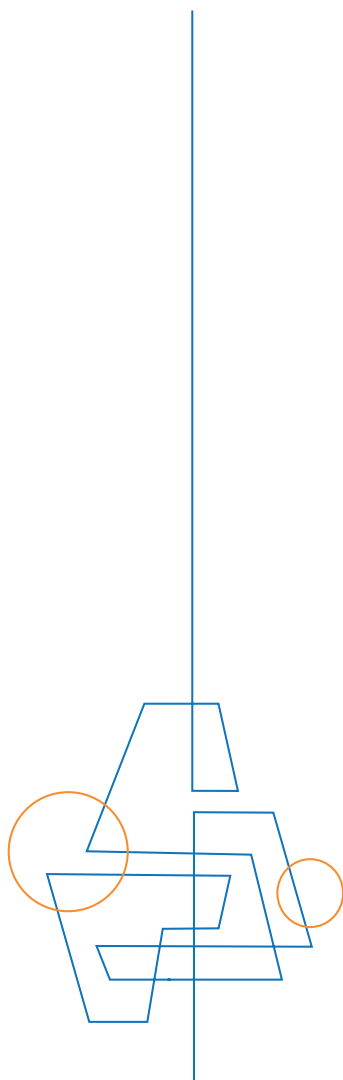




# Develop Your Offsite Construction Strategy

## Workbook



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# Introduction

Congratulations! By downloading this guide, you are taking the first step toward improving the way your organization procures and design/builds buildings. This change in thinking around how buildings are delivered will take time. After all, the construction industry has changed very little in the past 100 years. In this guide, we've done our best to equip you with the research, tools, actions and templates to move your organization forward with an offsite construction strategy.

Prior to engaging with this guide, we assume you have felt the pain of one or more of your capital projects coming in over budget, finishing late and/or with sub-par quality. You are not alone. The construction industry is fragmented and does not work in the best interest of owners and yet, it continues. A common comparison when explaining the difference between prefabrication versus traditional construction is to imagine buying a car the way we procure buildings. What comes to mind? Chaos? Now, imagine buying a building the way you would buy a car. Straightforward? Understand precisely what you are getting?

The good news is, the time to start your prefabrication strategy is before you have a project. With a prefabrication strategy defined, all projects going forward can be viewed with a new level of understanding for taking advantage of prefabricated components and buildings.

Good luck developing your offsite construction strategy. If at any time you have questions, visit our website at <https://info.clarkpacific.com/workbookdownload> to find the latest research and education tools.



*"One of the most important actions, things a leader can do, is to lead by example. If you want everyone else to be passionate, committed, dedicated, and motivated, you go first!"*

– Marshall Goldsmith

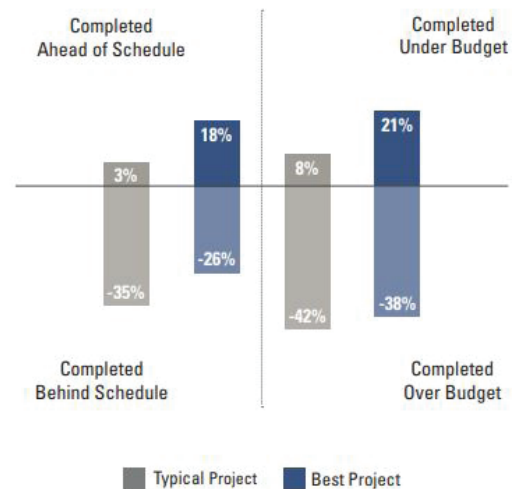
## The Research

The following research and information will help arm you with information on why an offsite construction strategy should be developed.

*Note: the industry often interchanges the terms prefabrication and offsite construction.*

The Lean Construction Institute conducted a study identifying owners Best or Typical Projects versus Schedule and Budget performance (what owners cited as most valuable to them). They found that Typical projects were 35% of the time behind schedule and 42% of the time over budget and still Best projects were 26% of the time behind schedule and 38% over budget.

**% of Projects Achieving Outcome  
(Performance from initial involvement of architect)**



LCI October 2018

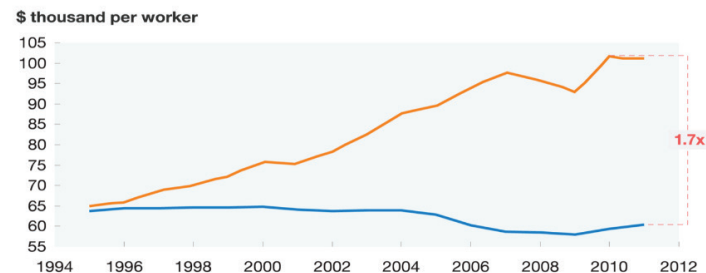
## Why are projects always late and over-budget?

