

# Is Wood-Frame Modular the Future of Multi-family Construction?

Architectural Design:  
What's Different and What's the Same

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Questions related to specific materials, methods, and services will addressed at the conclusion of this presentation.



# Course Description

Modular construction is touted as an opportunity to combat rising interest rates and construction prices through greater efficiency, address skilled labor shortages, and reduce jobsite waste.

However, some architects and engineers are hesitant to embrace the modular approach because they don't want their designs to be compromised, and they don't think it has the flexibility or functionality to execute certain project typologies. Presented by modular design experts from the west coast, this workshop will take a close look at modular wood-frame multi-family projects in particular. First, a Seattle-based architect will examine unique design considerations, detailing and sourcing techniques, and review the advantages and challenges of the design/delivery process. A California-based building enclosure consultant will then offer insights on the building enclosure functions of heat, air, and moisture control in wood-frame buildings, and apply these concepts to the realities of modular construction. Lastly, a structural engineer will focus on unique structural design considerations and constraints associated with modular projects, including load transfer, interfacing with manufacturers, construction sequence coordination, and third-party structural inspections.

# Learning Objectives



Highlight potential benefits associated with the use of modular construction in multi-family buildings.



Discuss unique design considerations for modular projects including room layouts, spans, fire-resistance and acoustic performance.



Determine how building enclosure functions, including heat, air and moisture control, differ for modular vs. traditional wood-frame projects.



Explore the potential for the increased use of modular approaches in wood-frame construction.

A photograph of a construction site, likely a factory or warehouse, with a blue tint. In the foreground, a worker wearing a white hard hat with a logo, safety glasses, and a high-visibility vest is working on a large wooden beam. In the background, other workers in similar gear are visible, working on more beams. The scene is industrial and well-lit.

## Modular Design: A Primer for Designers & Developers



# Modular Building Basics

02

- ✓ Kit of Parts
- ✓ Pre-Approved Boxes
- ✓ Pre-Approved Connection Details



# Can Modular Save Me Money?



Where Can Modular Add Value to My Project?

