
CANADIAN HOME BUILDERS' ASSOCIATION
netzero home
LEADERSHIP SUMMIT
Welcome

MEET OUR DAY 1 CO-HOSTS!

Sonja Winkelmann,
Senior Director, Net Zero Energy Housing, CHBA

Chris Williams,
Vice President, Avalon Master Builder

Land Acknowledgement

We acknowledge that the land where the Richmond Neighborhood is located rests on the traditional territories of the Musqueam, Squamish, and Tsleil-Waututh.

We also acknowledge the systemic policies of genocide, relocation, and assimilation that still impact many Indigenous families today.

As settlers and guests on these lands we respect the work of Native Nations, leaders, and families, and make ongoing efforts to center Indigenous knowledge, creativity, and resilience.


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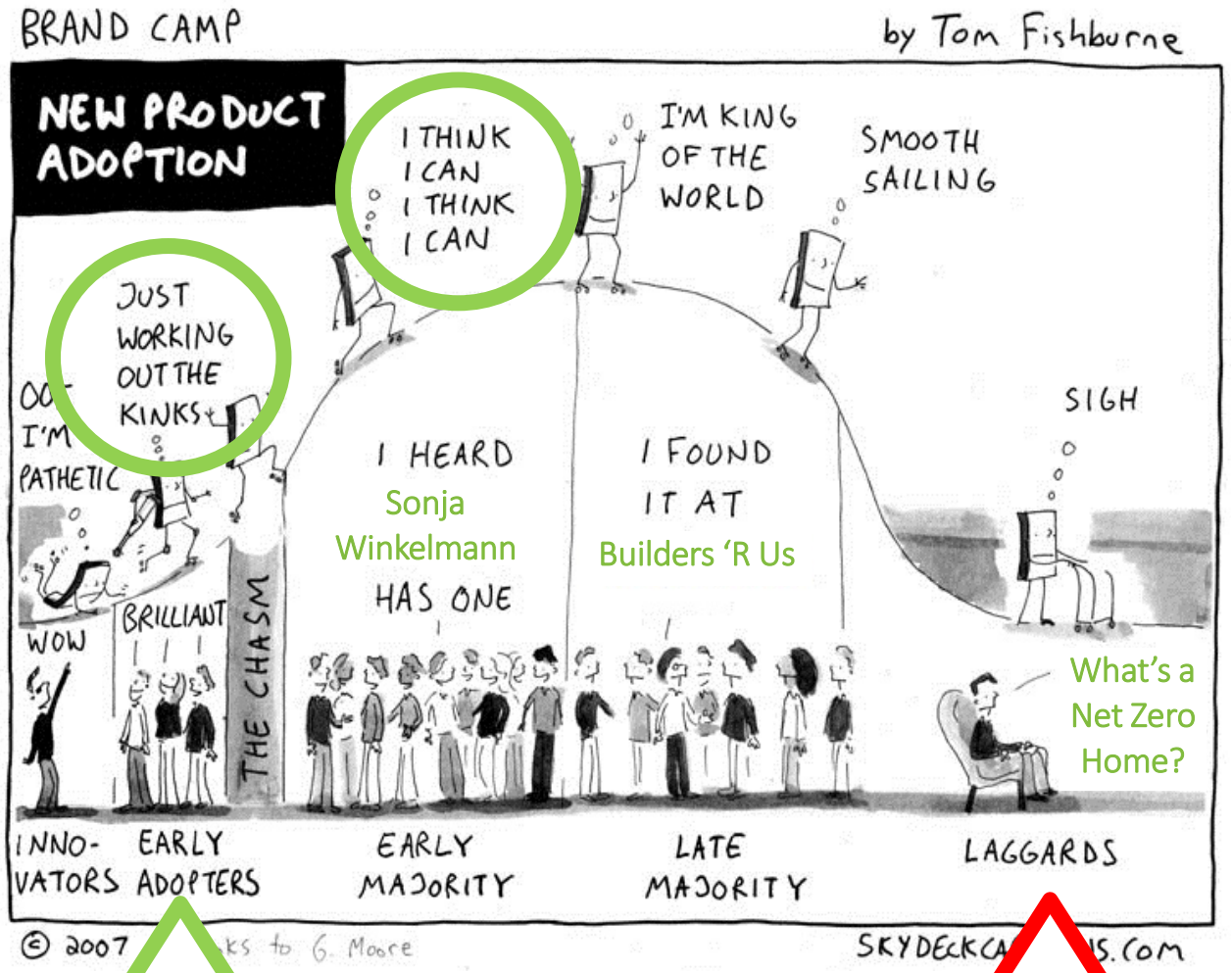
#NZLeadershipSummit
#NZLS2024
tag us! @CHBANetZero


Building Codes
Builders

The Diffusion of Innovations



THE PREDICAMENT OF KNOWLEDGE

- Innovators & early adopters are the holders of the most current knowledge.
- To be able to "cross the chasm" we must disseminate this knowledge, **shortening the learning curve and paving the way for the early majority.**
- The challenge is to effectively apply what we already know and what we continue to learn, en masse.

Voluntary Programs

Building Codes

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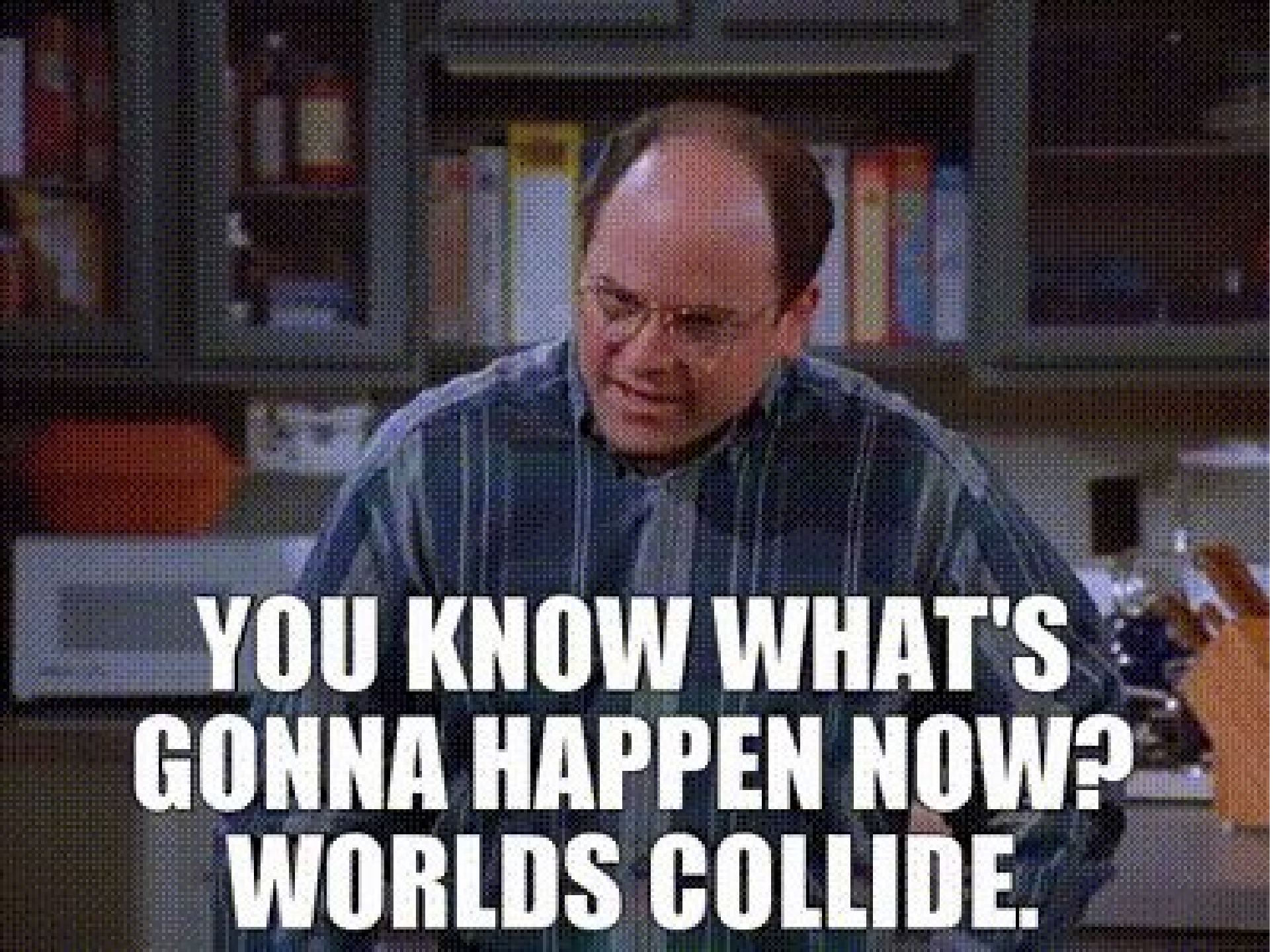