Several reasons can be attributed to the industry's inefficiency:

1. Stagnant or declining productivity in the construction industry. Most have seen the below graph from McKinsey & Company comparing productivity in the manufacturing and construction industries. One of the benefits of prefabrication is that it tackles the productivity gap by manufacturing a part or the entire building.
2. Taking a different approach to why this is the case, Faithful + Gould conducted a study and found that in the field "time on tools" was only 49% of their average day. The other 51% was time spent on safety talks, locating tools, moving around the job site and coordinating amongst the trades.

**Overview of productivity improvement over time**

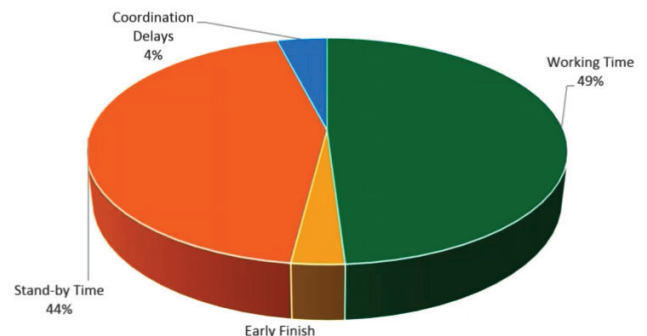
Productivity (value added per worker), real, \$ 2005



Source: Expert interviews; IHS Global Insight (Belgium, France, Germany, Italy, Spain, United Kingdom, United States); World Input-Output Database

McKinsey&Company

**F+G Time on Tools® Construction Industry Statistics**

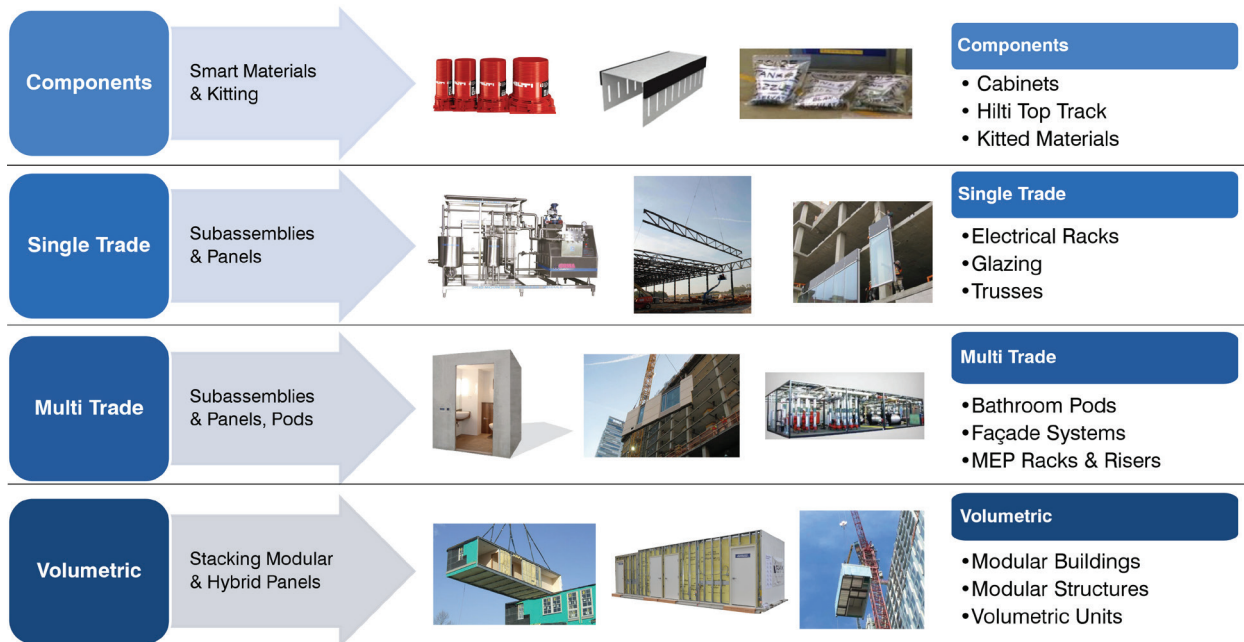


# Prefabricated Options Defined

## The Offsite Continuum

Offsite construction can incorporate many different types of materials and levels of work. It is a broad term that encompasses the creation of **building elements** in a **controlled environment** that are then transported to their destination and preferably installed onsite using **accelerated assembly** methods.