Decrease project schedule

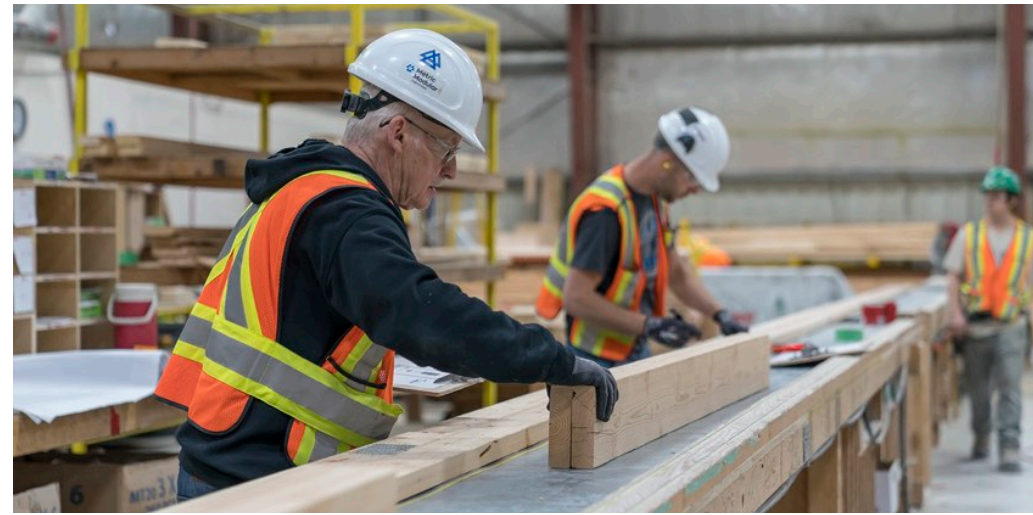
Faster time to dry-in

Controlled labor costs

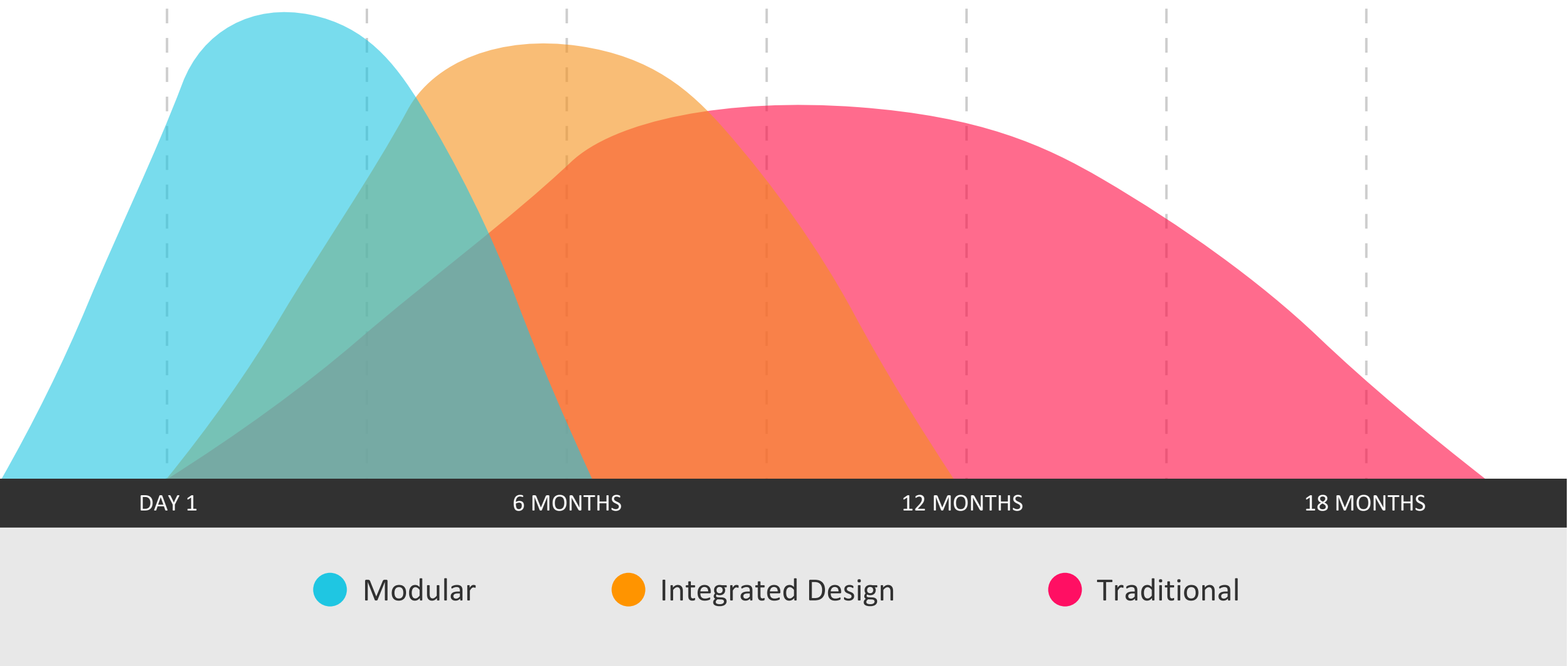
Inherent sustainability

Repeatable quality

Set day is awesome!



