



BUILDING CERTAINTY

Your Pre-Construction Guide to
a Successful Modular Project





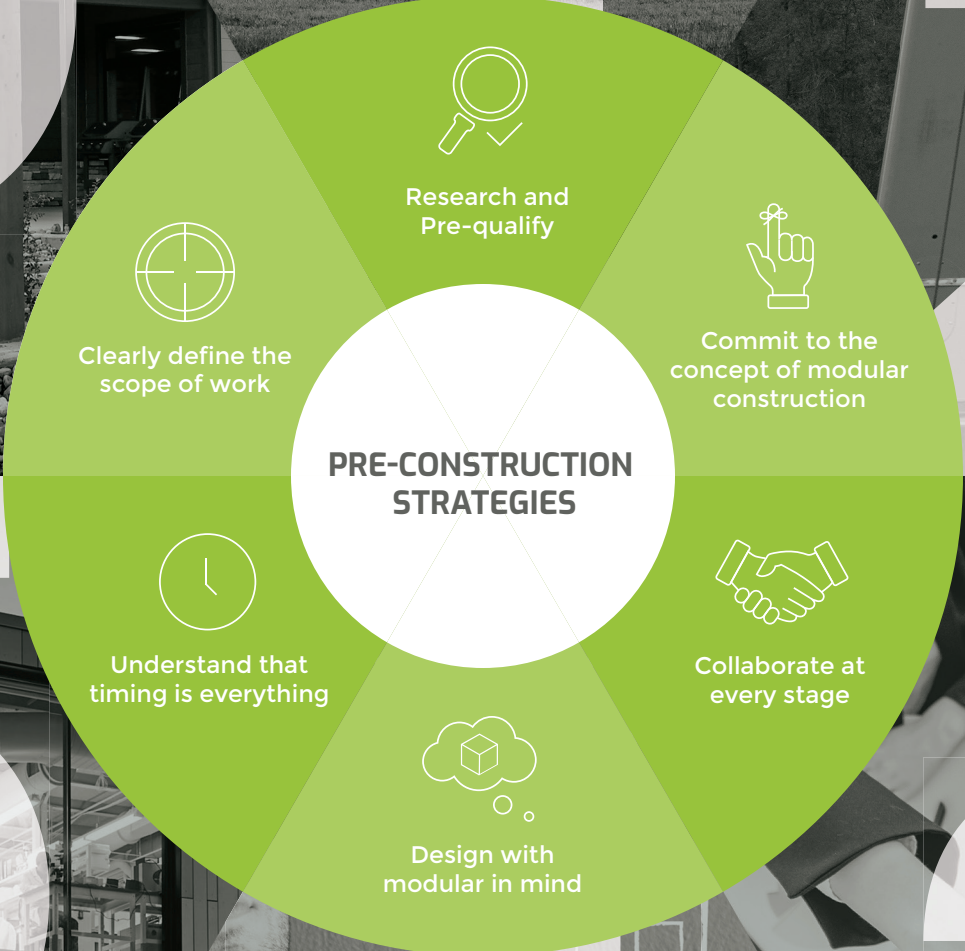
PRE-CONSTRUCTION STRATEGIES TO GET YOU STARTED

Modular Construction creates buildings with the same look, feel and performance as conventional construction. The significant benefits of the method include time savings, cost and schedule certainty, higher quality structures and less waste.

Modular has critical differences from site-built construction in its building process – particularly in the pre-construction stages. Getting the most from your modular project requires different thinking and coordination.

By understanding and implementing six pre-construction strategies, you can watch your project succeed right from day one.





PRE-CONSTRUCTION STRATEGIES

Research and Pre-qualify

Commit to the concept of modular construction

Collaborate at every stage

Design with modular in mind

Understand that timing is everything

Clearly define the scope of work



STRATEGY 1:

RESEARCH AND PRE-QUALIFY

Your pre-construction strategies should begin with gaining a good understanding of the modular building industry, including manufacturers and their expertise and capabilities. This is part of the due diligence required for any construction project, however this process can take more time and take on greater significance if you are exploring modular construction for the first time.

Your steps:

Research the industry. The modular construction industry is diverse, with an ever-increasing number of applications which include housing, offices, hotels, schools, retail outlets, and others. Find a company with the experience to meet your requirements and the correct geographical coverage for your project's location. Review case studies and ask for referrals to establish capabilities. Share that knowledge with your team so that everyone understands the possibilities.

