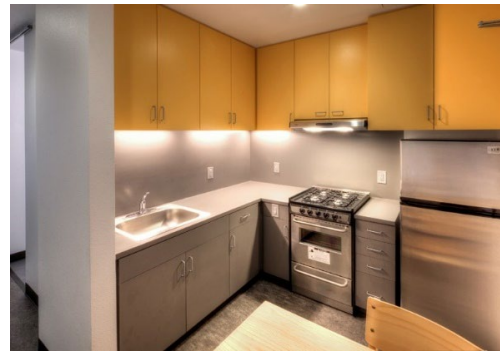


Multifamily Housing Solutions Using Modular Construction

This presentation is a modified version of a presentation given at Housing Oregon's Industry Support Conference in spring and fall of 2018. The earlier presentation was prepared by a panel of construction, architecture, and other professionals representing multiple organizations. This modified version was prepared by Jenn Sharp, senior construction project manager at Housing Development Center.

Housing
Development
Center

Multifamily Housing Solutions Using Modular Construction



Star Apartments
Skid Row Housing
Trust

Multifamily Housing Solutions Using Modular Construction

Factory Built Housing

Manufactured
Housing

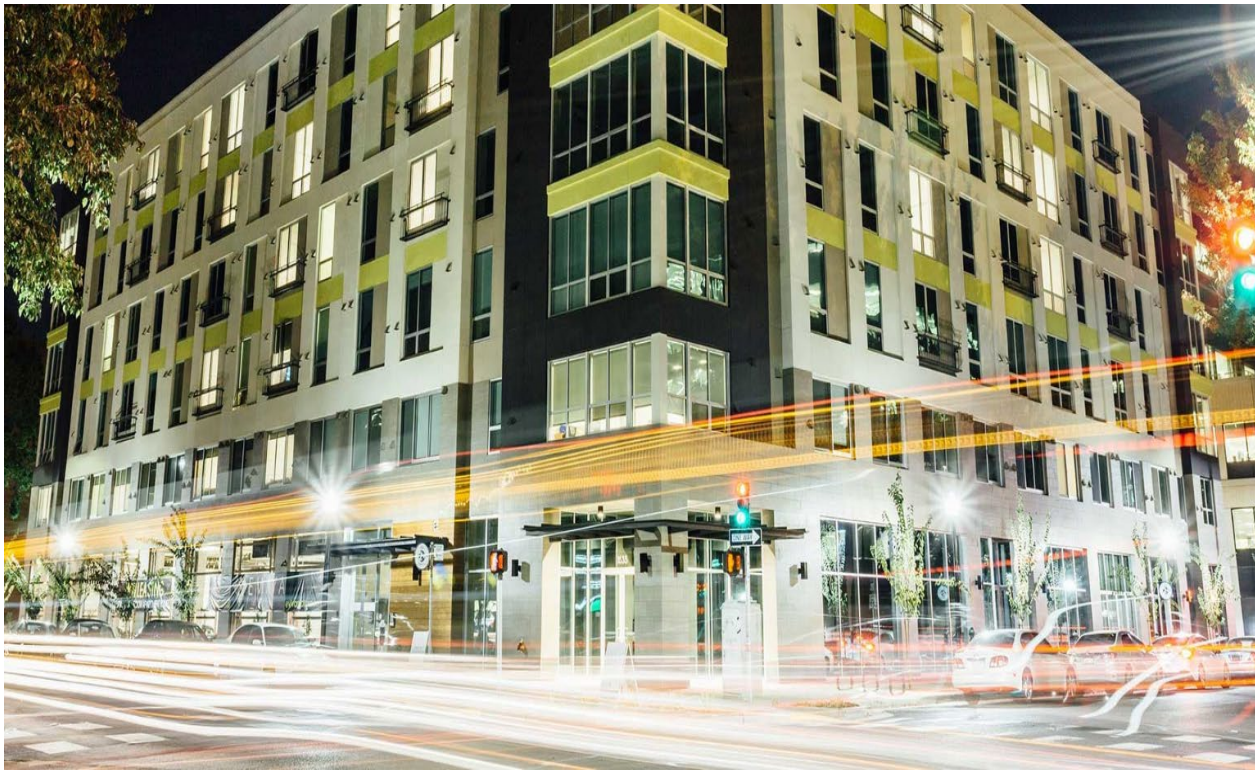
Modular
Housing

Panelized
Housing

WHAT YOU MAY BE THINKING.....