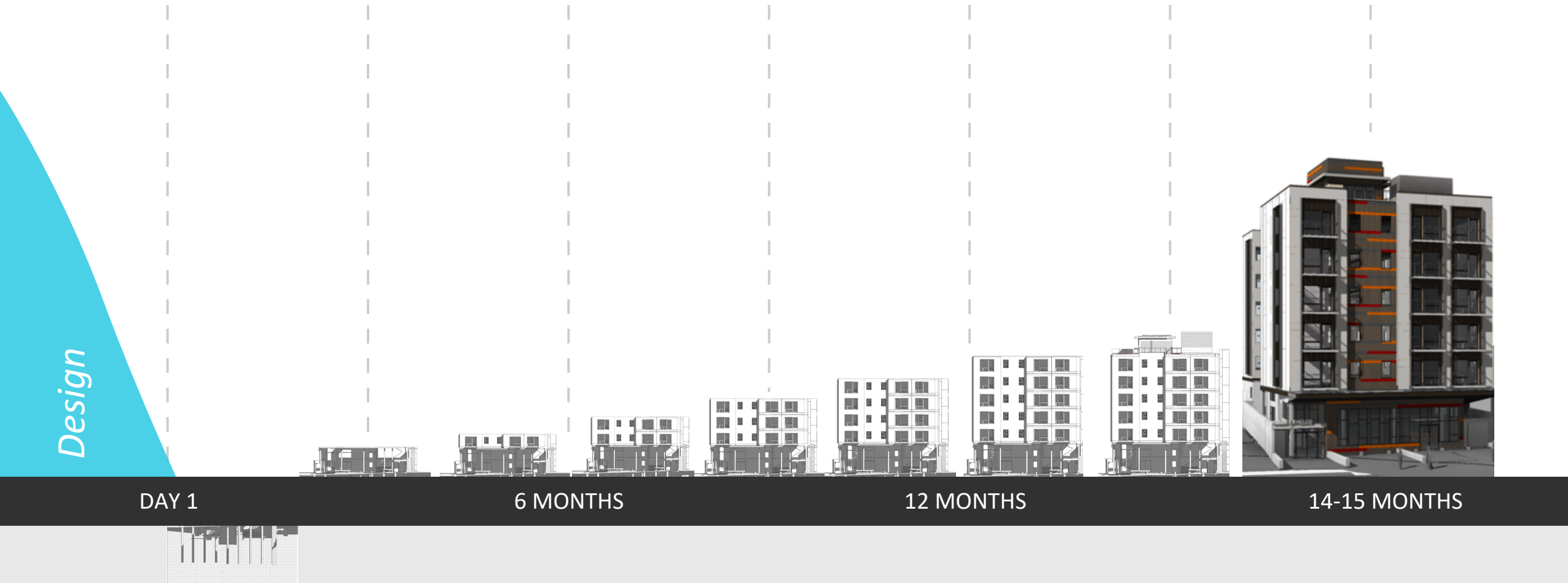
# Design Timeline





# Standard Construction

05



# Modular Construction

06

*Design*



A construction worker wearing a white hard hat, a high-visibility safety vest, and blue overalls is kneeling on a large, rectangular concrete modular unit. The worker is in a large industrial facility, likely a factory, with various construction materials and equipment visible in the background. The entire image has a blue color overlay. A white rectangular box is superimposed over the center of the image, containing the text "Modular Challenges & Opportunities".

## Modular Challenges & Opportunities

# Modular Design:

## Pain Points & Learning Curve

08

- ● In-unit matelines
- ● Connection detail coordination
- Coordinated inspections/reviews
- Multi-story MEP Shafts
- MEP coordination
- Non-jurisdiction permit timelines