Issue a formal request for pre-qualification. Formally pre-qualifying modular construction companies allows you to gather information on their project experience, resources and capabilities, QA/QC procedures, and project management and execution plans, along with their geographical reach, financial strength and corporate structure.

Early engagement of all stakeholders is one of the keys to success for your modular project. Finding a qualified modular building expert early and integrating them with your design team will go a long way to having everyone on the same page from the start. Your expert will bring valuable experience and insight to the planning table that can guide the process and optimize the use of modularization and off-site manufacturing.





STRATEGY 2: COMMIT TO THE CONCEPT OF MODULAR

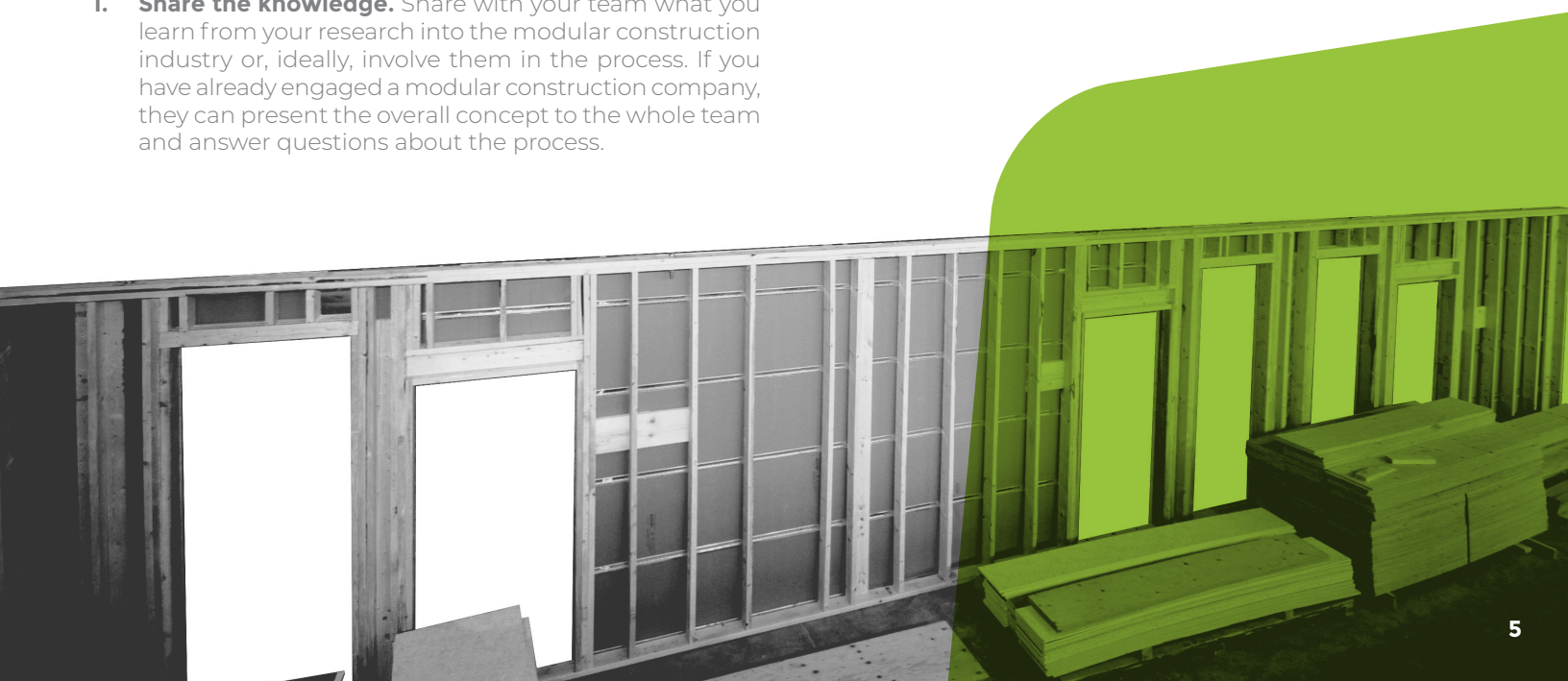
Deciding to use modular construction as your project delivery method should not be an afterthought. If you are already well down the design development path with a conventional build, choosing a modular solution at that late point will require backtracking.