### The Offsite Continuum





## Debunking the Myths

In order to handle the many questions you will receive about offsite construction, it is important to understand the myths around prefabrication.

Myth	Reality
Prefabricated systems require that more decisions are made.	More decisions are not being made, they are just made earlier in the process. A commitment to the design work needs to happen at an early stage so that the manufacturing lines can be engineered and set up. Early engagement, whether during predesign or schematic design, is critical to gain the cost benefits of prefabrication.
Prefabricated systems limit design and are one dimensional, plain, cannot be aesthetically pleasing, or customized to carry out the architect's vision.	Prefabricated systems have come a long way and offer high-quality finishes, aesthetic versatility and most importantly, design flexibility. By working with a prefabricator that has a great deal of experience collaborating with design teams and making their visions a reality, you can achieve the project goal with a prefabricated system.
Low quality puts projects at risk because buildings constructed with prefabricated systems are not created with the same level of quality as traditional buildings.	This concern shows that there is a lack of education about the realities and benefits of prefabrication. Since one of the main benefits of offsite construction is the ability to produce higher quality work under controlled conditions.
Because prefabricated systems require that components be transported to the job site, using them is more expensive.	While there are transportation costs, prefabrication results in shortened construction time, predictable timelines, lower labor costs and more efficient jobsites – all of which offset the cost of transportation and can significantly reduce costs over traditional construction methods.

## Business Benefits

One way to the heart of matters is through the bottom line.

Short Term Benefits	Long Term Benefits
<ul style="list-style-type: none"><li>• Less congested site, less manpower to manage on-site</li><li>• Safer construction site</li><li>• Cost certainty</li><li>• Schedule certainty, potentially shorter schedule</li><li>• Reduced site disruption</li><li>• Best-in-class quality</li><li>• Shortened time to occupancy</li></ul>	<ul style="list-style-type: none"><li>• Building more with less resources</li><li>• Cross-project learning equals a shorter learning loop</li><li>• "Standing on the shoulders" of proven designs</li><li>• Continuous improvement due to decoupled elements</li><li>• Ability to tap into a larger, global supply chain</li><li>• Investments today reap future returns</li></ul>

# Step 1: Gather internal support and industry insights

## ACTION ITEM

Build your internal team, organize the group, and learn more about prefabrication.

Who can you engage within each business that impacts the procurement and/or delivery of your buildings?

- Look to incorporate individuals from: Procurement, Construction, Facilities, Finance, Users, Legal and Management/Executives
- Schedule an initial meeting with like-minded individuals in your organization.

Name	Department

Questions to ask yourself and the group:

- How can we integrate business and project teams more effectively across the entire organization?
- How can we plan for projects in a more interdisciplinary way that allows for systems thinking and integrated design?
- How can we work with suppliers and service providers to quantify the value that offsite construction offers, looking beyond just the project level or initial capital costs to the whole asset life cycle costs?
- What skills and capabilities (internally and externally) will we need in the future to plan for and execute capital projects?
- How can we adapt contracting methods to accommodate more collaborative partnerships and investments in offsite construction projects?
- How do we connect people, technology, and business values more effectively?

<sup>1</sup> From FMI new day new mindset rethinking construction webinar presented by Jay Snyder. To watch the full webinar Click Here > <https://info.clarkpacific.com/NewDayNewMindset>

1) Find out if your company has a specific policy or procedure for establishing an internal committee. If so, use it to create your committee. If not, see Appendix 1 for a charter template.

2) Build the team and organization's knowledge of prefabrication:

- Schedule lunch and learns for the newly established prefabrication committee
  - Provide a list of prefabrication companies who offer lunch and learns
- Schedule plant tours
- Watch industry webinars
- Identify conferences to attend
  - Offsite Expo
  - Modular Construction
  - Advancing Prefabrication
  - CIFE Industrialized Construction Forum
- Report out and educate the rest of your organization on the prefabrication companies you have met with and what you have learned.

#### Partners and Vendors to Contact




# Step 2: Understand the current state

Collect information on the current state of your organization and work with departments to limit your organization's barriers to adopting prefabrication.

