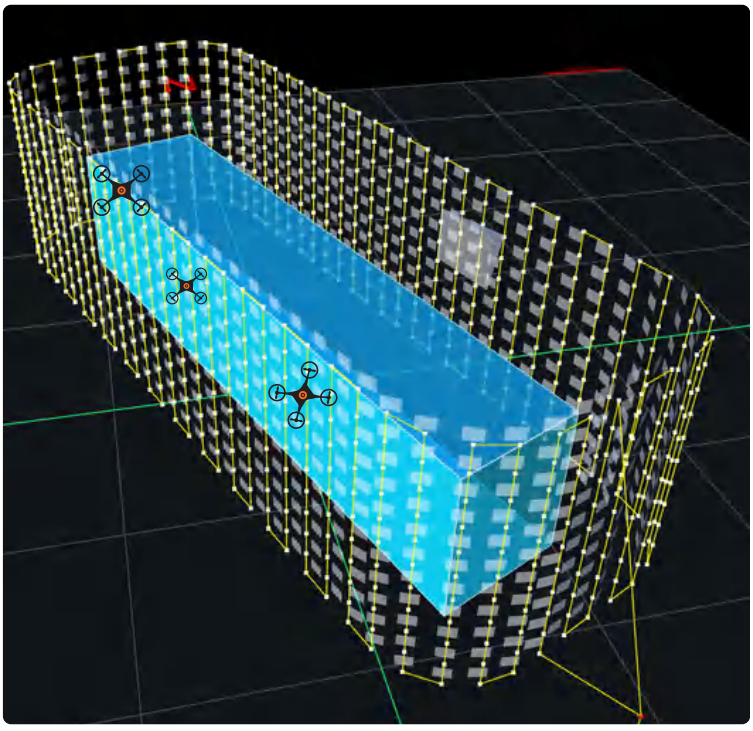
Please note these flight parameters are based on a DJI Mavic 3 Enterprise and you will need to change your parameters to the particular drone you are using to achieve 1.5mm GSD.

PRO TIP: Use RTK if available

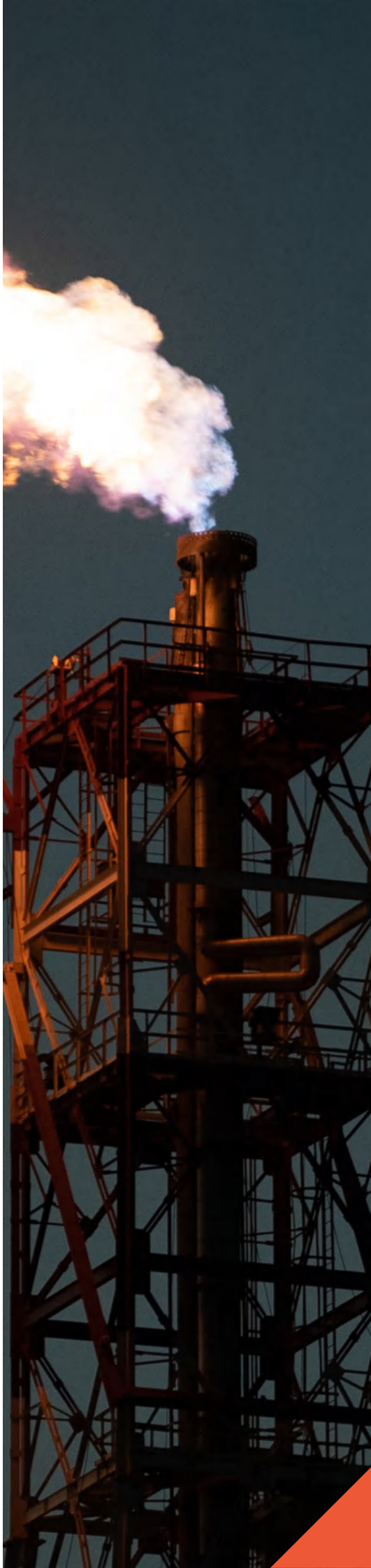
PRO TIP: Use a smaller drone that has at least 20MP sensor, that will help with coverage

Flight 4: Facades Capture

Flight Parameters	Values
Mission Type	Manual
Target offset	12m
Speed (M/S)	Maximum 2 M/S
Overlap	75/75
Gimbal Pitch Lap 1	90° (Degrees)



Graphic courtesy of the Drone Harmony App



CAPTURE CONSIDERATIONS

Materials and Weather Tips

Most capture for Oil and Gas assets takes place in live environments/plants. It's best to consider the following, to ensure your captures are appropriately planned and delivered with minimal damage or impact to equipment.