Modular construction is a methodology that can achieve the overall vision, permanence and performance demanded by architects and owners. If your team keeps this in mind, no one will be constrained by their own impressions of what modular can accomplish. Instead, the project team will be open to the innovative potential of modular and will gain its benefits to the fullest as you begin designing.

Your steps:

1. Share the knowledge. Share with your team what you learn from your research into the modular construction industry or, ideally, involve them in the process. If you have already engaged a modular construction company, they can present the overall concept to the whole team and answer questions about the process.

- 2. Identify where the process differs from conventional construction.** If modular construction is unfamiliar territory, it can be good for your team to identify exactly how the terrain is likely to be different from what they are used to. Structural design, scheduling, sequencing, roles and responsibilities can all differ when building offsite, but it does not impact how the ultimate vision is achieved.
- 3. Get your team aligned.** All of your stakeholders, including owners, architects, designers, construction managers and contractors should understand and be on board with the modular approach. The alignment of your team and coordination of design are critical to the success of a modular project; achieving alignment will lead to a much more effective roll out.





STRATEGY 3:

COLLABORATE AT EVERY STAGE

You optimize your project outcome by harnessing the expertise and insights of each stakeholder, collaboratively engaging them in the process from concept and design through final occupancy. It is even more important to collaborate on a modular project, as greater emphasis is placed on early decision making, roles and responsibilities and project coordination. Bringing all stakeholders together at every stage of the pre-construction phase will ensure multiple perspectives are addressed from the many disciplines on the team so that concerns are dealt with and assumptions are clarified. The more complex or sophisticated the design, the more important teamwork becomes.

Your steps:

- 1. Invite the right people to the table.** Your team should consist of those who are involved with the project from the conceptual phase forward. That means a cross-functional team that would typically include the owner and/or their representative, the architect and design consultants, the construction manager, the modular building company and any contractors. A team reaching for LEED certification may also include a green building or energy consultant.
- 2. Appoint a champion for your collaboration.** Who should coordinate and support the team's collaboration efforts is often determined by the contract method. It could be the owner, architect or a project manager from the modular construction company.
- 3. Organize the team horizontally, not vertically.** In traditional construction projects, information often flows from the top (owner/architect) to the bottom (construction company). In modular construction, allowing all parties to communicate with each other at the same table encourages the flow of information between all members of the team. This leads to project innovation and creative problem solving.

- 4. Build trust between team members.** Trust is necessary to collaborate effectively. With trust also comes a willingness to listen to all perspectives and a confidence that each team member will deliver on their responsibilities.
- 5. Facilitate communication, coordination and cooperation.** Clearly define a scope of work for your process.
- 6. Formalize "design-assist" with a Design Services Agreement.** A modular building expert can help guide project development during the planning and design phases. This will help you meet best practices for building offsite and achieve your desired schedule and budget outcomes. A Design Services Agreement or Project Development Agreement is common to a company like Horizon North and establishes a contract with the owner or owner's representative for design assistance which can help move your project forward to your ultimate vision.





STRATEGY 4:

DESIGN WITH A MODULAR APPROACH IN MIND

Modular Construction can match site-built construction in building science, architectural design, life cycle durability, and energy efficiency. That said, there are different design elements to consider as a result of the alternative method and they must be addressed early in the design development process. The key to modular construction is in the details, so do not take shortcuts or make assumptions without understanding these specifics.

An integrated design approach is key at this stage because this is where all the disciplines converge to take care of coordination between the unique structural requirements of modular and other areas such as mechanical and electrical. The size and configuration of modules are important as they must fit site access requirements and transportation regulations. Module sizes and layouts also determine the foundation size and layout.

Your steps:

- 1. Learn best practices when applying a modular design.** Some of the overarching goals in design for modular construction include:
 - Completing construction at the modular manufacturing facility to the highest degree possible to minimize the amount of site work and activity, as well as related construction hazards.
 - Maximizing the size of the modules.
 - Minimizing the number of modules.
 - Finding the most logical and practical modular layout for optimal efficiency in cost, design, transportation, site access and foundation design.