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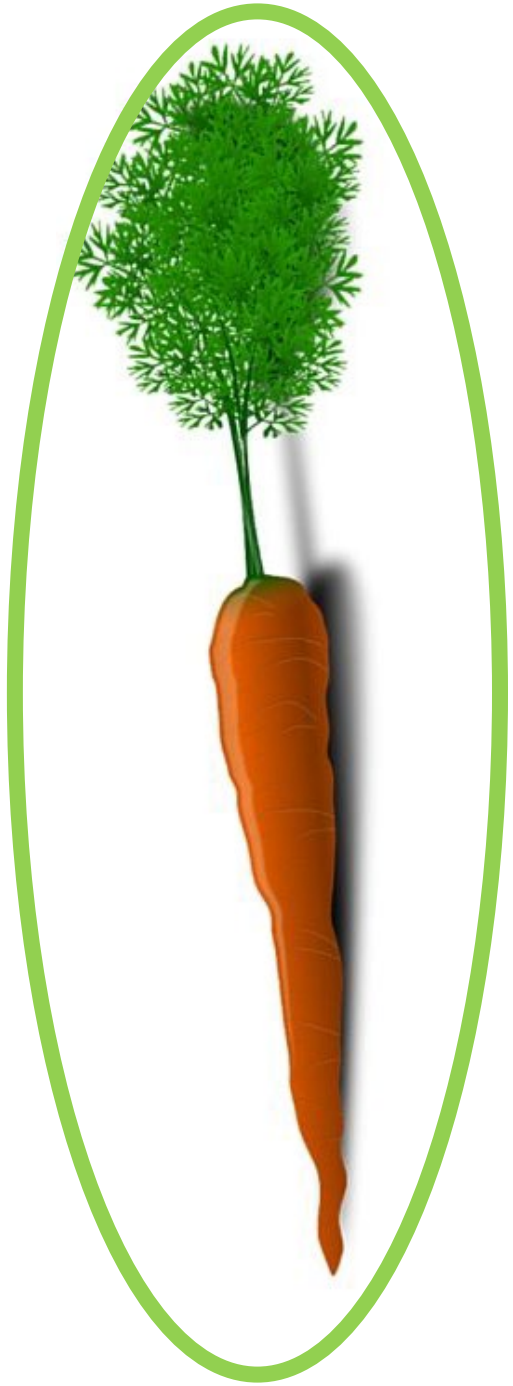

vs.

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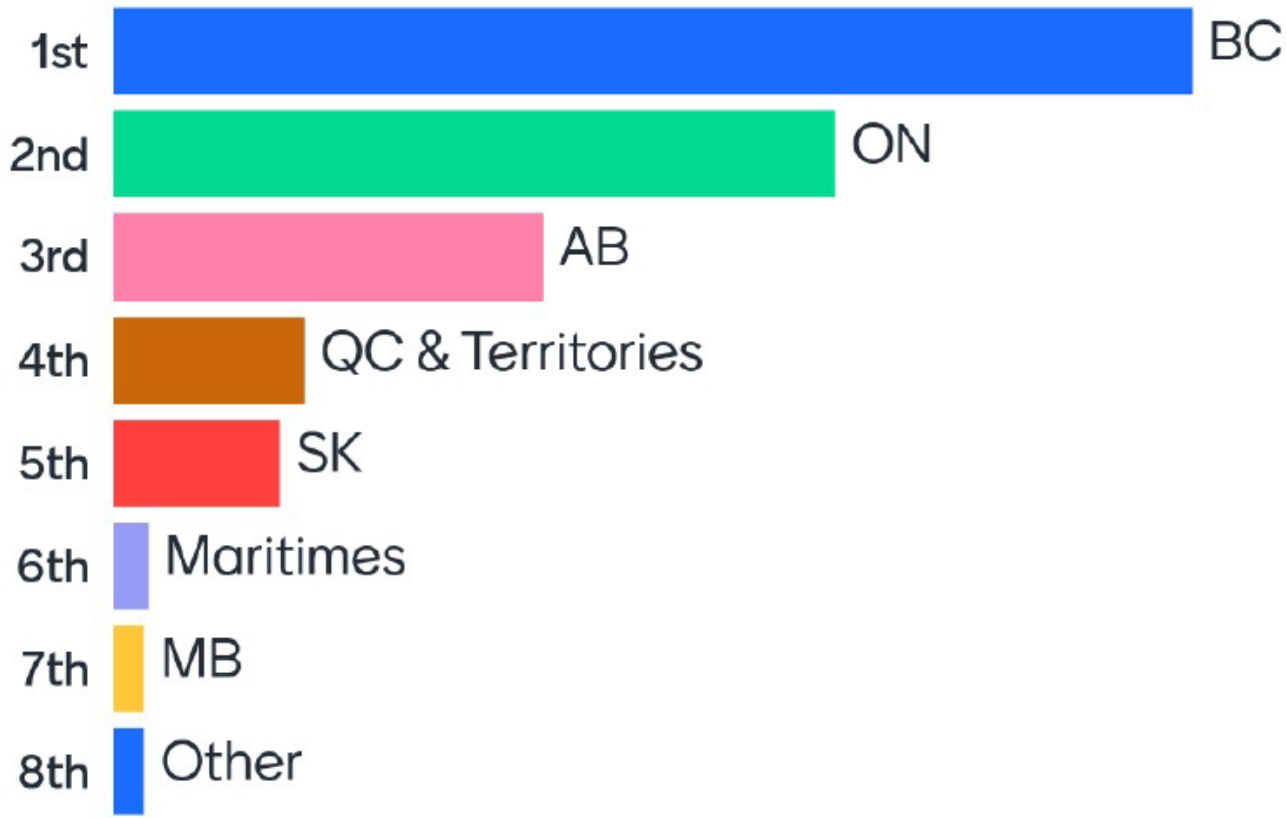
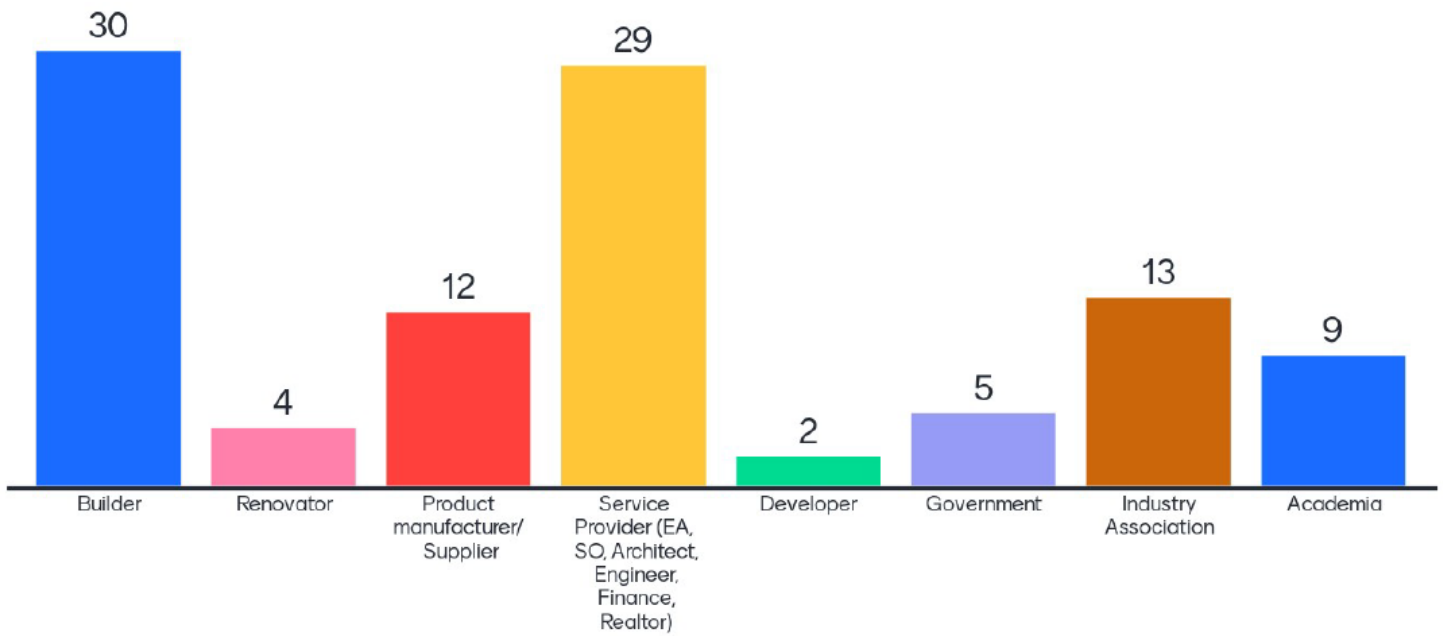
Where are you from?

