

Verification & Receipts Method

Before/after evidence pattern and what counts as “fixed.”

Define evidence once. Reuse it everywhere.

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1. Purpose

What this is

This method defines the **before/after evidence pattern** used to verify outcomes and decide whether an issue is **fixed**. It standardizes what counts as acceptable proof so teams can move from subjective interpretation to repeatable commissioning decisions.

2. Definitions

Term	Meaning
Receipt	A documented evidence artifact supporting a specific claim (e.g., “Pocket P-03 removed”)
Before/After pair	Matched measurements under comparable operating conditions, collected with the same protocol
Comparable conditions	Same (or explicitly controlled) cycle window(s): lights, irrigation, dehumidification, HVAC mode
Pocket signature	Repeatable spatial/temporal pattern (RH/Temp/VPD) that indicates localized risk
Fixed	The signature no longer appears (or is reduced below threshold) and the result is repeatable

3. Evidence Pattern (Receipt Stack)

Core pattern

A verification claim is valid only when supported by the complete receipt stack:

1. **Before:** baseline evidence showing the signature.
2. **Change log:** what changed, when, where, settings, and intent.
3. **After:** evidence collected with the same protocol under comparable conditions.
4. **Delta proof:** explicit before/after comparisons showing the signature is removed or reduced.
5. **Repeatability:** confirmation across $[N]$ cycles or runs that the result persists.

Anti-pattern

If the “after” looks better but conditions were not comparable, or the protocol changed, the result is **non-verifiable**. Treat it as an observation, not proof.

4. What Counts as “Fixed”

4.1 Pass conditions

Condition	Pass requirement
C-01: Signature removal	The pocket signature does not recur in the agreed trigger window(s)
C-02: Threshold compliance	Metrics are below defined thresholds [RH / VPD / recovery time / variance]
C-03: Comparable conditions	Before/after collected under comparable modes (or differences fully documented)
C-04: Protocol consistency	Same route, heights, sampling density, and sensor placement rules
C-05: Repeatability	Result holds across [N of M] cycles/runs, not a single lucky window
C-06: Traceability	Every intervention relevant to the outcome is logged (no silent changes)

4.2 Fail conditions (not fixed)

- The pocket signature disappears once but returns on the next comparable cycle.
- The “after” data was collected in a different operating mode without explicit documentation.
- The protocol changed (route/height/density) between before and after.
- The change log is incomplete (cannot link outcomes to interventions).
- “Wall sensors improved” but canopy evidence still shows localized pockets.

5. Receipt Templates (Copy/Paste)

5.1 Receipt cover sheet

Claim (what changed):	[e.g., Pocket P-03 eliminated during post-irrigation window]
Location / Pocket ID:	[Pocket ID + coordinates / zone]
Trigger window(s):	[lights ramp / post-irrigation / dehu recovery / HVAC transition]
Thresholds used:	[e.g., RH \downarrow X% for \geq Y min; recovery \downarrow Z min]
Before artifact(s):	[Map IDs / plots / file refs]
Intervention log entry:	[Change log ref + timestamp]
After artifact(s):	[Map IDs / plots / file refs]
Delta proof:	[Overlay/delta plot ref]
Repeatability evidence:	[N of M cycles; variance report]
Reviewer / date:	[Name / Date]

5.2 Intervention log line item (minimum fields)

Field	Required content
Timestamp	<i>[YYYY-MM-DD HH:MM]</i>
What changed	<i>[equipment move / setpoint change / airflow adjustment]</i>
Where	<i>[coordinates / zone / diagram ref]</i>
Settings	<i>[fan speed / dehu stage / HVAC mode]</i>
Intent	<i>[why this change should affect the signature]</i>
Owner	<i>[who made the change]</i>

6. Common Verification Modes

6.1 Mode mapping

Mode	When to use	Primary evidence
V-01: Pocket removal	When the goal is “pockets gone”	Before/after maps + delta proof + repeatability
V-02: Recovery improvement	When the goal is faster stabilization after events	Cycle-aligned time series + recovery metric plots
V-03: Zone stability	When the goal is uniformity across canopy zones	Spatial variance + repeatability score
V-04: Control strategy validation	When the goal is “setpoints work in the real canopy”	Before/after under comparable cycles + thresholds

7. Minimum Evidence Bundle (Go/No-Go)

Required for a go-live claim

At minimum, a “fixed” decision should ship with:

- Before map(s) + cycle overlays showing the signature
- Intervention change log (timestamped, complete)
- After map(s) + cycle overlays under comparable conditions
- Delta proof (explicit before/after comparison)
- Repeatability confirmation across $[N]$ cycles/runs

8. Appendix (Optional)

8.1 Threshold worksheet (fill-in)

Metric	Threshold	Rationale / notes
Pocket RH threshold	[X%]	[risk tolerance / historical loss]
Pocket VPD threshold	[X]	[plant stress tolerance]
Recovery time threshold	[Y min]	[cycle constraints]
Zone variance threshold	[Z]	[uniformity requirement]
Repeatability requirement	[N of M]	[confidence requirement]

8.2 Change log

Version	Date	Notes
v1.0.0	January 19, 2026	Initial method template (aligned styling; watermark + header/footer metadata)