

Lean Construction

What is Lean Construction?

Lean construction is an adaptation of the lean manufacturing model that seeks to leverage careful operational research and practical design development to improve the project production process.

What makes lean construction different:

- Decentralization** Empowering PMs, subtrades, and workers
- Performance** Maximize project value, minimize waste
- Controls** Task completion, incident aversion, etc
- Delivery** On-time, at-cost project completion
- Value** To GCs, owners, suppliers, subs, etc

Why is it Important?

90% of construction projects are not completed on-time

61% of contractors report frequent delays on their projects

0.5% of data collected by construction firms is being effectively utilized

\$13.6M the cost savings across 15 projects that implemented lean construction principles

How to Implement Lean Principles

1 Identify Customer Value

What are the most important metrics to the project owner?

- Budget
- Timeline
- Quality
- Health & Safety
- Technology Deployment
- Minimizing Environmental Impact
- Innovation
- Guarantees
- Value-for-Money
- Reliability

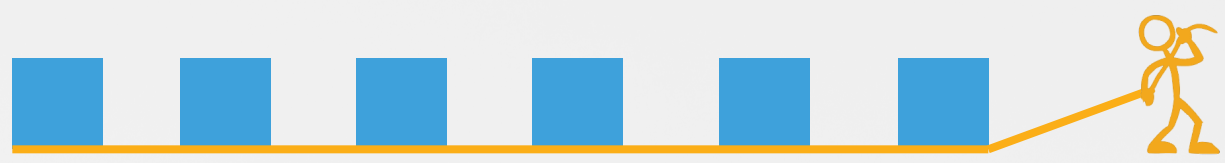
3 Map Flow-of-Work Processes

Create all process diagrams needed to achieve a continuous (waste-free) project flow.

- Bids, RFIs, & Change Orders** Create standardized manual/digital forms for daily use
- Equipment Maintenance** Build an inspection checklist to be completed after use
- Planning & Scheduling** Use a pull-style workback schedule to map projects
- Worksite Tasks** Create process diagrams for frequent and repeatable tasks

4 Implement Pull Planning

Map each stage of your project backwards from a timely completion.



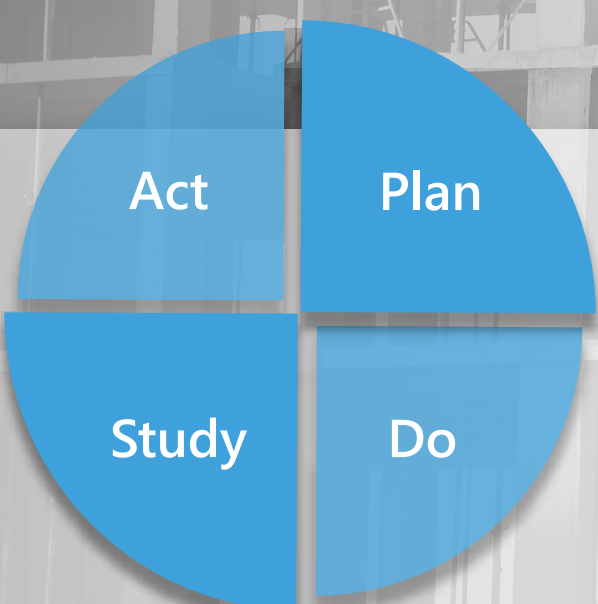
Implement pull planning by:

1. Involving the entire team (including subtrades) in the planning process
2. Identifying milestones for each stage of the project sequence
3. Mapping all milestones backwards through your overall schedule
4. Estimating durations for each activity under each milestone
5. Create weekly plans from the estimated durations of activities
6. Mandate morning meetings to outline daily activities
7. Set weekly review meetings to monitor activity progress
8. Continuously update and revise your project plan

5 Continuous Improvement

Iterate, improve, and optimize all new processes.

Goal: increase labour productivity, enhance quality of output, improve operational safety, improve project timelines and reduce operational costs.



- Plan:** Aggregate data from PM system, accounting records, etc. Use this data to reflect on performance of new processes.
- Do:** Develop new countermeasures or processes for failing workflows by repeating the previous four steps of the lean workflow.
- Study:** Monitor new performance and benchmark against previous processes to determine if it warrants permanent change.
- Act:** Establish successful improvements as new operational standards and never forget to celebrate your wins!

2 Pinpoint Problem Processes

Identify internal processes that will achieve client-perceived value.

Audit your project operations to determine which of the following sources of waste are effecting your productivity and efficiency.

Defects

In other words, rework. The result of **inferior construction coordination, poor quality safety training, inefficient supply chain management, and inaccurate documentation.**

Overproduction

Overproduction in construction is the product of **ineffective scheduling and sequencing of materials, equipment, and labor.**

Waiting

Any time that **construction workers are left idle on a site, leading to inflated labour expenditure** for tasks completed.

Non-Utilized Talent

Wasted talent resulting from **excessively firm organizational hierarchies and limited training opportunities for top performers.**

Transport

When materials don't arrive on-time due to **poor project planning, communication breakdowns, failure to properly document shipments, and/or no staging site/space.**

Inventory

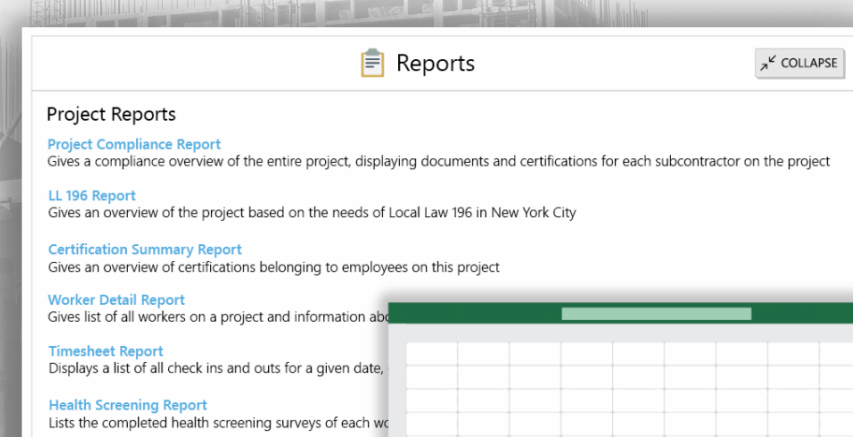
Waste in the form of stockpiled materials/supplies or unused materials/supplies. **This is caused by over-estimating, over-ordering, or the untimely procurement of inventory.**

Motion

The excess movement of workers or materials in the construction process. It is estimated that 70% of the average craftsman's time is spent on motion-related activities, with 30% of it being completely idle time.

Excess Processing

Waste created by the other seven sources of waste. In other words, all **double handling, over-communication, re-communication, and additional quality assurance checks/inspections** resulting from re-processing activities, triggered by waste activities.



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