WHAT YOU SHOULD BE THINKING



Multifamily Housing Solutions Using Modular Construction



Manufactured Housing

Manufactured homes are built in factories. They conform to a federal building code, called the HUD code, rather than to building codes at their destinations. **Manufactured homes** are built on a non-removable steel chassis. Each home is substantially complete when it leaves the factory, with a small amount of work left to be completed on site.

- Formerly referred to as mobile homes or trailers, but with many more style options than in the past.
- Manufactured homes are built on a non -removable steel chassis.
- Sections are transported to the building site on their own wheels.
- Segments are not always placed on a permanent foundation.
- Building inspectors check the work done locally (electric hook - up, etc.) but are not required to approve the structure.

Factory Built Housing Options



Factory Built Housing Options

Manufactured Housing



Factory Built Housing Options



Manufactured Housing

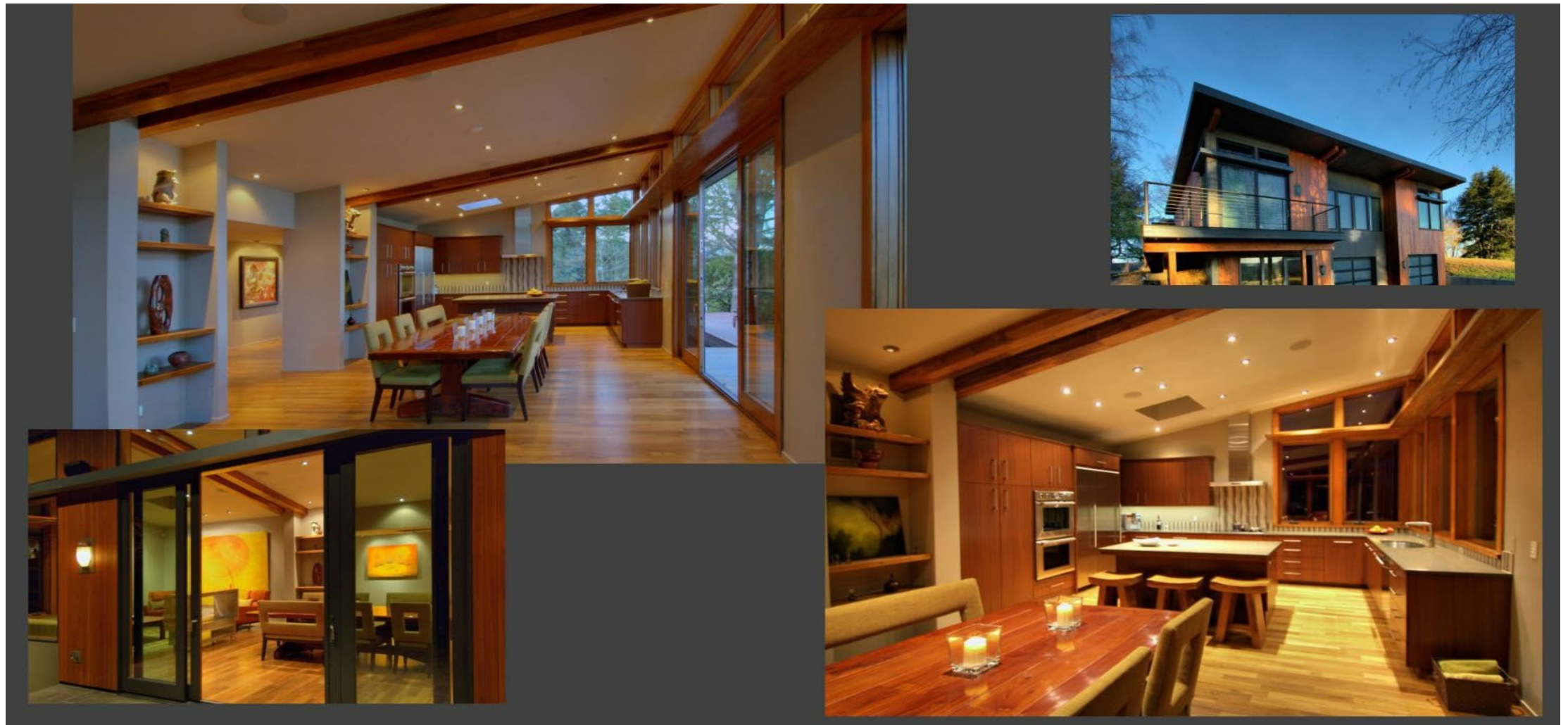


Modular Structures

What is a Modular Structure?

- Modular structures are built in sections at factories.
- Modular structures are built to conform to all state, local, or regional building codes at their **final** destinations.
- Sections are transported to the building site on (low-boy) truck beds, then joined together by local contractors.
- Local building inspectors check to make sure a modular structure meets requirements and that all finish work is done properly.

Modular Homes



Multifamily Housing Modular Construction



MODS PDX

Multifamily Housing Modular Construction



Multifamily Housing Modular Construction



Panelized Construction

What is panelized construction?

Panelized construction - or panelization - is the process of building wall, roof, and floor sections in an environmentally controlled manufacturing facility and delivering them to the construction site for installation.

Originally popular in the single-family home market, the use of panelized construction techniques is rapidly increasing for multifamily apartment buildings and motel/hotel facilities. These are not just low-budget, small apartment buildings in rural communities, but also large, 100-unit-plus, upscale senior housing complexes in urban settings.

Panelized Construction



Multifamily Housing Using Modular Construction

Why use offsite construction?

Offsite construction, or construction fabricated within a controlled factory setting, provides many efficiencies that cannot be met with conventional construction.

- Very little waste associated with construction
- Higher standards QA/QC
- Shortens project schedules (in most cases)
- Provides an option for construction in areas where conventional construction timelines are limited due to weather, i.e., snow, rain, ice, etc.
- Decreases job-site safety hazards
- Allows for consistent labor and trade forces.

Multifamily Housing Using Modular Construction

What's in it for General Contractors?

- Versatile options for your clients
- Projects that take fewer subs, less time and less manpower
- Experience in a wider scope of construction
- The existing clients who want modular, need General Contractors with experience