## Procurement and Contracts

- 1) Schedule a meeting with your procurement department to review the current state of your procurement documentation.
  - Identify any language that would limit prefabrication. If there is language that would limit your ability to leverage prefabrication, engage with the procurement team to add language to the documents or remove limiting language.
  - Some procurement policies require a three (3) bid procurement process. With prefabrication, it may be difficult to follow this policy if there are not three prefabricators that can provide bids. To address this challenge, your organization will need to establish a practice/policy/procedure to allow prefabricators and your company to agree on a 3rd party estimate the prefabricated scope of work to verify costs.
  - It is also important to recognize that project delivery methods will have a big impact on which projects you select to start your prefabrication journey. A valuable project delivery method to start with is a design-build contract with a Part A and a Part B, where the owner can disengage if the 3rd party estimate, and prefabricator cannot come to agreement at 100% DD (end of Part A).
  - Clark Pacific has preassembled language you can use to modify procurement documentation to allow for and support prefabrication going forward. We see customers have a lot of success when the project values line up with the procurement language. See Appendix 2

### ACTION ITEM

Make a list of project values that are important to your organization.

*Note: Values may vary from project to project. Start with values at the corporate level and then create a separate list of values for each project.*

Values	List Your Corporate Capital Project Values
<ul style="list-style-type: none"><li>• Budget Certainty</li><li>• Schedule Certainty</li><li>• Reduced Site Impact</li><li>• Higher Quality</li><li>• Material Availability</li><li>• Labor Shortages</li><li>• Time to Revenue</li></ul>	

- 2) Schedule a meeting with your legal team to review the current state of your contract templates. Look for any language that would limit prefabrication. If there is language that would limit your organization's ability to leverage prefabrication engage with your legal team to find ways to incorporate prefabrication.

- 3) In your procurement documents and contracts, what language and terms exist that limit offsite construction?

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## Past Project Budget and Schedule Scorecard

### ACTION ITEM

Evaluate the schedule and budget of your organization's construction projects for the last 3-5 years. Meet with the appropriate internal departments to collect actual project performance.

- 1) Using the Project Scorecard (Appendix 3), list each project and calculate the differences between the initial budget and schedule to the actuals. In addition to calculating the upfront cost and time, it is important to calculate the value of lost opportunity. This is often overlooked and the largest loss for organizations. Essentially, lost opportunity costs are often the cost of not being able to take on more work each year because of project schedule delays.

- Schedule a committee meeting to report findings to the C-suite

See Appendix 3 for a Project Scorecard or download a preformatted spreadsheet from our website:

<https://info.clarkpacific.com/workbookdownload>

Information Needed for the Project Scorecard:

- List of Past Projects
- Project Type
- Initial Project Schedule (in months)
- Actual Schedule Duration (in months)
- Initial Project Budget Estimate
- Actual Project Costs
- Overhead and GCs Cost each Month

# Step 3: Identify where to begin your prefabrication journey

## ACTION ITEM

Evaluate previous projects to identify current offsite construction opportunities

- Use the Product Scorecard (Appendix 4) to list out projects from the last 3-5 years. List the project type for each and then evaluate whether one of the prefabrication strategies could have been implemented for that project.
- The total score will help identify the prefabrication solution that would have had the largest impact and the project types you can target for prefabrication moving forward.

Complete the Product Scorecard (Appendix 4) or download a preformatted spreadsheet from our website: <https://info.clarkpacific.com/workbookdownload>

Prefabricators to meet with for upcoming project(s)

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# Step 4: Develop your prefabrication strategy

## ACTION ITEM

Identify areas of prefabrication that fit your company and prioritize for future projects.

In this step, you will be combining the previously collected and analyzed information and translate it into action. The goal is to identify three major elements for your organization:

- 1. A starting point on the prefabrication continuum and a strategy to scale up from that point.
  - a. With the completed Project Scorecard, you now have insight how previous projects have performed.
  - b. Use the Product Scorecard to understand how prefabrication may have benefited previous projects.
- 2. A list of future projects that hold a high opportunity for prefabrication.
- 3. Potential partners.

List out future projects, project types and identify the level of prefabrication to start exploring. Set up a meeting with a prefabricator to understand how the project can fully take advantage of prefabrication.

Project	Type	Prefabricated Solution Identified (Refer to the Offsite Continuum)

Prefabricators to meet with regarding upcoming projects

# Summary

This guide is a starting point to help you champion prefabrication within your organization. By bringing together the right teams to affect change and developing a prefabrication strategy, you have aligned a group, outlined your organization's current state, identified opportunities and selected a path forward.

The most successful prefabrication strategies will:

- Consider prefabrication before project conception
- Engage with a prefabricator at project conception to determine the best offsite solution(s)
- Align procurement and contracts to the values of the organization and project
- Consider prefabrication a long-term strategy and learn from each project

If you have any questions on how to use this guide or use the worksheets, please contact us and we will be happy to help.