Certain types of surfaces materials that may cause artefacts (holes in the model) may require multiple days to capture.

These type of materials include

- Stainless steel
- Carbon steel
- Insulation wrapped
- Wet/Icy surfaces

Material considerations

- Some of these materials will have different reflectance properties.
- Some assets will present shadowing and may cause processing misalignments, such as pipe racks. These may need to be captured on overcast/less sunny days.
- These type of materials may also require multi-sensor captures or different capture techniques, such as walking and hand holding the drone to complete a 100% coverage of the asset.

Weather considerations

Planning your flights around wind speeds and direction will ensure equipment is clear of line of fire.

Consider the following when planning your flight:

- Fly upwind where possible from Flares, Stacks, Pressure Relief Valves (PRVS).
- Avoid flying in close proximity to automated plants, as the sudden release of heat plumes may cause damage the drone.
- Consider sea state: depending on the swell, the asset may be moving and the drone may be stationary, this will affect target offset calculation.

CAPTURE CONSIDERATIONS

Data Handling

Drone captured data for oil and gas assets is often sensitive, containing high resolution imagery. Secure and compliant handling of this data is essential not just for operational value but also for meeting regulatory and client specific requirements.

Why This Matters

Even a minor data breach or mishandling event can result in serious consequences, including operational delays, non-compliance with regulations, and loss of client trust. Secure data handling ensures the integrity of insights, supports legal obligations, and maintains confidence in the process.

Handling Guidelines

Secure Transfer

All data must be uploaded using encrypted HTTPS channels to protect against interception and tampering during transfer.

Access Control

Only authorised personnel should have access.

Retention and Disposal

Data is retained might be different for every client and jurisdiction. Data must be handled in accordance with your clients data handling policies and securely deleted when no longer needed, including removal from backups, in line with the relevant Information and Data Security Policies.

Regulatory Compliance

Comply with all relevant laws, including the relevant jurisdictions statutory Privacy Act and any additional obligations related to critical infrastructure or the oil and gas sector.

