



Standard Operating Procedure (SOP): Drone Operations

H&M Surveying, LLC

Effective Date: January 1, 2020

Approved By: Dustin Mills, UAS Manager

Reviewed By: Corporate Office, Greenville, SC

1. PURPOSE

This SOP establishes standardized procedures for the safe, accurate, and legal operation of Unmanned Aircraft Systems (UAS or drones) in support of land surveying, topographic mapping, construction, and GIS services across all H&M Surveying offices.

2. SCOPE

Applies to all H&M Surveying field staff and offices utilizing drones for aerial data collection, including UAV-based LiDAR and orthophotography. All drone operations will comply with FAA regulations, H&M Surveying internal policy, and client requirements.

3. RESPONSIBILITIES

- **UAS Manager (Corporate):**
 - Approves and schedules all UAV deployments.
 - Maintains all FAA registrations and Part 107 certifications.
 - Manages maintenance, software updates, and inventory of UAV equipment.
 - Reviews flight logs and QA/QC reports.
- **Licensed Pilot-in-Command (PIC):**
 - Must hold an active FAA Part 107 Certification.
 - Conducts pre-flight planning and risk assessments.
 - Ensures compliance with all federal, state, and local regulations.
 - Responsible for mission execution and post-flight reporting.
- **PLS in Charge of Local Office:**
 - Coordinates with the UAS Manager for scheduling and data needs.
 - Reviews deliverables and ensures integration with ground survey data.
 - Verifies client-specific requirements are met.



4. EQUIPMENT & SOFTWARE

- **UAV Platforms:** DJI Matrice 300 RTK, DJI Phantom 4 RTK, WingtraOne
- **Sensors:** LiDAR, RGB, Multispectral (depending on project scope)
- **Software:** DJI Pilot, DJI Terra, AutoCAD Civil 3D
- **Storage:** Secure data upload to ShareFile with file naming:
jobnumber_date_initials_UAV (e.g., 25-009_251201_DM_UAV)

5. OPERATIONAL WORKFLOW

A. Requesting UAV Support

1. Office PLS submits request to UAS Manager via internal UAV Request Form (48-hour lead time recommended).
2. Request includes:
 - Project name/number
 - Location
 - Desired deliverables (LiDAR point cloud, orthomosaic, contours, etc.)
 - Client requirements or special constraints

B. Pre-Flight Procedures

1. **Mission Planning**
 - Review airspace restrictions (using tools like B4UFLY, LAANC)
 - Submit LAANC authorization if in controlled airspace
 - Check weather, NOTAMs, and site access
 - Confirm site control points are established or planned
2. **Equipment Check**
 - Inspect UAV, battery, propellers, sensors
 - Confirm firmware and software updates
 - Verify GNSS correction methods (RTK/PPK)
3. **Team Briefing**
 - Review safety plan and emergency procedures
 - Assign observer, if required
 - Review communication channels (radio/cell)

C. Flight Operations

1. Conduct takeoff from designated safe launch area
2. Maintain VLOS (Visual Line of Sight) at all times
3. Follow pre-programmed or manually piloted mission plan
4. Collect adequate overlap and redundancy for processing



D. Post-Flight Procedures

1. Download and back up raw data to external hard drive or secure server
2. Fill out post-flight report and submit to UAS Manager within 24 hours
3. Conduct preliminary QA/QC of imagery or point cloud
4. Tag files using standard naming convention and folder structure

6. SAFETY & COMPLIANCE

- All pilots must carry their FAA Remote Pilot Certificate and UAV registration.
- No flights are permitted over people or moving vehicles unless covered by FAA waiver.
- Follow the FAA's Small UAS Rule (Part 107), including:
 - Max altitude: 400 feet AGL
 - Daylight-only operations unless under waiver
 - No operations in Class B/C/D/E airspace without authorization

7. DATA PROCESSING & INTEGRATION

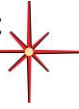
- Data will be processed using standard workflows:
 - **LiDAR:** Geo-referenced point clouds (LAS format), ground classification, DTM/DSM
 - **Imagery:** Orthophoto mosaics (GeoTIFF), 3D models (OBJ), contour lines (DWG)
- Final products are reviewed by CAD Manager and Project Manager before delivery to client
- All deliverables must be stored under the correct project folder in ShareFile with proper metadata

8. MAINTENANCE & LOGGING

- UAV maintenance is tracked in the UAV Equipment Log (maintained by UAS Manager)
- Battery cycles, sensor calibration, and firmware updates logged monthly
- Flight logs must be retained for 12 months minimum and made available for audit

9. TRAINING

- All UAV operators must complete internal UAV Operations Training annually
- Corporate will conduct quarterly UAV update briefings for all certified operators
- New hires interested in UAV ops must be approved by the UAS Manager and trained before flying



10. EMERGENCIES & INCIDENT REPORTING

- Any crash, flyaway, or injury must be reported immediately to:
 - Office PLS
 - UAS Manager
 - Corporate Safety Officer
- FAA incident reporting will be handled by UAS Manager when required

11. REFERENCES

- SCLLR Unmanned Aerial Vehicles (UAV) Policy
https://llr.sc.gov/eng/PDF_Files/UAV_Policy_2017.pdf
- H&M Surveying Training
- H&M Maintenance log