The Process Schedule

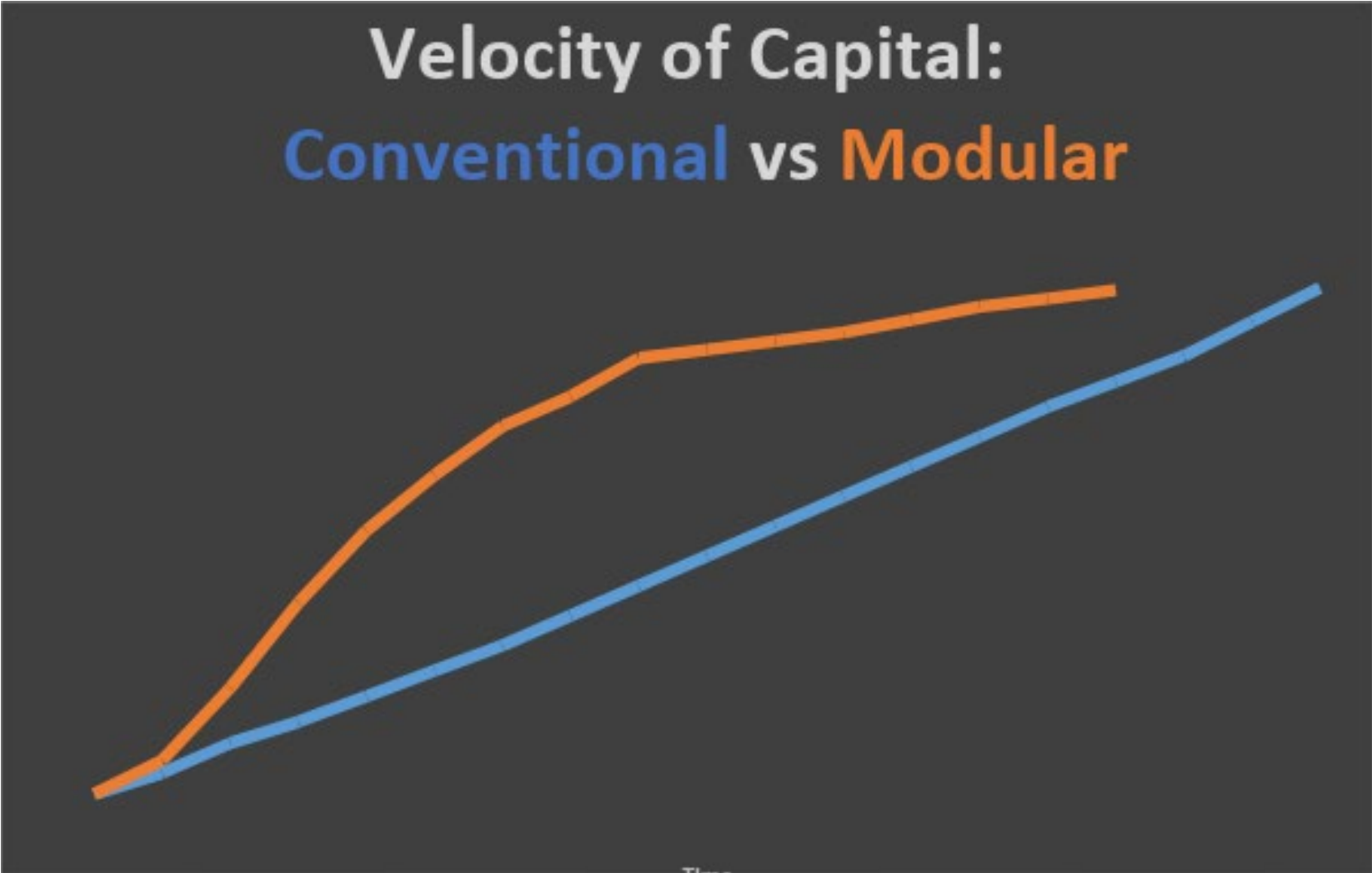
MODULAR CONSTRUCTION SCHEDULE



SITE-BUILT CONSTRUCTION SCHEDULE

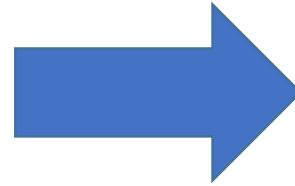


Multifamily Housing Using Modular Construction



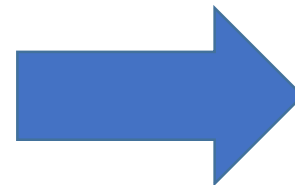
Permits, Approval and Inspections

Local work is approved and inspected by Local Authorities



Site Development
Foundation
Utility Connections
Structural Connections
Fire (Sprinkler) Inspections

Offsite work (factory) is approved and inspected by the State (label)



Structural Inspections
Mechanical (HVAC) Inspections
Electrical Inspections
Plumbing Inspections

Washington State Labor and Industries
Oregon Department of Housing
Calif. Housing Community Development