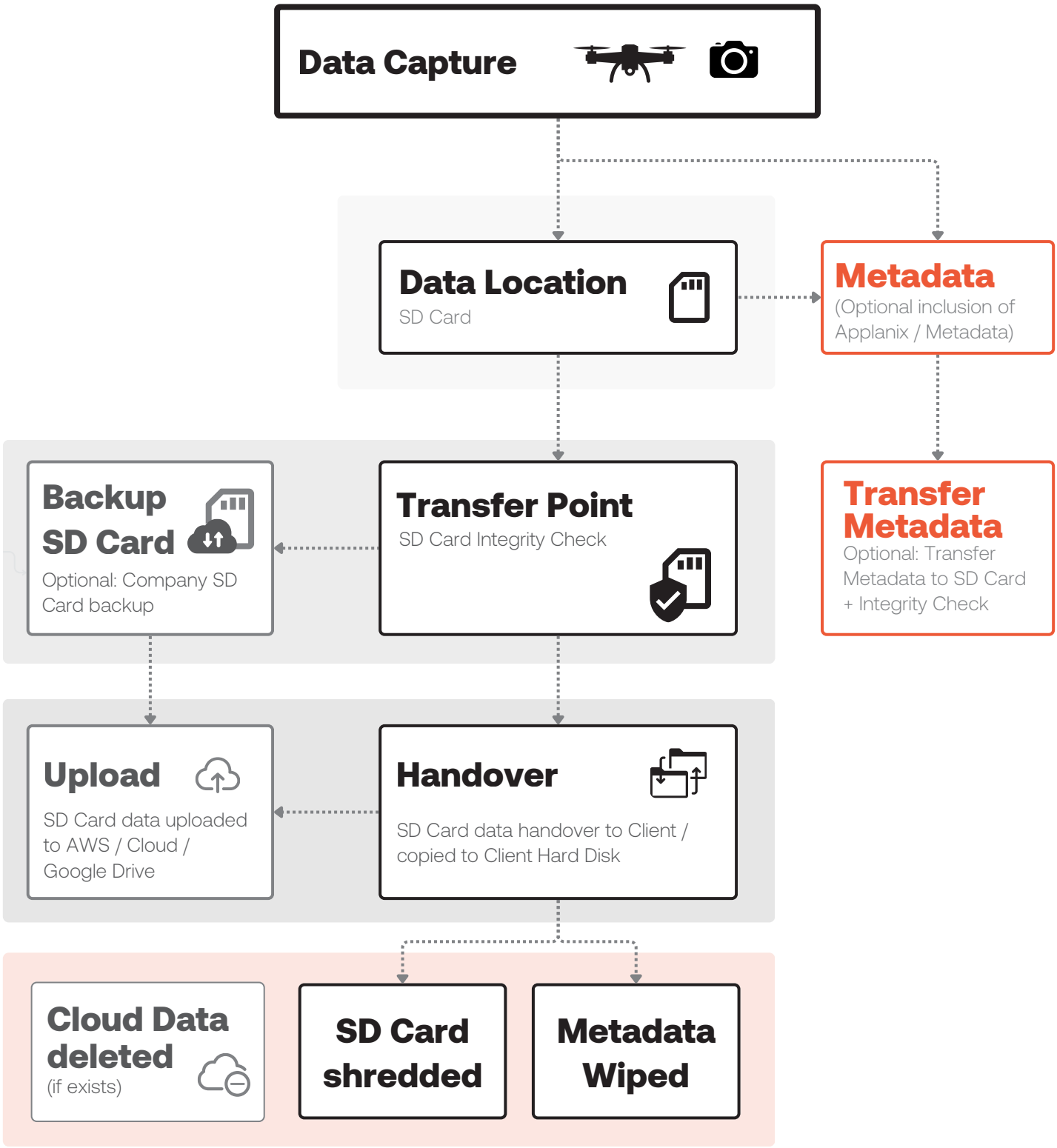
Client-Specific Requirements

Some projects may require tailored handling, such as shorter retention timelines or restricted access. These must be clearly defined at project start and followed throughout.

Data Checklist

- Upload data via secure HTTPS connection
- Confirm data is linked to the correct project
- Restrict access to authorised personnel only
- Review and apply any client-specific data instructions
- Follow internal data retention timelines
- Request permanent deletion when data is no longer required
- Report any data handling issues immediately