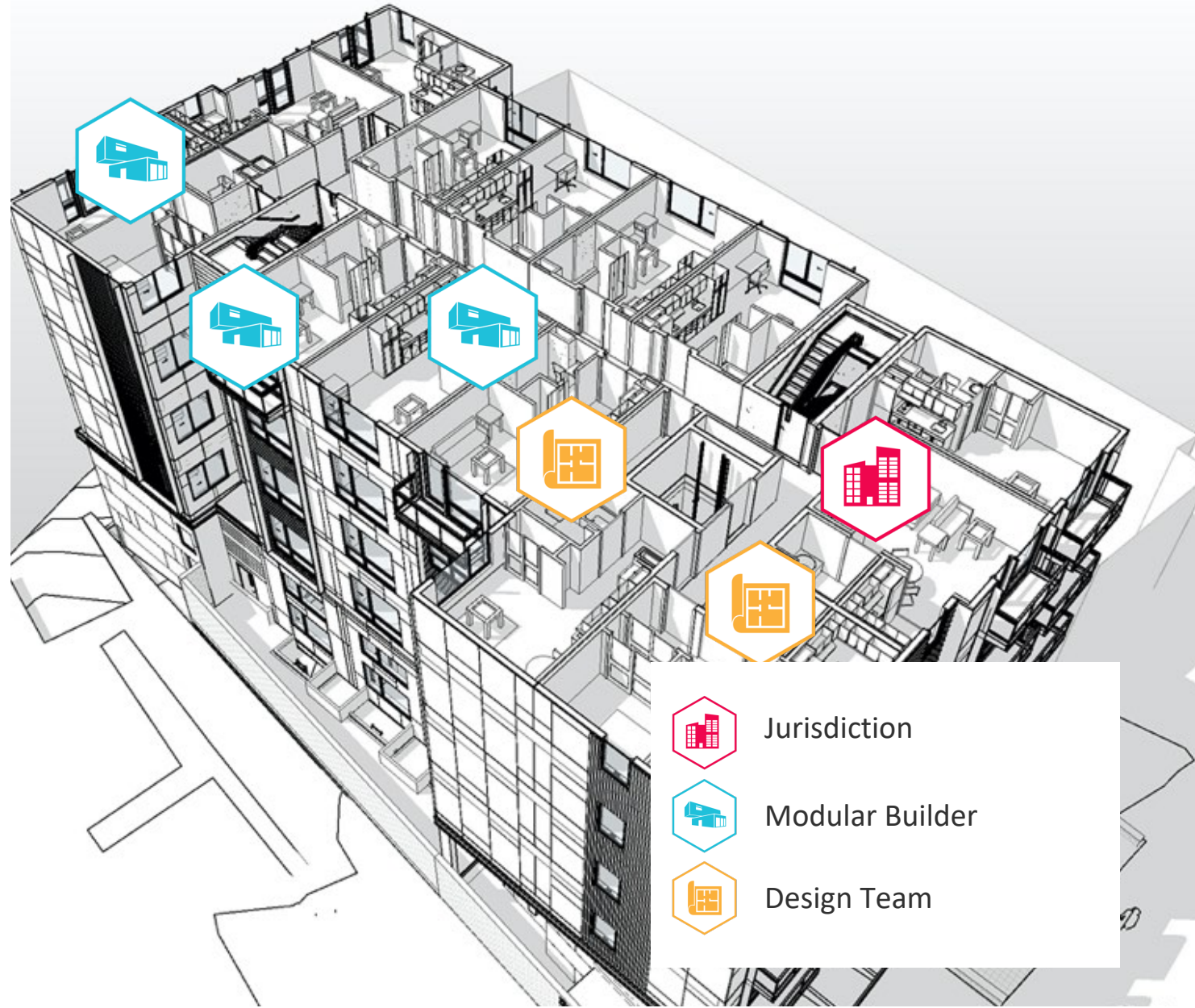




# Modular Design:

## Opportunities & Improvements

- Coordinated reviews
- Eliminate in-unit matelines
- No MEP shafts
- Simple structural system
- Bad weather set
- More factory work
- More off-site construction
- Coordinated inspections





# AHJ Coordination

*“Who gave you the “ok” to cover?”*

Clear delineation of jurisdiction

Special inspections vs. the city

Failed inspections & revisions take time

The inspections that the municipality wants to see may not even be in their system to call for