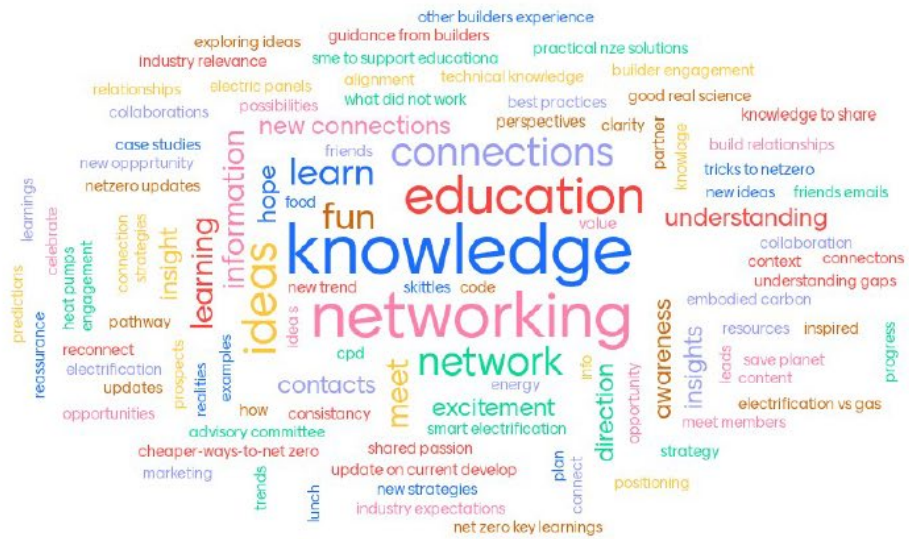


Who are you?


30
4
12
29
2
5
13
9
Builder
Renovator
Product manufacturer/ Supplier
Service Provider (EA, SO, Architect, Engineer, Finance, Realtor)
Developer
Government
Industry Association
Academia

What do you want to get out of the event?

214 responses



Day 1 Agenda

Find it online at **www.chba.ca/nzls**

8:30 AM	**CATALYZING PREFABRICATION THROUGH DESIGN to achieve higher performance in housing.**
10:15 AM	Break and networking in the DEMO HUB
10:45 AM	**FINDING THE EMISSIONS SWEET SPOT. How much is too much?**
12:00 PM	Lunch Buffet and networking in the DEMO HUB
1:15 PM	**WHO'S DOING WHAT? And is it enough to get us there?**
2:30 PM	Break and networking in the DEMO HUB
3:00 PM	**SAFE HAVENS. Protecting our assets and our families.**
4:15 PM	Day 1 wrap-up
5:00 PM – 9:15 PM	Cocktails and buffet dinner, Open Mic, “High Performance Brain” auction, and networking in the DEMO HUB

Access the full agenda online here:

Access the speaker info online here:

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CATALYZING PREFABRICATION THROUGH DESIGN to achieve higher performance in housing.


Kevin Lee
CEO, CHBA
Keith Herring
Director, Modular & Construction Systems, CHBA
Mike Schmidt
President, Auto Construct Incorporated
Chris Williams
Vice President, Avalon Master Builder
Neil Hawkins
Development Manager, Avalon Master Builder

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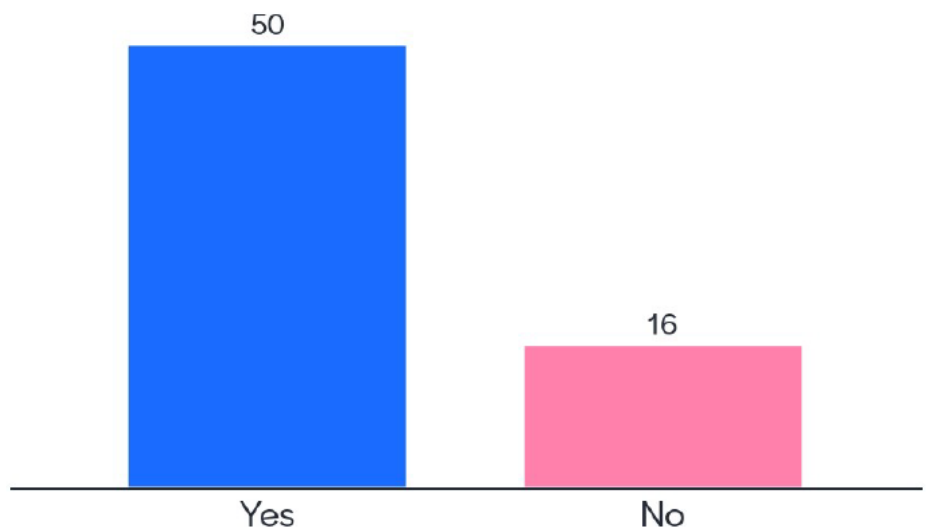
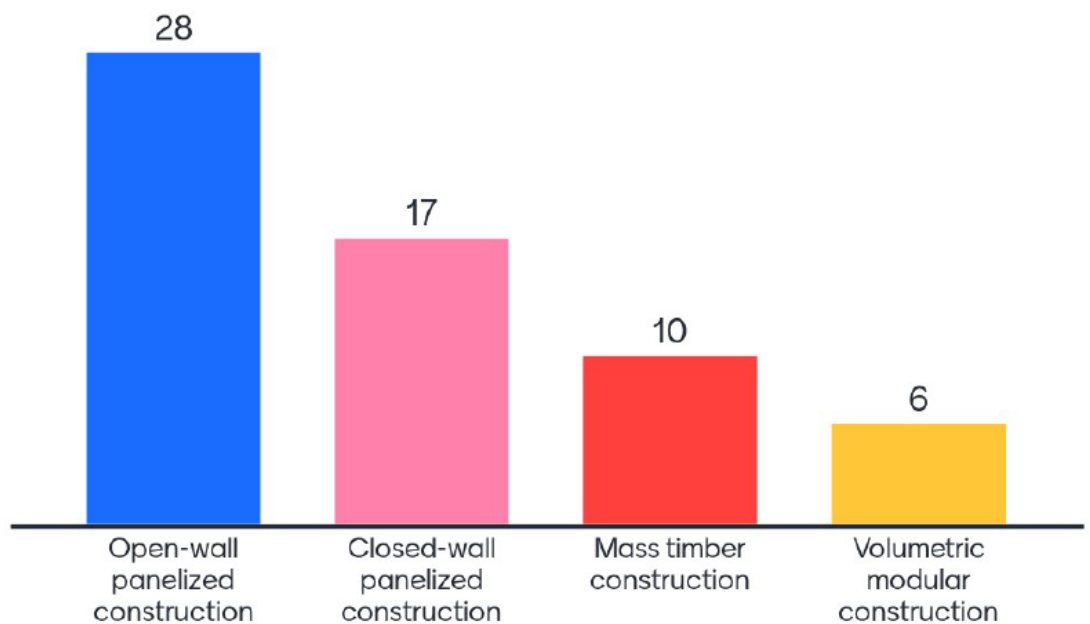
Kevin Lee,
CEO, CHBA

Builders/Renovators: Have you tried any level of prefabrication?

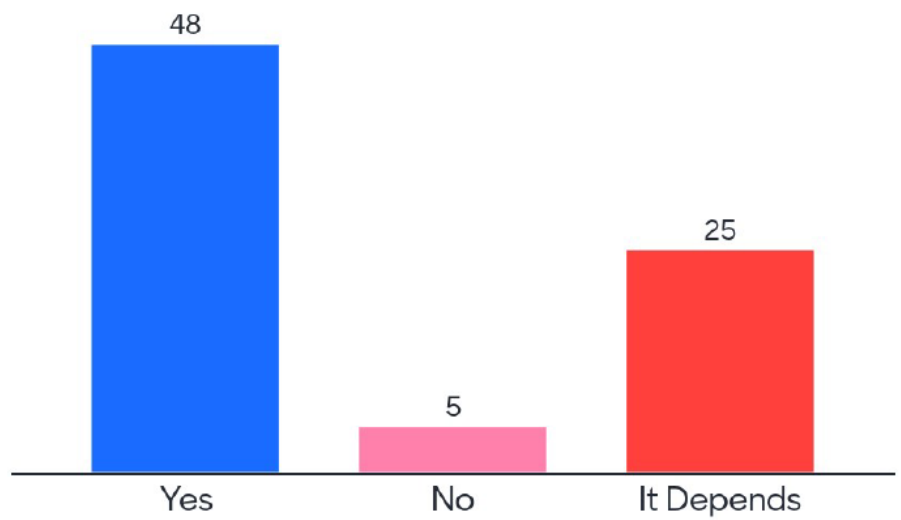


SESSION 1 - CATALYZING PREFABRICATION THROUGH DESIGN

What have you worked with?