Drone Data Capture Workflow



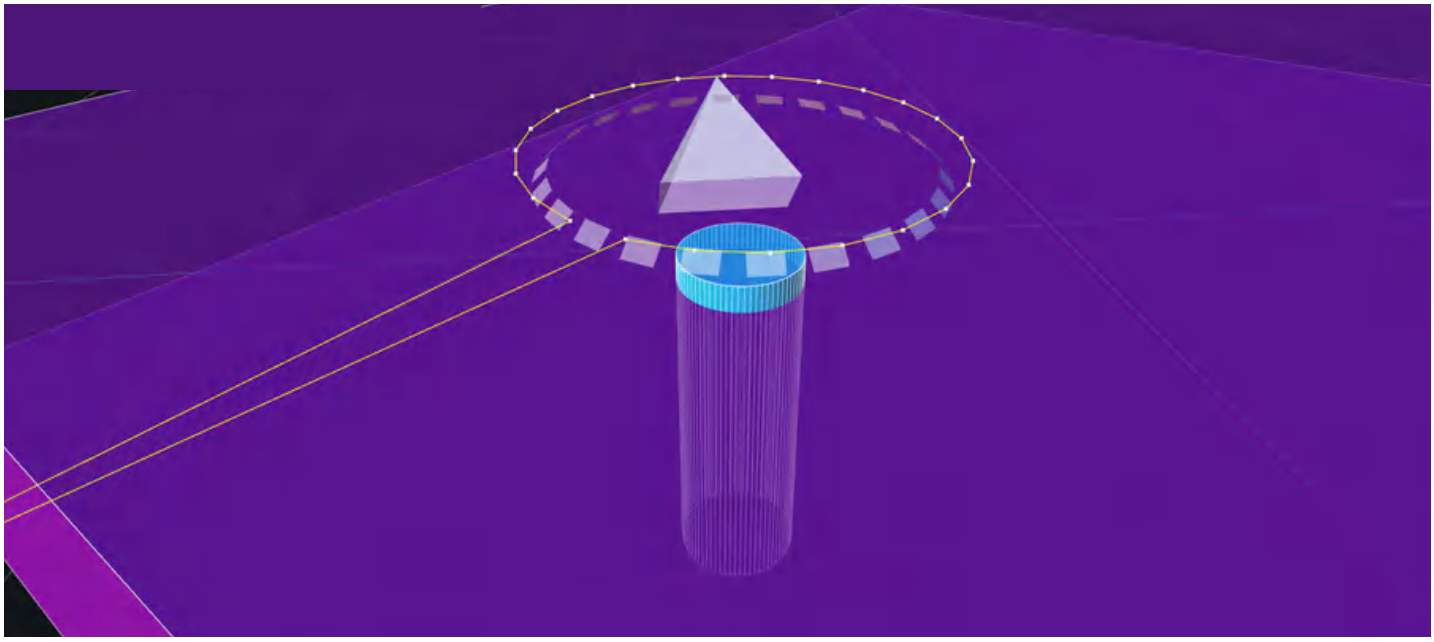
CAPTURE CONSIDERATIONS

Plant Equipment and Noticeable Damage

After completing your top-down mission, ensure to perform manual orbits to maintain the correct GSD as specified in your brief.

Capture the following if requested in your brief:

- Plant equipment
- Visible areas of damage



Graphic courtesy of the Drone Harmony App

CAPTURE CONSIDERATIONS

Drone Selection

The minimum recommended drone camera is a true 20 megapixels.

For anything less than this, please consult our capture team: delivery@trendspek.com

PRO TIP: Cameras with larger sensor sizes will produce superior image quality, with added benefits including:

- Capture more of the asset in one frame, meaning fewer overall photos
- Fewer flight lines needed, making it significantly quicker to capture
- Fewer obstacles avoided by flying higher

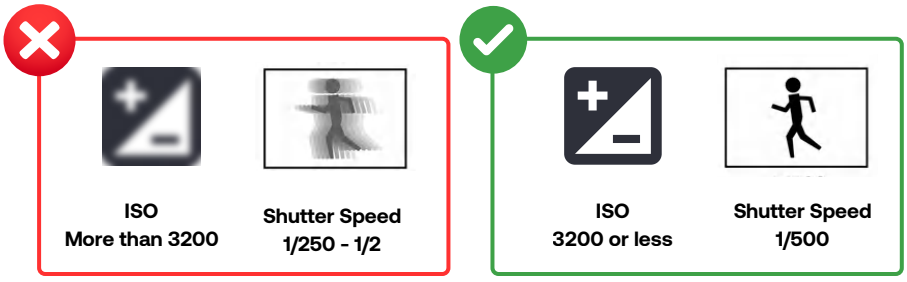
Camera Tips

When setting up your camera for capture, keep in mind the following:

PRO TIP: Where possible, select Manual White Balance (e.g. sunny or cloudy). Don't change these settings during capture, even if weather conditions change.

If using multiple drones, ensure the white balance matches for each drone.

PRO TIP: In darker conditions, avoid exceeding ISO 3200 or Shutter Speed less than 1/500, as this will result in grainy/blurry images



CAPTURE CONSIDERATIONS

Target Resolution (GSD)

When targeting a specific resolution or Ground Sample Distance (GSD), ensure accuracy when calculating the offset distance and adhere to it closely.

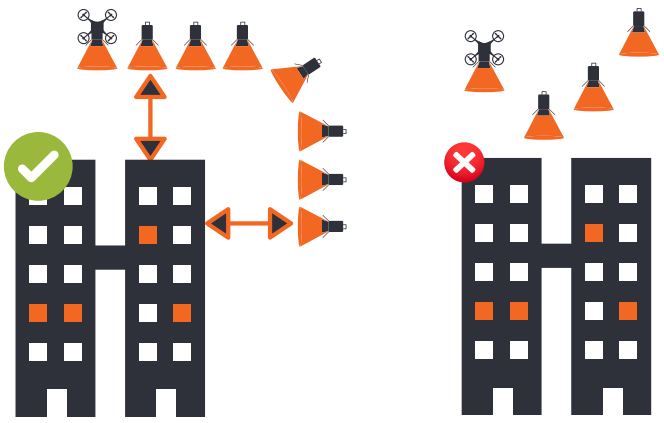
To calculate the correct offset distance for your specific drone/camera please consult the Trendspek offset calculator:

