A LEAN & TAKT PRODUCTION SYSTEM APPROACH — THE QUICK READ

# Optimization & Recovery at a Glance

*Building flow, holding flow, and pulling it back when it breaks — condensed to the rules, the moves, and the checklists.*

**THE ONE IDEA**

You optimize and recover a project by fixing the production system that creates the schedule — not by typing more aggressive dates or piling more work into the field. You will never have productivity above the stability of the jobsite. Stabilize first, then flow, then accelerate. Flow beats push. Every time.

## The Six Foundations — In Strict Order

*The first three are prerequisites, not options. No recovery has ever succeeded without them in place first.*

1. **Respect for people** — pissed-off people will not help you recover this job. Fix bathrooms and break areas before you touch the schedule; start huddles tomorrow morning.
2. **Stability** — clean, safe, organized. If the site is a mess, declare a reset day and run 6S as a crew event. Hold the line when corporate says “no time to clean.”
3. **One-process flow** — plan it, build it, inspect it, finish it. Get good at finishing, not starting.
4. **Flow** — sequence crews through the building on Takt time (or at least pull). Never push one contractor on top of another.
5. **Visual systems** — huddle boards, a visual production plan to the finish, wayfinding. Flow you cannot see is flow you cannot hold.
6. **Continuous improvement** — implement first, then refine. Improvement compounds only on top of a stable system.

## The Takt Rules of Flow

*A project in a downward spiral has almost always broken several of these. Post them on the trailer wall, mark every violation in red — the red marks are your restoration list.*

### ALWAYS

- Maintain diagonal trade flow in a time-by-location format; run trades as a train — same speed, right distance apart
- Work in one-process flow; pre-kit work before it begins — only start what can be finished
- Use buffers; keep a workable backlog for swing capacity; align WIP to capacity
- Analyze the Path of Critical Flow — activity, duration, logic tie, sequence, line of balance, and buffer
- Flow by fixing problems — not by pushing trades to work faster

### NEVER

- Trade stack or trade burden — never expect a trade in two places at once
- Irresponsibly dissolve logic ties — use real data and adjust them instead
- Shorten durations without permission — shorten the in-zone cycle time through design, prefab, delivery, logistics, and prep
- Fix and freeze the plan to a baseline, or push trades faster to make up time

### The Production Science in One Box

**LITTLE'S LAW — CYCLE TIME = WIP ÷ THROUGHPUT**

If throughput is capped by a bottleneck, releasing more WIP does not make work finish faster — it makes every item take longer. On a troubled job, the reflex "we're late, release more work" is exactly the move that makes the schedule slower. Adding people fails the same way: more cars in front of the one-lane bridge.

The schedule compresses only when the production rate actually rises and cycle time drops — find the bottleneck, and change the system around it.

### The Optimization Loop — Run It Weekly

1. **Define** the production system — name the unit of completed work and the zones
2. **Map** the flow — the time-by-location plan with crew sizes, rates, and cycle times
3. **Analyze** — find where it chokes: the bottleneck, the queues, the over-utilized resource
4. **Configure** — pull a lever: reduce WIP, add capacity only at the bottleneck, shrink batches/zones, decouple shared resources, cut waiting, adjust the calendar, trim staffing in non-bottleneck areas
5. **Control** during execution — the Rules of Flow, weekly work plans, and buffer management hold the line
6. **Improve** — capture the lesson and run the loop again; optimization is never finished

**THE DISCIPLINE**

Do not assume which lever is the answer. A troubled project almost always skipped straight to Configure — adding people, pushing work — without ever defining, mapping, or analyzing. That is guessing. Model the flow, find the real constraint, change only what the model says to change.

## Recovery — The First 48 Hours

*A controlled landing beats a crash landing every time. The early moves are in order for a reason — especially the cleanup.*

- ☐ Name one accountable leader — and get help early; be productively paranoid, work through the existing team
- ☐ Walk the entire site; fix bathrooms, break areas, and respectful communication first
- ☐ Redraw the org chart by geography, not scope — single owner per area, no duplicate assignments
- ☐ Start morning worker huddles, afternoon foreman huddles, and a daily PM huddle
- ☐ Clean and organize for two full days — 6S the whole site; do not skip or reorder this one
- ☐ Switch to zero-tolerance safety — PPE, permits, fall protection at 100%
- ☐ Build one path to finish — P6, Takt plan, short-interval plan, and milestones all match, never a faked end date
- ☐ Map commissioning in a precedence diagram — then detail it again
- ☐ Target the hot zones with your best people; define "winning" daily; maintain conquered territory
- ☐ Fanatically track roadblocks — what do you need to make this go, every day

**HOLD THE LINE**

Do not push crews on top of each other. Do not do out-of-sequence work. Do not skip quality. Do not work people 17-hour days. When corporate demands a panic, say it plainly: we will finish sooner this way than by panicking — then prove it by landing the plane.