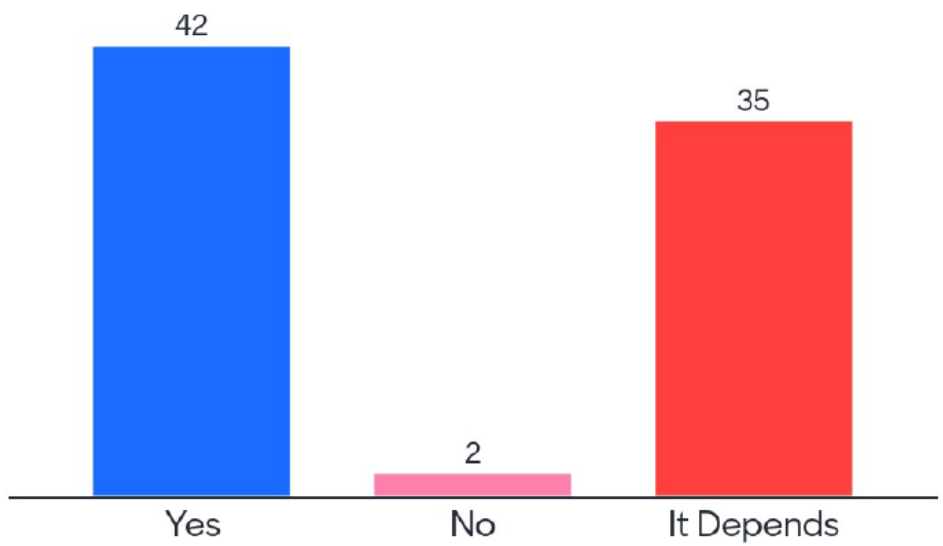


Do you believe prefab could help build more affordable housing?



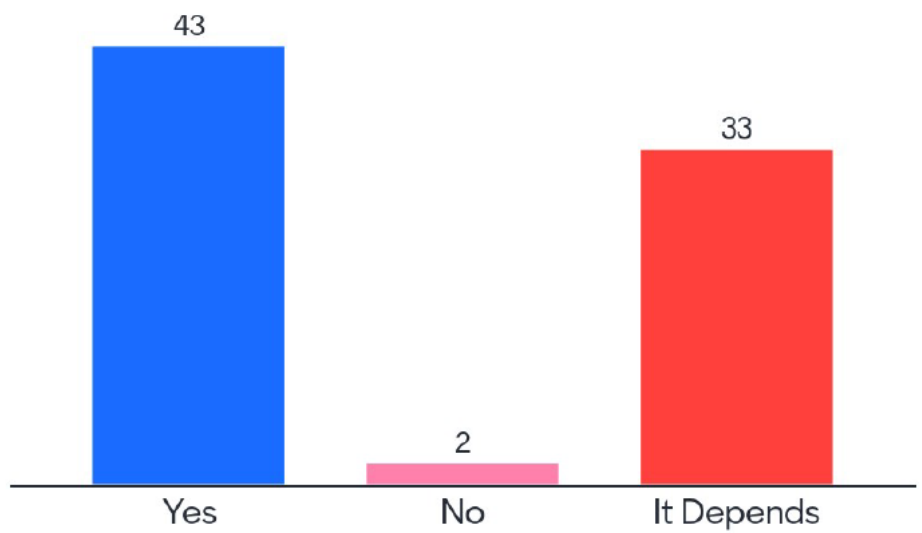
SESSION 1 - CATALYZING PREFABRICATION THROUGH DESIGN

Do you believe prefab could help build more energy efficient and climate resilient housing?



SESSION 1 - CATALYZING PREFABRICATION THROUGH DESIGN

Do you believe prefab could help you build better, faster, and cheaper?



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Keith Herring, Director, Modular and Construction Systems, CHBA

CHBA MODULAR CONSTRUCTION COUNCIL

Canadian Home Builders' Association

Modular Construction Council Strategic Plan

- Sector Transition Strategy - B2G and B2B, automation, multi-family modular, panels, industry and municipal awareness
- Recognition of the carbon impact
- Application for funding for transition HUB for factory built is being completed in summer 2024

Sector Transition Strategy HUB

- What can we do?
- Facilitate education, training and transition, building officials
- Provide Soft Cost financing, infrastructure Investments, tax incentives, distribute funds for other subsidiary and supplier industries

CHBA SECTOR TRANSITION STRATEGY

Canadian Home Builders' Association

SECTOR TRANSITION STRATEGY

Solutions to the barriers preventing Canada from building 5.8 million homes

Canadian Home Builders' Association
141 Laurier Avenue West, Suite 500
Ottawa, ON K1P 5J3

www.chba.ca | @CHBANational

GETTING TO 5.8 MILLION HOMES

Accomplishing the goal of doubling housing starts is a complex matter that is not achievable with the current status quo. To do it, we need a whole-systems approach by all governments at the local, provincial and federal level.

Canada's housing industry cannot build 5.8 million homes without the government supporting systemic change in four areas: financial, policy, labour, and productivity.

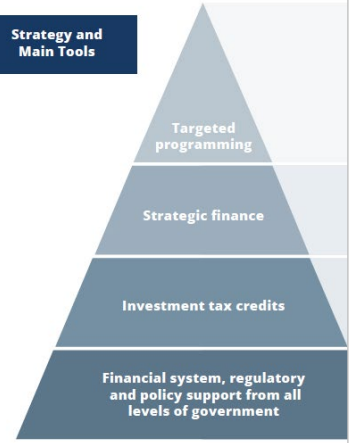
CHBA's Sector Transition Strategy builds on and relies on enactment of CHBA's recommendations to address housing affordability and supply to create the environment where housing production can actually increase. It then focuses on supporting and de-risking an industry transition to incorporated more factory-built systems in order to increase productivity with the goal of addressing Canada's 3.5 million housing unit supply deficit.

- Continue federal leadership but ensure a holistic approach
- Remove barriers to homeownership for first-time buyers
- Lower government-imposed costs that add to affordability challenges
- Remove barriers within the home building process
- Avoid adding costs through codes and regulations
- Address labour shortages
- Support increased productivity

HOW GOVERNMENT CAN SUPPORT CHBA'S SECTOR TRANSITION STRATEGY FOR HOUSING SUPPLY

There are concrete steps the government can take to help to address Canada's housing crisis and improve housing affordability through the increased productivity of factory-built solutions. The actions on on this page came from input and feedback from builders across the country, including critical insight from CHBA's Modular Construction Council, which is made up of representatives from many of Canada's current factories.

The pyramid on this page and the next is a made-in-Canada plan that will allow for the residential construction sector to transition to more factory-built homes to increase housing supply and build 5.8 million homes to close the supply deficit. It is modelled after *Canada's Plan for a Clean Economy*, as clean technology faces similar market penetration challenges. Just as the government stepped forward in Budget 2023 to address the climate crisis with a made-in-Canada plan for a clean economy, Canada needs a made-in-Canada plan for housing supply, using similar tools.



www.chba.ca/sectortransition

CALL TO ACTION

Canadian Home Builders' Association

Keith Herring

Director, Modular & Construction Systems

Canadian Home Builders' Association

289.251.0754 | keith.herring@chba.ca

Email me to discuss your needs and how to be part of the Sector Transition Strategy HUB!

Download the Sector Transition Strategy

www.chba.ca/sectortransition

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Mike Schmidt, President, Auto Construction Incorporated

The Prefabrication Journey

Start with a Strong Foundation

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AUTOCONSTRUCT INCORPORATED

www.autoconstruct.ca

What is your business objective?

Volume

Speed

Quality

Complexity

What form of prefabrication is best for your application?

Production Capacity

Manufacturing Footprint

Design Flexibility

Standard Freight

Speed of Construction

System Integration

Remote Work

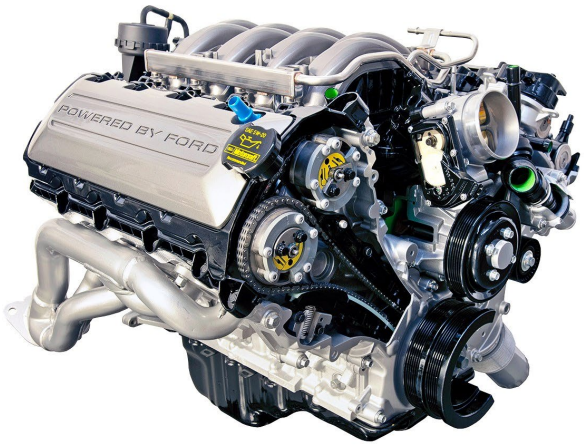
Inclement Weather

You don’t need a factory to get started.