https://trendspek.com/resources/resolution-calculator

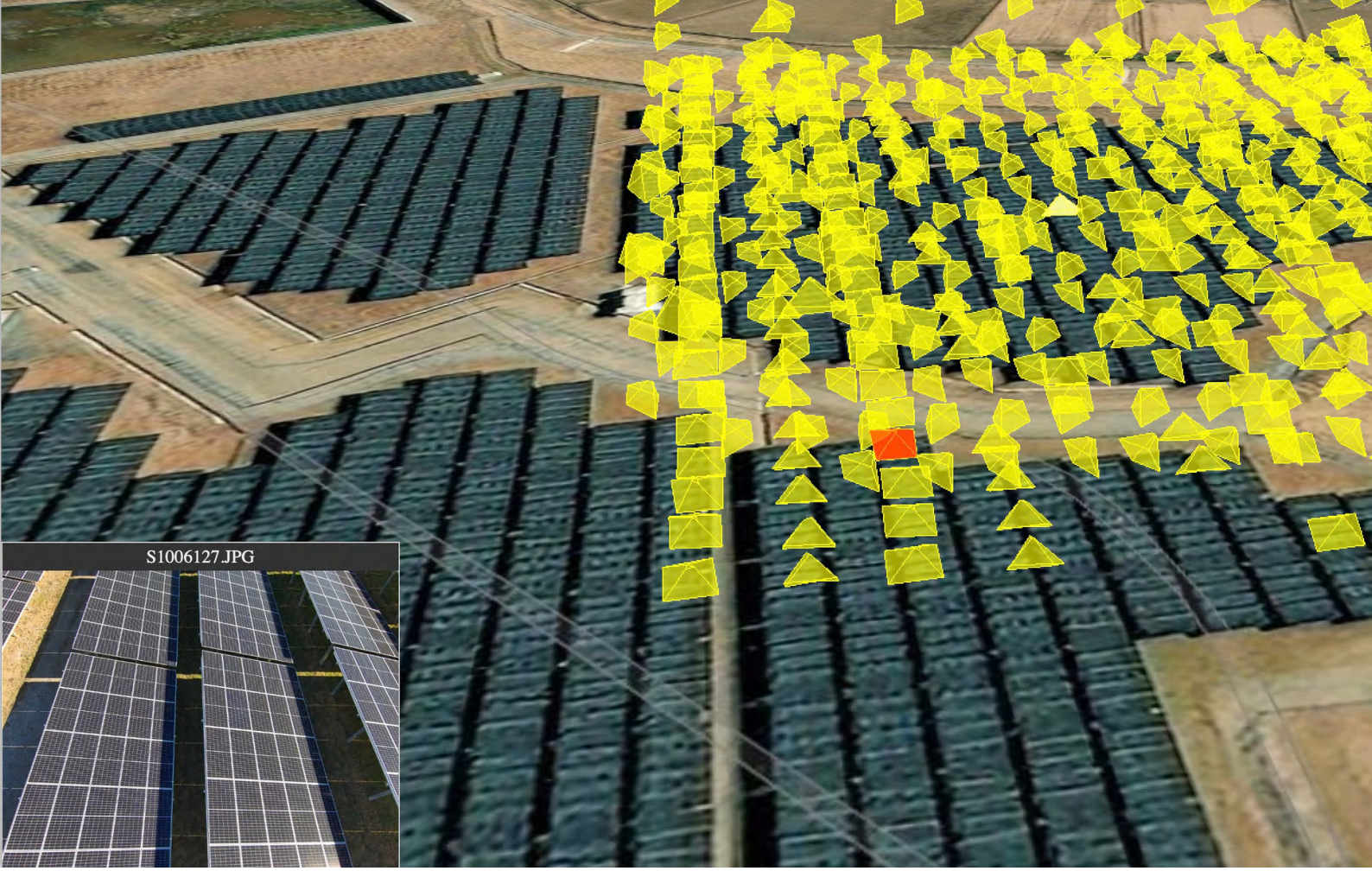
Recommended Apps

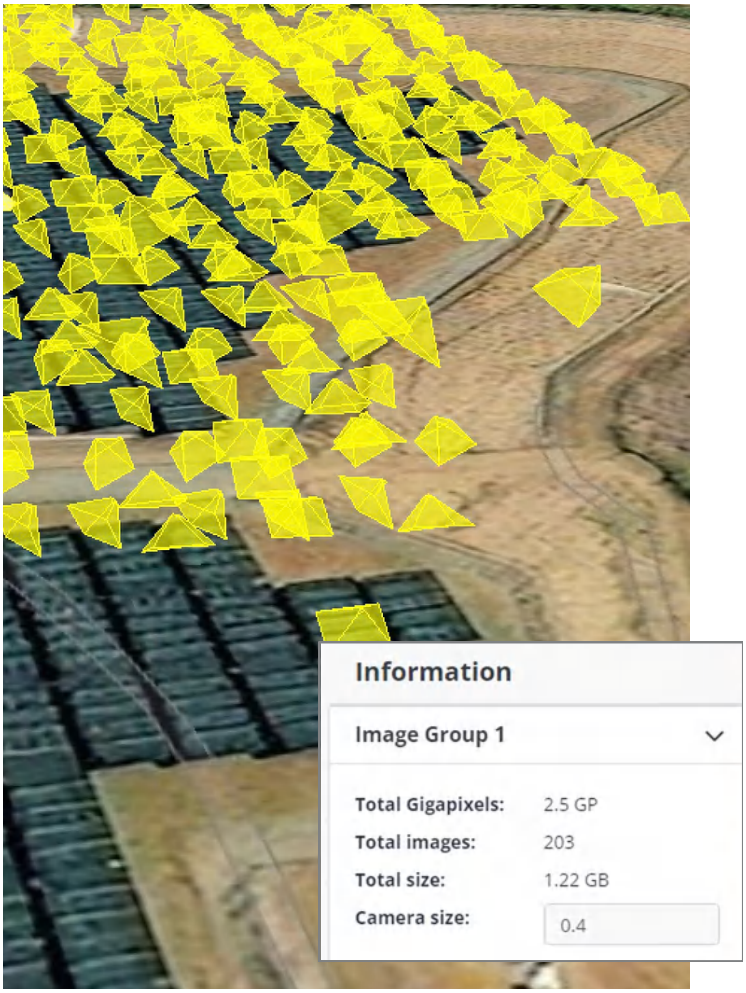
- DJI Pilot
- Drone Harmony
- Drone Link

PRO TIP: Maintain the correct offset throughout the entire capture. For example, if your target offset is 10m, measure the height of the roof and then add the 10m offset above the roof's height.



Maintain calculated offset





CAPTURE CONSIDERATIONS

Capture Analysis Tool

Check capture coverage while on-site for more complete 3D models

Trendspek's Capture Analysis tool allows you to verify that you've captured your whole asset while still on-site to ensure optimal coverage.

Accessible via the platform, this tool improves accuracy, resulting in better 3D models without the need for repeat site visits.

You will need a Trendspek account to use the tool.

Capture Analysis Tool

Capture Checklist

Asset .....

Camera/Lens .....

Target Resolution .....

Offset distance .....

Pre-flight checklist

- [ ] The capture plan includes the correct overlap of 75/75 and transition imagery
- [ ] Image ratio set (4:3 or 3:2)
- [ ] Image type set to JPEG
- [ ] Offset distance / Height above asset set
- [ ] Auto Focus set
- [ ] White balance set

Post-flight checklist (onsite)

- [ ] Images are in focus without motion blur
- [ ] Exposure is balanced correctly (No "blown-out" whites on the asset)
- [ ] Images have a consistent white balance
- [ ] Sufficient transitional imagery was captured (topdown - to verticals)
- [ ] Sufficient overlap was captured
- [ ] Validated with Trendspek's capture analysis tool

Data and Upload Checklist

- [ ] Upload data straight away to minimise risk of data loss, if not able create a second copy of the data
- [ ] Where feasible check images and remove any that are out of focus or blurry
- [ ] Ensure you name your upload with the address of the property in the following format:

  42 Wallaby Way Sydney

Prepared by

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