Modular Factory



Inside the Plant



Temperature Controlled Environment



Modular Placement and Connection



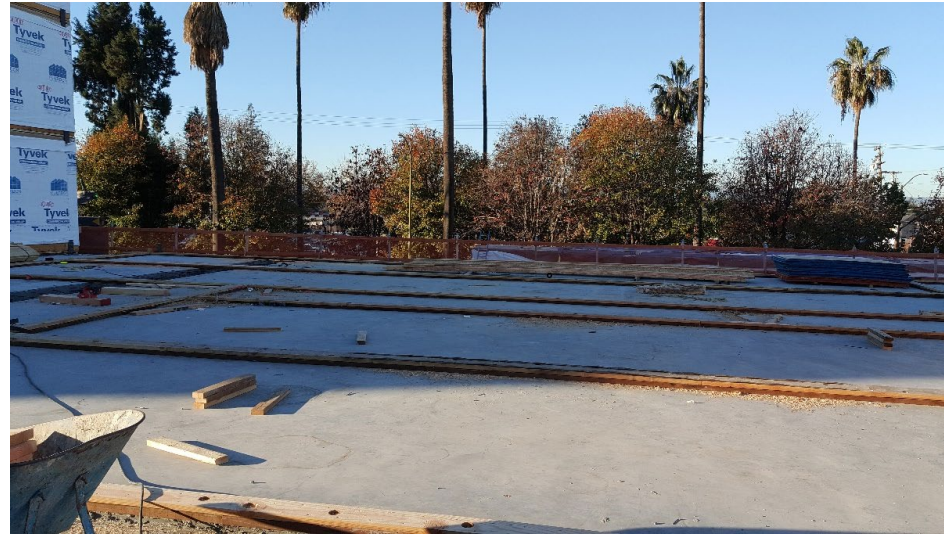
Precision Placement



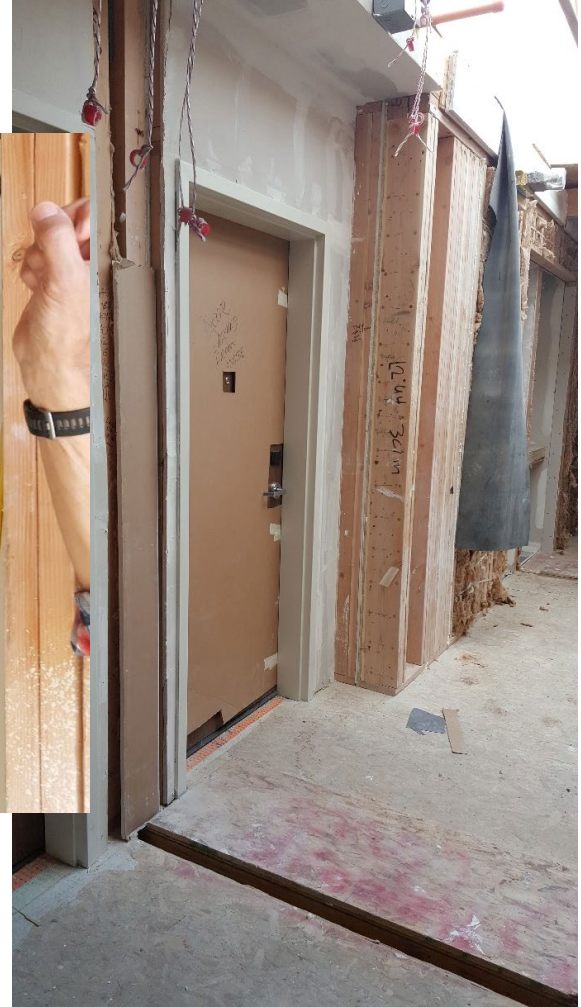
Exterior Connections



Connecting the Pieces



Corridors and Connection Points



Up to and Including Furniture, Fixtures, and Equipment



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Case Study, Currently in Progress
Breaking Ground in April 2019

Transition Projects, Inc. | Low Income Single Adult Housing
Kenton Neighborhood, North Portland

42 Units (72 Beds)

- 35 Studio
- 1 One Bedroom
- 6 Single Residence Occupancy (SRO)