Use the “Book-End Strategy”.

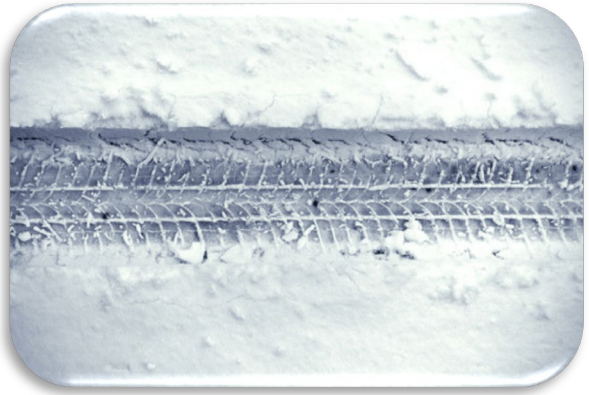
Take Control

Design for Manufacturing and Assembly



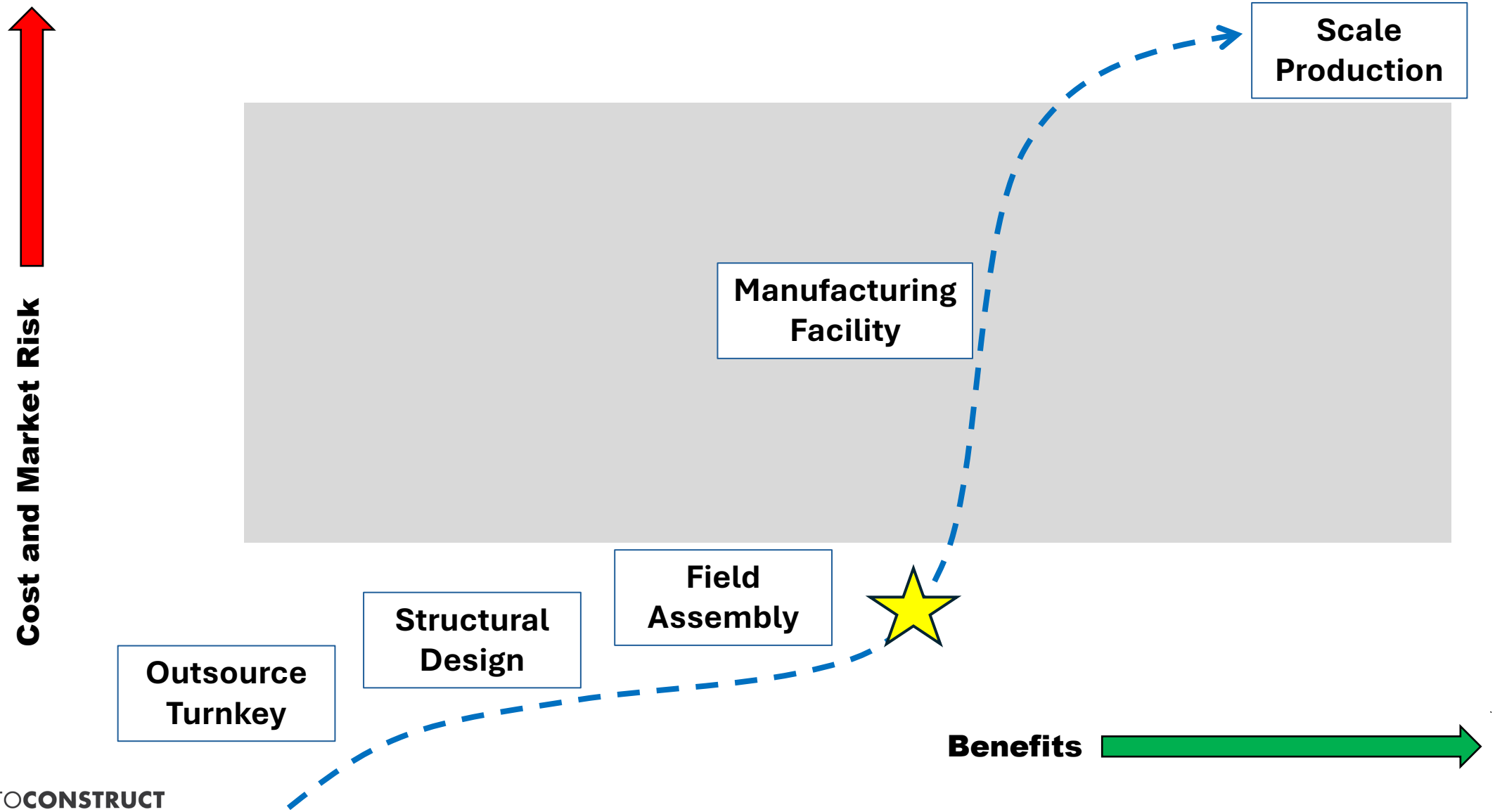
Manufacturing Facility

Get Traction



Field Execution

The Point of Diminishing Returns



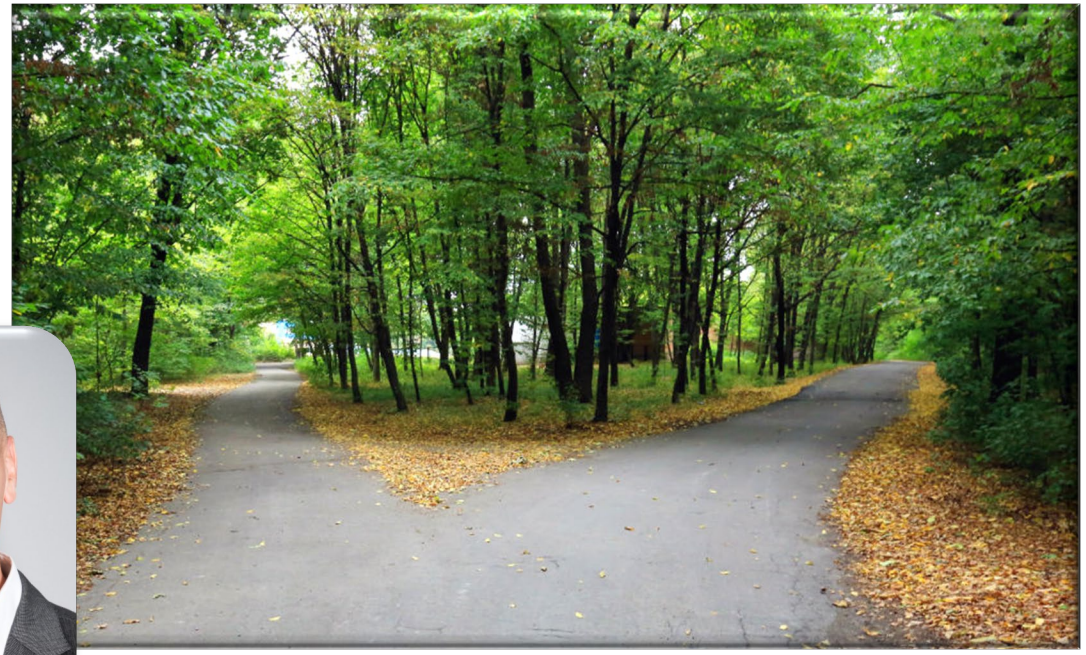
AUTOCONSTRUCT INCORPORATED

www.autoconstruct.ca

Begin with the end in mind.

“Onsite assembly informs offsite manufacturing.”

