

Stockpile Mapping SOP

Texas Drone Company · DJI Mavic 3E · v1.0

Section 1 — Pre-flight prep

SD card, site check & connectivity

1. Format SD card or verify storage. Stockpile crosshatch = two full mapping passes — roughly 2x the images of a standard map. Plan storage accordingly.
2. Note the approximate height of the tallest pile on site. Flight altitude is 200 ft AGL (above ground). Confirm adequate clearance above pile tops.
3. Turn on hotspot for RTK before opening DJI app. Leave hotspot menu open.
4. Confirm with site contact that all loaders and equipment will remain clear of the flight area for the duration of both passes.

“ Active loaders or equipment moving material during the mission — even between Pass 1 and Pass 2 — will corrupt your volume data. All piles must

remain static throughout both crosshatch passes.

Camera settings

Setting	Value
Photo format	JPEG
Dewarping	OFF — must be disabled
Camera mode	Auto

“ Confirm dewarping is OFF before every mapping mission.

Section 2 — Map creation in DJI

1. Library → "+" → Area Route.
2. Draw boundary around all stockpiles. Push boundary past the base of the outermost piles.
Partial pile capture = unusable volume data.
3. Tap checkmark → select aircraft → configure parameters (see Section 3).
4. Crosshatch setup: duplicate the completed map, change course angle by exactly 90°. This becomes Pass 2. You will fly both maps as separate missions.

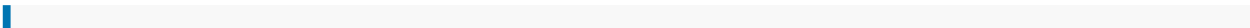
Crosshatch is not optional for stockpile mapping. A single-direction pass will miss the sides of piles and produce inaccurate or unusable volume measurements.

Section 3 — Flight parameters

Parameter	Value
Altitude	200 ft AGL
Front overlap	80% (same flight line)
Side overlap	70% (between lines)
Speed (normal)	30-33 mph
Speed (low light)	20-25 mph (shutter < 1/500s)
Photo mode	Timed interval — always

Crosshatch — required

- **Pass 1:** fly at your chosen course angle — 80% front / 70% side overlap, 200 ft AGL, timed interval mode.
- **Pass 2:** load the duplicate map with course angle rotated 90°. Same parameters as Pass 1. The two passes create a perpendicular grid pattern.
- ☐ Crosshatch captures the sides of piles that a single-direction pass misses — essential for accurate volumetrics.
- ☐ Critical for piles stored in bins or containers.
- ☐ Single-pass only is never acceptable for stockpile volume measurement deliverables.



Lower altitude (200 ft vs 300–400 ft for standard mapping) means shorter battery range per pass. Count your batteries before the job — you need enough for both full crosshatch passes.

Section 4 — RTK setup

“ Do not launch until RTK confirms "RTK data in use" and std dev has settled. RTK positional accuracy is especially critical for stockpile volume calculations.

1. Confirm controller is connected to hotspot with internet. Leave hotspot menu open.
2. Open the RTK tab in DJI. Enable "RTK Positioning" and "Maintain positioning accuracy mode" — both sliders ON.
3. Select mount point: choose the closest RTKUSA base station. Reference: rtkusa.com.
4. Watch the standard deviation drop toward 0. Wait for it to settle.
5. Confirm status reads: **"RTK Connected. RTK data in use."**
6. Verify satellite count is adequate before launching.

Section 5 — Launch & in-flight

Pass 1

1. Take off manually. Fly to start point by hand. Climb to 200 ft — clear of all pile heights — before pressing play.
2. Monitor telemetry: battery %, signal strength, RTK status.
3. Plan battery swaps before 30%. For battery swap procedures, refer to Section 5.
4. After Pass 1 lands, do not touch any piles. Swap batteries and prepare Pass 2.

Pass 2 (crosshatch)

1. Load the 90° rotated duplicate map.
2. Confirm RTK is still active and status shows "RTK data in use."
3. Take off manually, fly to start point, climb to 200 ft, press play.
4. After Pass 2 lands, verify both image counts match expected totals before packing up.

“ Do not allow any equipment to move material between Pass 1 and Pass 2. Both passes must represent the same pile state to produce valid volumetric outputs.

Section 6 — Deliverables & file naming

File naming convention

YYYY_MM_DD - Client Name - Job Site

e.g. 2025_08_03 - Vulcan Materials - Lewisville Quarry

Deliverable summary

Deliverable	Format
Unprocessed imagery — Pass 1 and Pass 2	Full resolution
QGIS data check	No gaps · RTK confirmed

Pre-handoff checklist

- ☐ Both crosshatch passes completed — image counts match expected for each.
- ☐ No equipment movement between Pass 1 and Pass 2.
- ☐ RTK confirmed active for both passes.
- ☐ All piles captured — boundary extended past base of outermost piles.
- ☐ QGIS verification complete — no gaps in coverage, RTK positioning confirmed throughout both passes.
- ☐ Coverage reviewed — full base of every pile is captured.
- ☐ Volume measurements verified per pile.
- ☐ Files named: YYYY_MM_DD - Client Name - Job Site.
- ☐ Data backed up before leaving site.
- ☐ Do not deliver without verifying in QGIS — no gaps in coverage, RTK confirmed throughout both passes.

“ Questions on site? Call your lead pilot before improvising. A quick call is faster than a re-fly.

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