# Construction Coordination

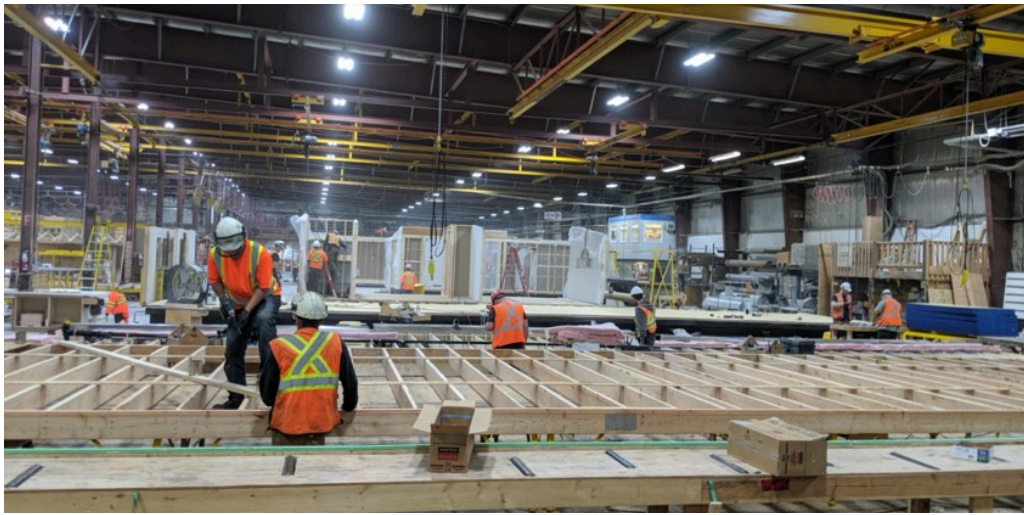
*What are the gaps we aren't seeing?*

Standard closure details

Inspector education

Municipal Coordination

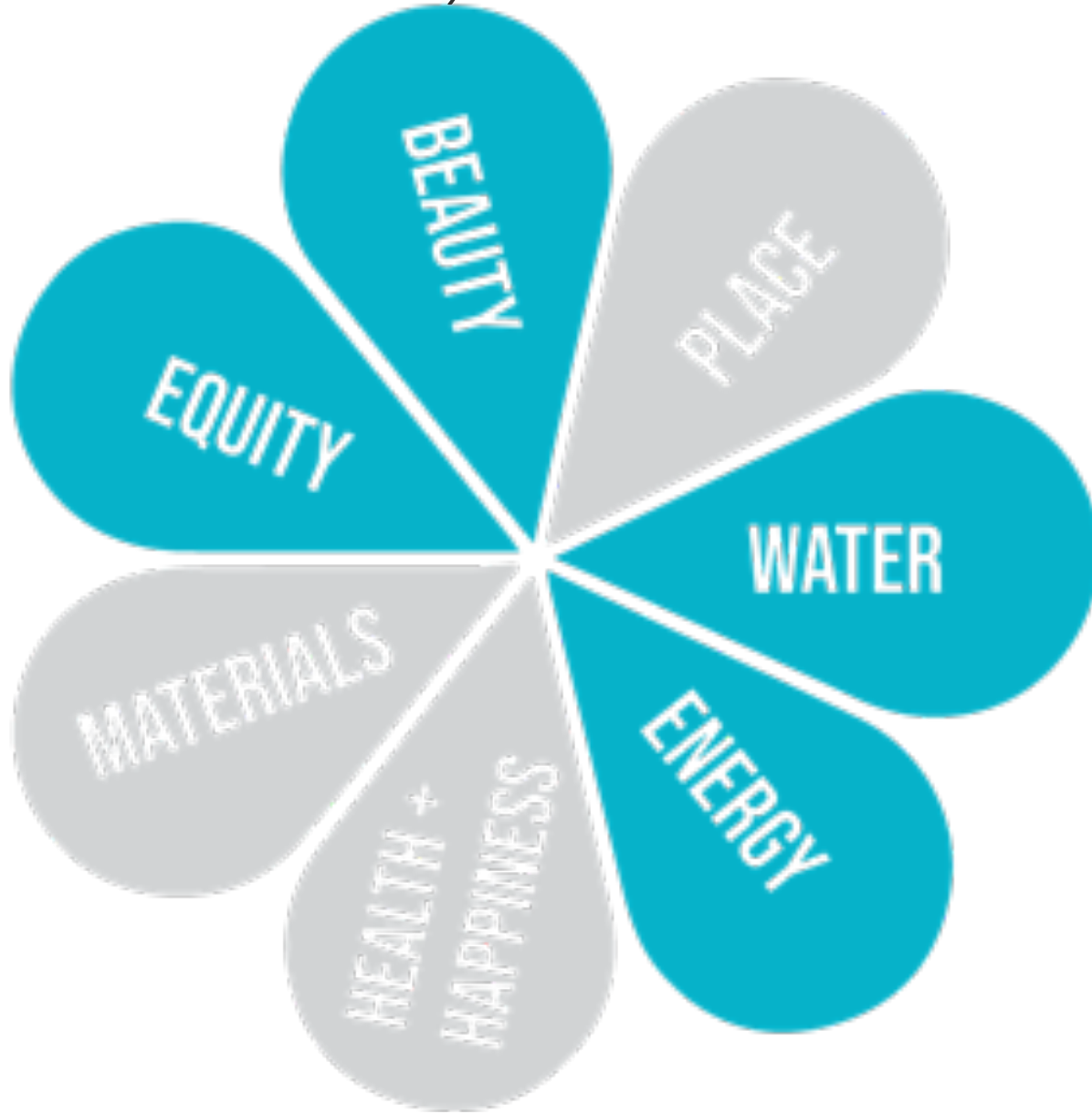
Contractor scope of work





# Sustainability

*Is Built in the Factory*



Disruptive strategies are needed to meet the 2030 building challenge of 100% net zero buildings

Factory built construction emits 43% less carbon than site built

Typically 10% of construction materials can end up waste, modular factories can achieve less than 2%

Passive house level envelope for a 4-8% increase

Single source of procurement for specified materials

Skilled labor trades can be cross-trained in many construction fields with experience in manufacturing and even robotics!



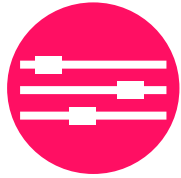
## Modular Benefits

# Modular Benefits



## Stable Pricing

- Factory work is done under contract
- No wage requirements for factory-built structures



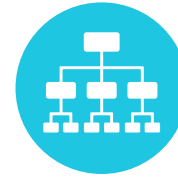
## Build in Controlled Environment

- Multiple buildings can have duplicate parts ensuring brand consistency
- Trade damage and sequence issues are avoided in factory



## Excellent Quality Control

- Factory allows for high quality and consistency within a controlled environment
- Multiple buildings in a portfolio can be assembled with similar parts ensuring brand quality



## Assembly Line Efficiency

- Modules arrive with finishes in apartments
- Modules set onsite in weeks rather than months of framing



## Pre-Approved Building Components

- State-approved building plans make up most of local building permit
- Pre-approved modular units can be re-used in multiple projects, expediting permit process



A modern living room with a large window, a sofa, a coffee table, and a desk with a lamp. The room is bright and airy, with light-colored walls and wooden flooring. The text "Product Design Benefits" is overlaid in the center of the image.

## Product Design Benefits

# Product Design Benefits



Pre-set Design  
Prices



More Focus on  
Amenities



Design - Test -  
Redesign



Unique Product  
Repetitive Parts

Modular  
Builder



# COLLABORATION



Jurisdiction



Design Team

> Questions?

This concludes The American Institute of Architects  
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