Thank you



Mike Schmidt
mike.schmidt@autoconstruct.ca
+1 780 964 1479

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Chris Williams, Vice President, Avalon Master Builder

Building a better Blender

Adoption of Technology to build repeatable and more cost-effective homes

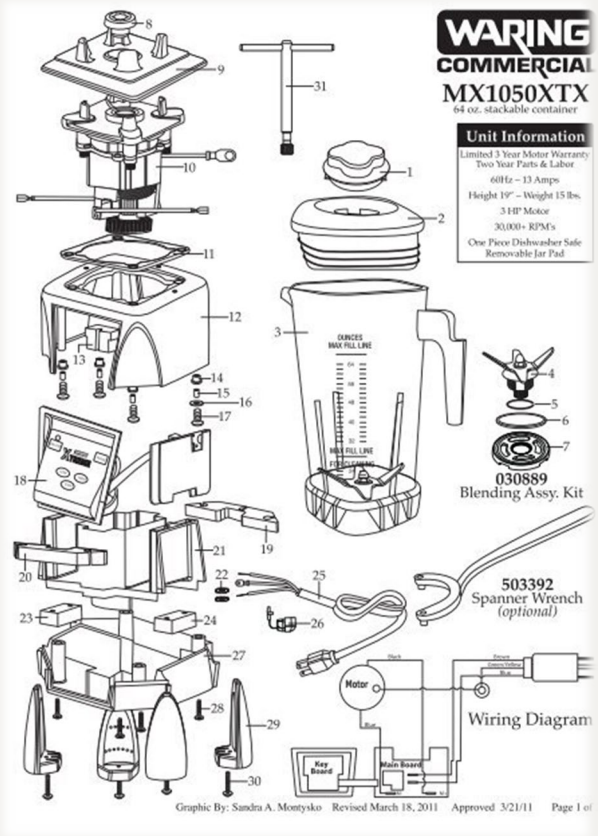
netzero home

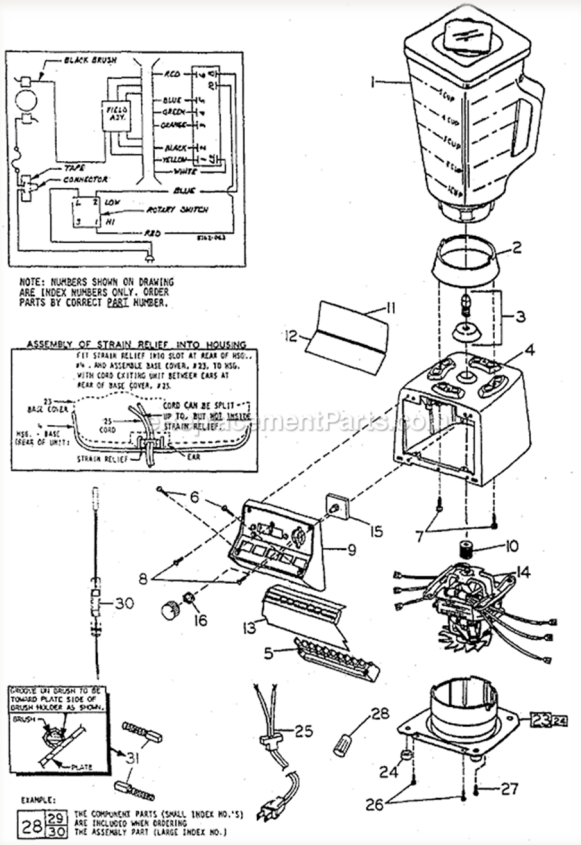
avalon

Building a better Blender

This is the same blender…

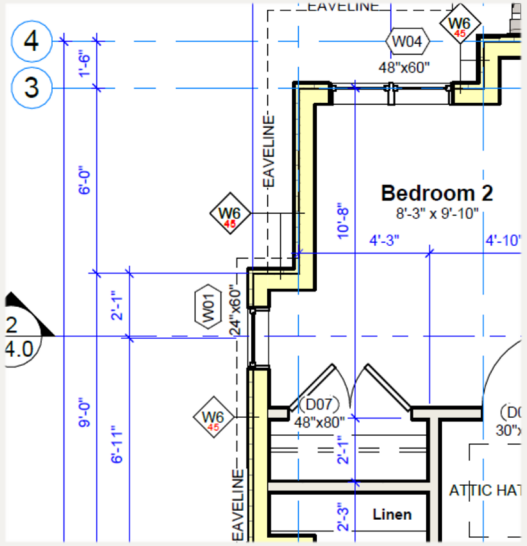
Building a better Blender





This is the same house…

Building a better Blender



W5 2X6 EXTERIOR WALL @PARTY WALL - 60min. FRR
- exterior cladding as per elevations / Material Chart installed as per manufacturer's specifications
- 3/8" plywood or OSB sheathing vertical strapping @16" o.c. (at exterior panel cladding locations only)
- 1 1/2" continuous XPS insulation
- 1 layer vapour permeable building paper, 30 min. or equiv., installed as per manufacturers specifications
- 5/8" Type-X gypsum sheathing, extended over rim board

- 2x6 wood studs spaced as per structural engineer
  - R24 batt insulation
- air space
- 2x4 wood studs, on flat inside edge to line up w/inside edge of adjacent interior party wall
  - fibreglass or mineral wool batt insulation
- 1 layer vapour permeable building paper
- 5/8" Type X gypsum board (to be continuous behind all abutting partitions; all penetrations must be sealed with firestop sealant)

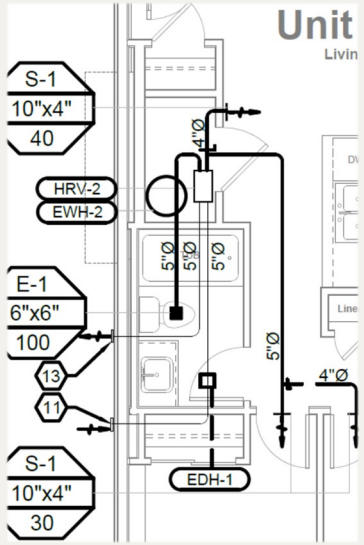
- 1/2" standard or mold-resistant gypsum board taped, filled & sanded for painting
- interior finish

-Framing Dimensions w/ general assembly notes

-Detailed wall ***assembly up to carpenter***

-Termination locations for Plumbing and HVAC

-Detailed ***plumbing and heat run up to mech trade***



HVAC DRAWING KEY NOTES: (#)

1. S/A FLOOR GRILLE. (S/A DUCT RUNNING IN FLOOR BELOW).
2. 4"Ø DRYER EXHAUST UP TO ROOF. INSTALL ROOF TERMINATION AS PER DRYER MANUFACTURER RECOMMENDATIONS.
3. 4"Ø EXHAUST. DUCT TO HRV.
4. 5"Ø SUPPLY AIR DUCT UP TO FLOOR GRILLE ABOVE.
5. 4"Ø SUPPLY AIR DUCT UP TO FLOOR GRILLE ABOVE.
6. RETURN AIR FROM ABOVE.
7. RUN DUCT THROUGH JOISTS. COORDINATE WITH STRUCTURAL AND ARCHITECTURAL.
8. EXHAUST WALL CAP C/W BACKDRAFT DAMPER.
9. SUPPLY GRILLE AT CEILING.
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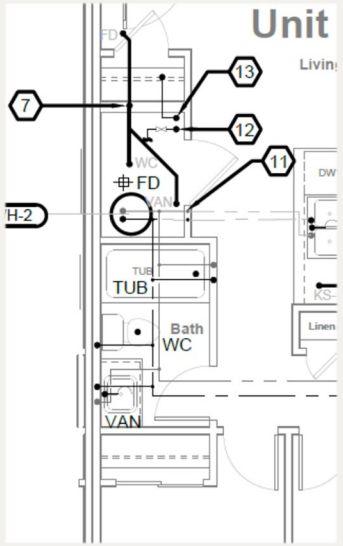
13. HRV EXHAUST TERMINATION. INSTALL AS PER HRV MANUFACTURER RECOMMENDATIONS.
14. 5"Ø EXHAUST DOWN TO HRV ON MAIN FLOOR.
15. 5"Ø EXHAUST FROM WASHROOMS ON TOP FLOOR.



PLUMBING DRAWING KEY NOTES: (#)

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3. ½" HOT AND COLD WATER UP.
4. ½" COLD WATER UP.
5. 4"Ø OVERHEAD SANITARY DOWN TO FLOOR BELOW.
6. 4"Ø SANITARY RISER FROM TOP FLOOR.
7. 4"Ø SANITARY DOWN TO UNDER SLAB.
8. ¾"Ø HOT AND COLD WATER LINES FOR TOP FLOOR.
9. 1"Ø COLD WATER FROM WATER METER ROOM.
10. PROVIDE LAUNDRY BOX WITH SANITARY, HOT AND COLD WATER OUTLETS AND WATER HAMMER ARRESTORS - OATEY MODEL QUADRO OR EQUIVALENT
11. ½"Ø H&C WATER DOWN TO FLOOR ASSEMBLY FOR KITCHEN SINK.
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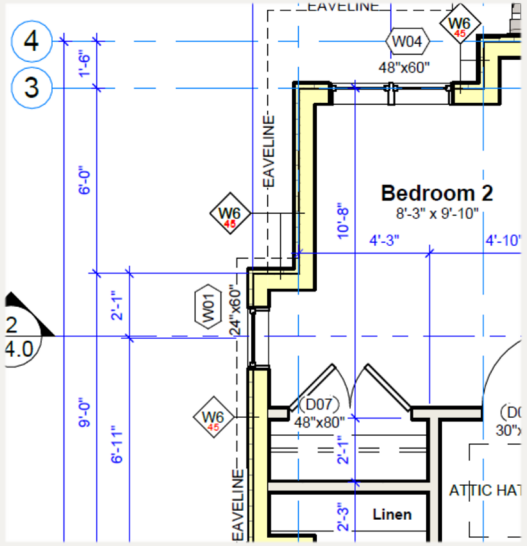
Building a better Blender