For more information, contact us today: <https://www.clarkpacific.com/contact/>

**Mission Statement**

Outline the Goals and Objectives for the Steering Committee (Below are a few examples)

- Review current state of the company's use of prefabrication
- Internally champion prefabrication
- Learn and communicate throughout the organization the methods and benefits of prefabrication
- Advise senior leadership and project decision-makers of the opportunities for prefabrication

**Membership**

The Steering Committee will consist of the following members:

Name	Role	End of Tenure

Length of a Committee Member Term:

% of Members present to constitute a quorum:

Describe how new members will be selected:

Determine one person to be the committee chairperson

**Role of a Steering Committee Member**

Individually, Steering Committee members should:  
(list the responsibilities of the committee members)

**Frequency of Meetings**

The Steering Committee will meet \_\_\_\_\_ times per month in the first year and then \_\_\_\_\_ times per month or as required to keep track of issues and the progress of the organizations adoption of prefabrication. The committee chairperson will organize and schedule the meetings.

The chairperson lead will prepare the Agenda for Steering Committee Meetings.

**Declaration of Acceptance**

Declaration of Acceptance by Steering Committee Member:

Please sign below to confirm your acceptance and creation of the Steering Committee Charter

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_



We have developed questions around each of these areas of focus for owners to use in their RFPs to help specify the need for prefabrication.

### Resilient Design

Resilience is defined as the ability of a system to recover from disruption or interruption. Whether earthquake, flood, fire, heat waves, drought, terrorism, or political strife, buildings and communities should be designed in such a way to minimize the impacts of disaster and improve the ability of systems to recover more quickly in their aftermath. This project values the principles of resilient design, specifically long-term durability and earthquake resilience.

1. What are your strategies for a resilient design?
2. How does your proposal prioritize resilience?
3. How should the level of resilience in your proposal be measured?

### Reduced Schedules

This project values speed of construction to limit disruption to campus operations.

1. What innovative opportunities will you employ to reduce overall project schedule from traditional construction durations
2. Do you plan on an innovative means and methods of construction that would reduce or create more certainty with your estimated schedule?

### Minimizing Campus Disruptions/Impacts

This project values project delivery that ensures the most efficient construction sequencing approach is employed. The project values an innovative approach that enhances project and site safety for pedestrians and workers and minimizes impacts to the community and adjacent site operations (including the number and density of workers on-site – their parking and other support needs), and delivers a completed project in the least amount of time.

1. What are your strategies to minimize impacts to the project site and adjacent community?
2. Do you have plan to reduce on-site manpower density?

3. How will you level out peak labor to reduce impacts to site?
4. What innovative strategies do you plan on using to create a safer worksite and surrounding area?

### Prefabrication

This project values off-site manufacturing and prefabricated elements and building systems as they are known to provide cost certainty, reduce project schedules, reduce impacts of construction, increase quality and enhance overall value to the owner.

1. What is your team's strategy to enable and optimize off-site construction and prefabrication for this project?
2. Do you have team members in-house or consultants on your team with experience in facilitating a process to optimize off-site elements in the program, design, procurement and construction phases?
3. Please outline your strategy for optimizing offsite and prefabrication
4. List any key partners/team members that will lead this approach

### Lifecycle Costs and Building Life Expectancy

This project values the promise of lower lifecycle costs for this project. One approach to minimizing lifecycle costs is through more durable construction materials.

1. What is your strategy to utilize durable construction materials on this project in relation to building life expectancy and costs?
2. What is your strategy to minimize downstream lifecycle costs of the project?

### Collaborative Team for Prefabricated Project Delivery

The Lean Construction Institute (among others) have identified that successful projects are more likely to have early involvement of prefabrication team members.

1. What is your strategy for early engagement of team members to maximize prefabrication on the project?

# Appendix 3

## Current Project Scorecard

You can use this table to compare which projects

[illegible]

# Appendix 4

## Product Scorecard

Refer to the offsite continuum.

[illegible]



Escondido Village Graduate Residences  
Stanford, CA



The Rockwell  
San Francisco, CA



Apple Park Office Building  
Cupertino, CA



CSU Sacramento Parking Structure 5  
Sacramento, CA

## About Clark Pacific

Clark Pacific is a leading manufacturer of prefabricated building systems. We are transforming design and construction by delivering high quality, cost effective buildings with less risk. Clark Pacific paves the way for prefabrication as a smarter, safer and more efficient way to bring great designs to life. Clark Pacific collaborates with construction owners and design-build teams to develop and deliver prefabricated building systems for commercial and institutional projects of any size and complexity.



**Build different. Achieve more.**