### Diagnose the Constraint Before You Fix

*Jumping straight to a fix is the "skip to Configure" error. Walk the work, name the constraint type, then pick the matching strategy.*

- **Resource constraints** — lack of preparation, varying trade speeds, improper Takt time, wrong sequence, missing resource, missing buffers
- **Zone constraints** — wrong number of zones, unplanned physical constraints, a misshaped or overly complex zone
- **Systemic & behavioral** — overburden, too much WIP, rushing-pushing-panicking, broken Rules of Flow, fear of a court case

## The 12 Ways to Recover with Takt

*One rule runs through all twelve: protect your trades. Sequence the moves cheapest-first (buffers, sequence, isolation) and most disruptive last (added crews, design changes). Re-measure between moves.*

| Strategy | The move |
|---|---|
| **1. Line of Balance recovery** | Absorb the delay with buffers; swing idle crews to workable backlog. Never stack or burden successors. |
| **2. Sequence delay recovery** | Re-order the trades to absorb the delay — e.g., go vertical and come back for the slab-on-grade. |
| **3. Isolation delay recovery** | Detach the delayed wagon from the train; run it on its own pull plan, Scrum board, or Takt time. |
| **4. Utilize experts** | Add a proven, onboarded A-crew — or use the swing capacity already working backlog. |
| **5. Rezoning recovery** | More zones on a tighter Takt time — e.g., nine zones at one-day Takt instead of three at three-day. |
| **6. Design to the work package** | Shorten the activity through design changes, equipment swaps, or prefab — not by rushing people. |
| **7. Remove trade bottlenecks** | The slowest hiker sets the pace. Swarm the bottleneck trade with support, full kit, and first-up logistics. |
| **8. Remove zone bottlenecks** | Fix the complex zone — size, access, layout, lighting, visuals — so you don't spend buffers on it. |
| **9. Phase sequencing** | Break up batched durations; run all phases the same direction so transitions work in time and space. |
| **10. Overall sequencing** | Never march 1-2-3-4-5 past a constraint — route around it (1-2-3-4-6-7-8, then 5) to keep flow. |
| **11. Align WIP & pre-plan** | Hold steady and plan deeper: supply chain, pull plan, pre-con, Line of Balance, six-week look-ahead. |
| **12. Pull plan optimization (Velaga)** | Let each trade be its own train at its own speed — multi-train acceleration creates time and buffers. |

## When It Can’t Be Absorbed — Submitting a Delay

*A delay is only reasonable to submit once you can show you tried everything. Work the four tiers in order and document each option — used or not, and why.*

1. **Absorb with buffers** — can a phase buffer or another buffer in the sequence absorb it?
2. **Delay-handling strategies** — swing to workable backlog, wait and prepare, pull the wagon onto its own plan, recover within the wagon, swarm with swing capacity
3. **The 12 Takt strategies** — diagnose the constraint, then work the matching moves from the table above
4. **Production-system levers** — reduce WIP, add capacity only at the bottleneck, shrink batches, decouple resources, cut waiting, adjust the calendar, trim staffing

- ☐ Takt schedule current and correct — dates, sequences, buffers, Line of Balance, interdependence ties
- ☐ Impact shown in the schedule without trade stacking or burdening
- ☐ Four-tier recovery record written — one line per option, used / not used / why not
- ☐ TIA built — summary, full schedule, impact window, mitigations attempted, Path of Critical Flow analysis, time and cost requested
- ☐ Path of Critical Flow verified — dependence, Line of Balance (Realized Flow Potential 45–100%), base sequences, and surplus buffers removed
- ☐ Document toward a court case, never freeze for fear of one — a well-kept Takt plan is the most defensible story you can tell

***Flow beats push. Stabilize first. Finish what you start.***