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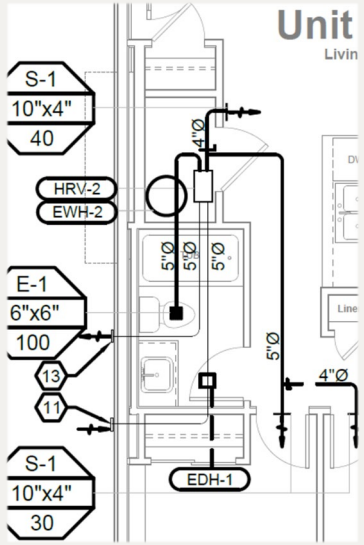

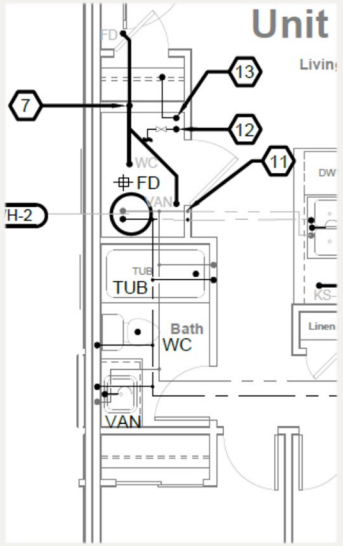

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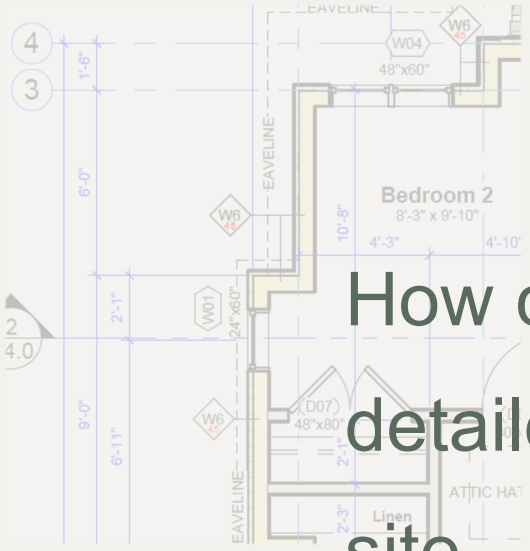
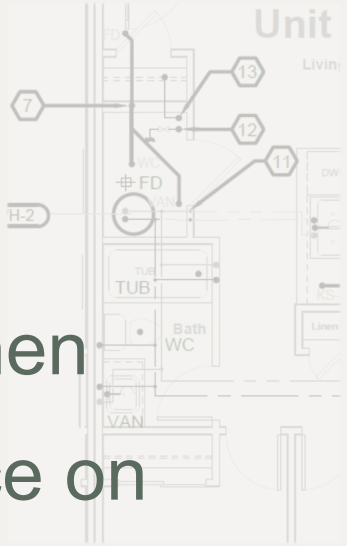
Building a better Blender





How can all variables be considered when detailed design --per scope-- takes place on site --independently-- during construction?

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  - R24 batt insulation
- air space
- 2x4 wood studs, on flat inside edge to line up w/inside edge of adjacent interior party wall
  - fibreglass or mineral wool batt insulation
- 1 layer vapour permeable building paper
- 5/8" Type X gypsum board (to be continuous behind all abutting partitions; all penetrations must be sealed with firestop sealant)

- 1/2" standard or mold-resistant gypsum board taped, filled & sanded for painting
- interior finish

1. S/A FLOOR GRILLE. (S/A DUCT RUNNING IN FLOOR BELOW).
2. 4"Ø DRYER EXHAUST UP TO ROOF. INSTALL ROOF TERMINATION AS PER DRYER MANUFACTURER RECOMMENDATIONS.
3. 4"Ø EXHAUST. DUCT TO HRV.
4. 5"Ø SUPPLY AIR DUCT UP TO FLOOR GRILLE ABOVE.
5. 4"Ø SUPPLY AIR DUCT UP TO FLOOR GRILLE ABOVE.
6. RETURN AIR FROM ABOVE.
7. RUN DUCT THROUGH JOISTS. COORDINATE WITH STRUCTURAL AND ARCHITECTURAL.
8. EXHAUST WALL CAP C/W BACKDRAFT DAMPER.
9. SUPPLY GRILLE AT CEILING.
10. DRYER EXHAUST. INSTALL WALL CAP AS PER DRYER MANUFACTURER RECOMMENDATIONS.
11. HRV INTAKE TERMINATION. INSTALL AS PER HRV MANUFACTURER RECOMMENDATIONS.
12. OUTDOOR UNIT FOR HP-1. RUN REFRIGERANT LINES BETWEEN THE UNITS. REFER TO MANUFACTURER INSTALLATION MANUAL FOR REFRIGERANT PIPING RUNS AND UNIT CLEARANCES.
13. HRV EXHAUST TERMINATION. INSTALL AS PER HRV MANUFACTURER RECOMMENDATIONS.
14. 5"Ø EXHAUST DOWN TO HRV ON MAIN FLOOR.
15. 5"Ø EXHAUST FROM WASHROOMS ON TOP FLOOR.

PLUMBING DRAWING KEY NOTES: (#)

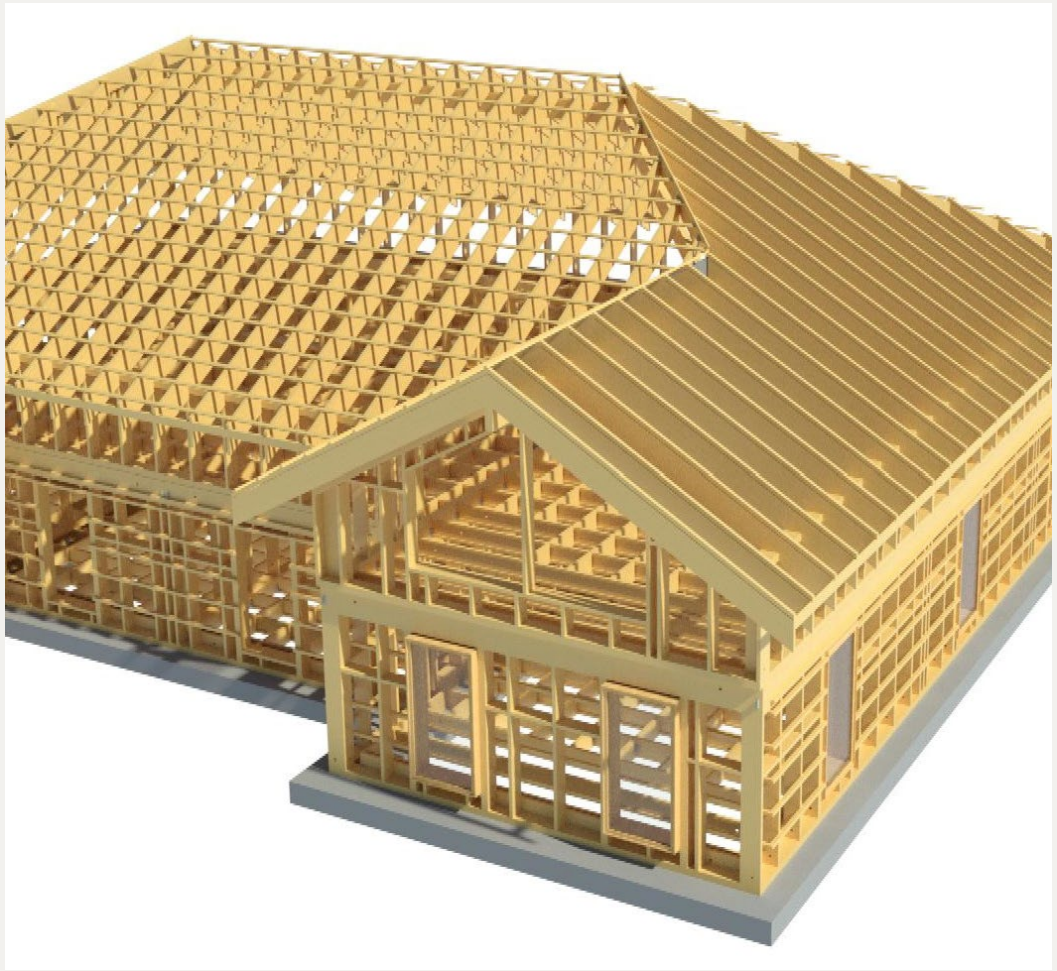
1. ½" HOT AND COLD WATER FROM BELOW.
2. ½" COLD WATER FROM BELOW.
3. ½" HOT AND COLD WATER UP.
4. ½" COLD WATER UP.
5. 4"Ø OVERHEAD SANITARY DOWN TO FLOOR BELOW.
6. 4"Ø SANITARY RISER FROM TOP FLOOR.
7. 4"Ø SANITARY DOWN TO UNDER SLAB.
8. ¾"Ø HOT AND COLD WATER LINES FOR TOP FLOOR.
9. 1"Ø COLD WATER FROM WATER METER ROOM.
10. PROVIDE LAUNDRY BOX WITH SANITARY, HOT AND COLD WATER OUTLETS AND WATER HAMMER ARRESTORS - OATEY MODEL QUADRO OR EQUIVALENT
11. 1"Ø H&C WATER DOWN TO FLOOR ASSEMBLY FOR KITCHEN SINK.
12. 1"Ø COLD WATER FROM UNDER SLAB FOR BASEMENT UNIT.
13. 1"Ø COLD WATER FROM UNDER SLAB FOR UPPER UNIT.