- 2. Understand transportation and site logistics.** The dimensions of the modules used in your building design are driven primarily by transportation regulations in the region(s) of travel from the manufacturing facility to the site location. As a result, they are typically designed based on the most stringent location. Site access can also be a factor in defining module size.
- 3. Develop a modular layout.** This is the stage where your team can begin over-laying a modular plan on the owner's concept layout. This coordinated review will uncover any minor conflicts and suggest changes that, if implemented, could save time and/or money. The team can then decide if the impact of the change is acceptable. An example might be shifting a window, a door or a plumbing fixture to keep it off the preferred modular split line so it can be pre-installed in manufacturing instead of on site.
- 4. Schedule the project to build off-site and on site concurrently.** One of the primary factors in the accelerated schedule of modular construction is the ability to build the project in a controlled environment while developing the site at the same time. Taking advantage of this ability along with other benefits like less downtime during construction can shorten a schedule by as much as 50%.





STRATEGY 5:

UNDERSTAND THAT TIMING IS EVERYTHING

The accelerated construction timeline is one of the most appealing benefits of modular construction. Projects can be completed up to 50 percent faster than construction using conventional methods. Schedule efficiencies can be lost, however, if the design and construction teams do not understand the sequencing. Pay close attention to the timing required to hit key milestone dates – from initial design all the way through to site readiness. Team cooperation and communication play a significant role here.

Your steps:

- 1. Allow enough time for full design development up front.** Modular construction projects may require more upfront design work than their conventional counterparts because of the compressed schedules. Set a realistic but firm deadline for document design, submittals and approvals, and communicate that requirement to all stakeholders. Make sure everyone stays within the allotted schedules. Fabrication of the building at the manufacturing facility does not start until the design is done and approvals received.
- 2. Make early decisions and stick to them.** Decision making is often one of the most challenging aspects in the switch from site-built to modular construction methodology because it requires more team attention to detail earlier on in the process. In a conventional linear construction schedule, there is generally more time to make choices, such as fixtures, millwork or colours, or make final design changes to the building systems during construction. Ideally, this would never occur when the

building is fabricated in a modular plant. In modular, for example, your paint colour choices may be needed before your foundations are even in. While this may take more cooperation and agility in decision making, the trade off is that changes (and change orders) are minimized while costs and schedules are more readily controlled.

- 3. Freeze the modular footprint.** One of the first decisions to make will be when to freeze the footprint of your building. As you learned in Strategy 4, a modular plan is developed from the agreed layout and the structural design can then be completed. When working with non-combustible construction, for example, structural steel is always on the critical path.
- 4. Streamline your approvals process.** In order to get the most benefit from modular construction's compressed scheduling, you may need to re-align your traditional submittals process to suit the needs of your modular builder. It is common in modular for submittals to be made to the client for approval as they are required, rather than gathering them all together for one large submittal. This is necessary due to the shortened construction time; long lead items need to be pre-ordered and often they are six-week items, not 16-week items.
- 5. Plan beyond preconstruction.** While this paper explores strategies leading up to manufacturing, delivery and installation, good planning and choreography of the entire project from design to occupancy will ensure a timely, successful outcome.



STRATEGY 6:

CLEARLY DEFINE THE SCOPE OF WORK

A specification determines what products, systems and assemblies are to be used. A scope of work, however, defines who does what to complete the project. Complete your scope of work document at the pricing stage to both assign responsibilities and ensure all costs are captured.

The scope of work document can be modified through the negotiation and execution processes as agreed but should be the document that ultimately defines the roles and responsibilities of all participants. That detailed checklist can dramatically reduce any potential of scope gaps, overlaps and prevents finger pointing between stakeholders.

Your steps:

- 1. Define the role of the modular construction company.** Is there an industry standard for a scope of work? No. Instead, the delineation of responsibility for all aspects of the project should be identified and agreed to early on at the design and pricing stage. What role the modular company plays in project execution can vary depending on their preferences, resources, capabilities and the desires of your project execution team.
- 2. Build the scope of work to suit the team's agreed terms.** Identify, agree on and communicate what the modular company will do offsite and on site and what architects, engineers and any other contractors will do. This delineation should identify everything from design to final commissioning and occupancy. The scope of work becomes a checklist for all to use as a guide to finishing the project on time and on budget.

- 3. Explore hybrid construction if it makes practical sense.**

A modular project does not necessarily mean 100% of the building requirements are completed offsite. A hybrid approach between modular and site-built or panelized construction can make practical sense. A good example could be a school where the bulk of the structure including classroom wings are constructed off-site and a gymnasium or atrium is constructed with a more conventional approach to accommodate higher ceilings. When you consider the hybrid approach, the possibilities seem endless. Whatever your approach, however, the scope of work roles and responsibilities must always be clearly defined.

Experience peace of mind on your next project.

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