Project Team

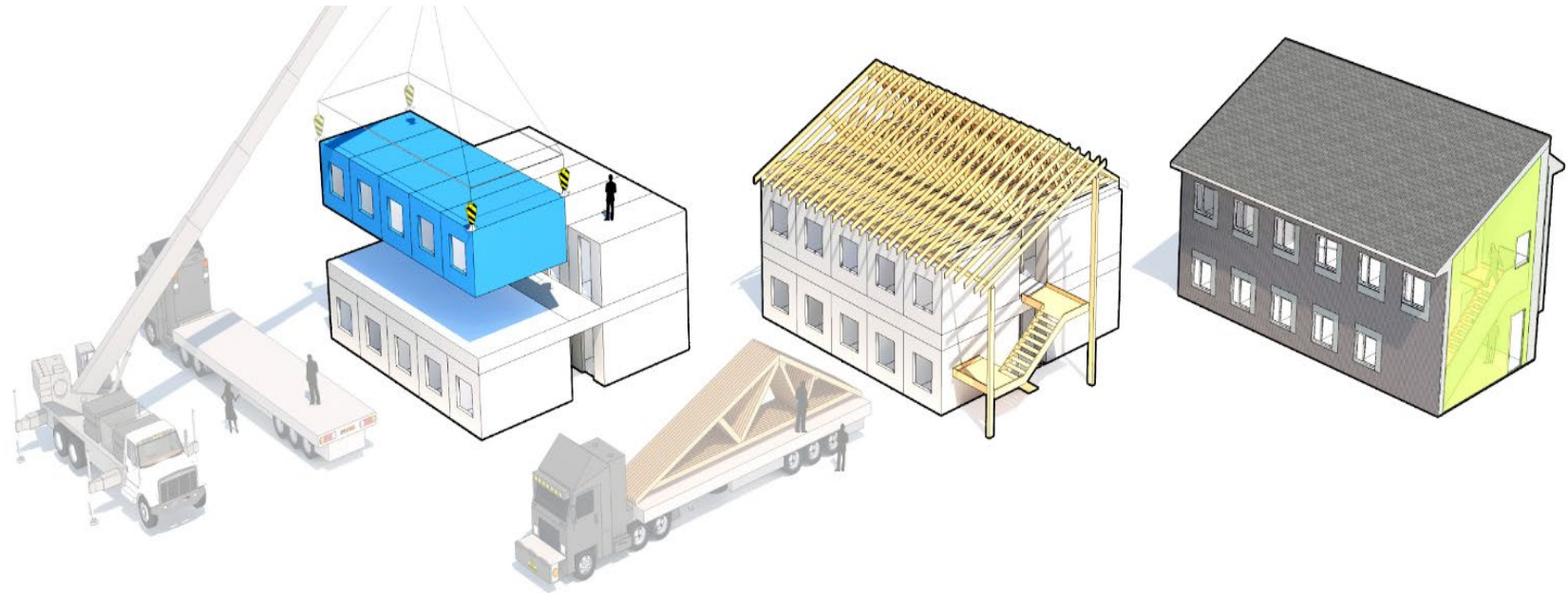
- Housing Development Center, Development Consultant
- Holst Architecture
- Walsh Construction, General Contractor
- MODSpdx, Modular Builder



SRO Formula



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Boxes

- SRO
 - 15'6" x 40'9"
- Studio Building
 - 15'6" x 46'9" or 15'6" x 62'2"

Site Built Components

- Elevator Shaft
- Stairwells
- Common Room, Laundry, Food Pantry, and Two Offices

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Details to Keep in Mind During Predevelopment

Take time to educate lenders.

- Arrange a site visit to the modular construction plant in advance of beginning talks.

Determine how the modular contract will be packaged.

- In the general contractor's scope or as a separate contract.

Establish values the modular builder will require in advance of closing or at closing.

- Cash deposit to hold time on the production line—if required.
- Upon project approval
- As determined by the team prior to entering into a contract and clearly communicated to lenders, assuming they are allowable.

Agree upon a flow of funds.

- Via the GC or directly to the modular contractor for milestone installments.

Arrange for insurance and custody of boxes.

- In the plant
- In transit
- During installation

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Top Take-Aways

Start with modular. Don't try to fit a project that's already designed into a modular footprint; you will be paying for the design twice.

Partner early. The modular builder and architect need to be hired simultaneously.

Prepare for a compressed schedule. A modular project is fast-track from day one and never slows down. The team doesn't have the luxury of time to make changes as you do on a stick-frame project.

Expect greater building durability and longevity. Projects using modular are inherently more durable, because the building materials are never exposed to the elements, and the enhanced structure make them stronger than stick-built.

Expect a finished product that looks identical to site-built. At the point of completion, there is no way to tell the two construction methods apart.



“Modular vs. Traditional: In the battle for supremacy, these two distinctly different construction methods often yield indistinguishable results. For many, the battle is lost or won by their ability to deliver quality buildings and ROI quickly.” Freshome.com