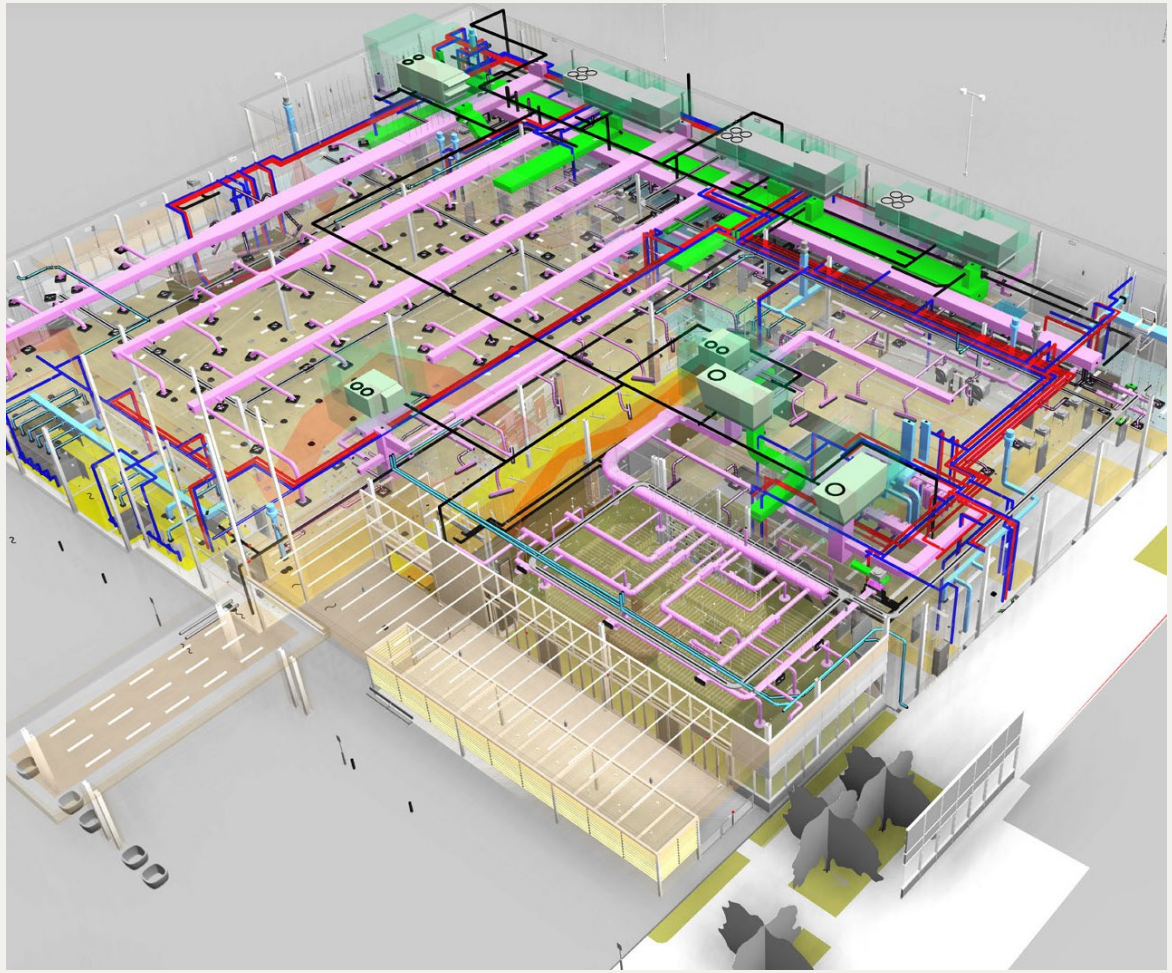
Avalon BHAG

Investment in technology to create a **repeatable approach** to building homes while **delivering an EBITDA** of $X per year with **leadership engagement** and **profit sharing**.

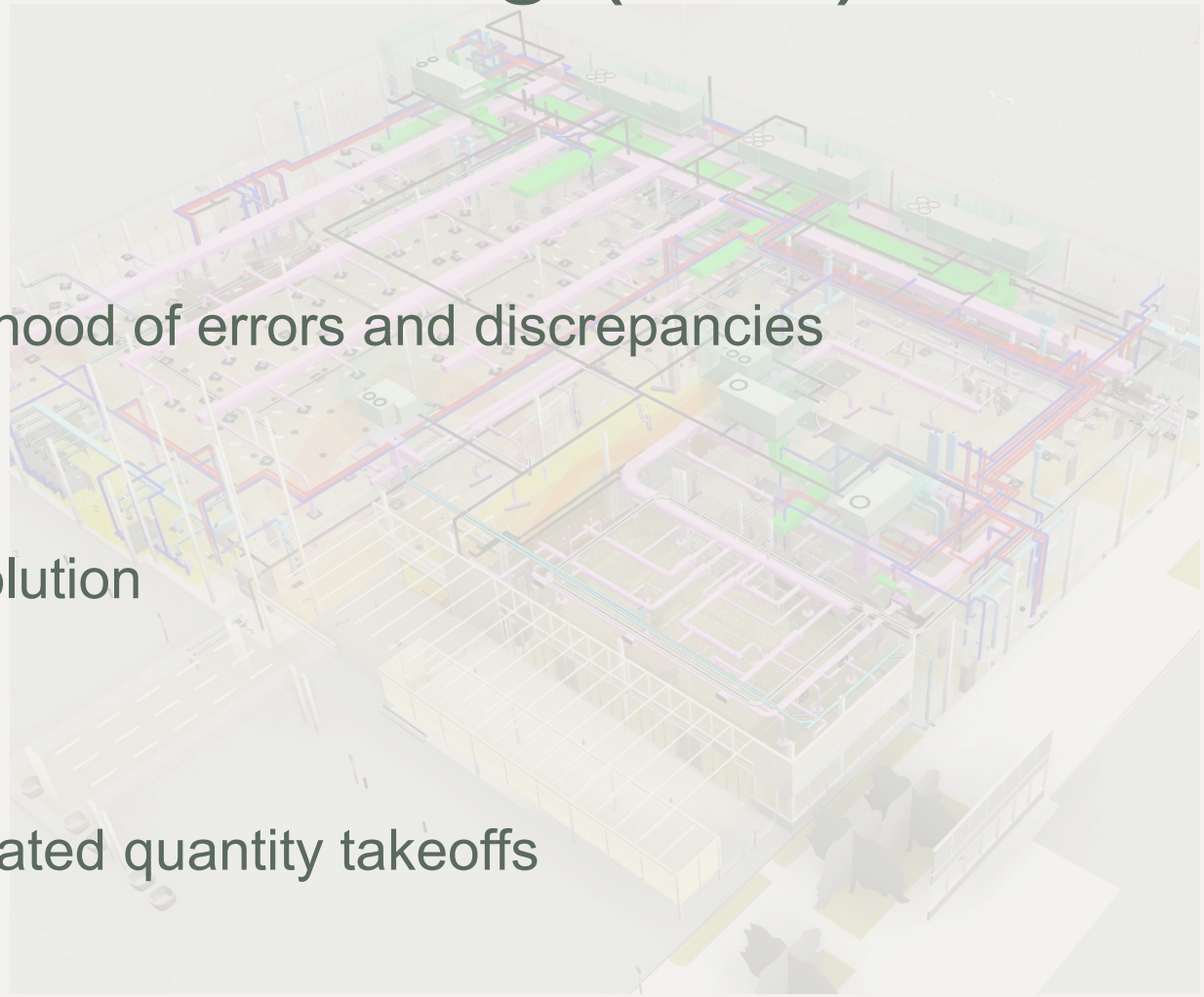
What we have determined thus far (BIM)…

Building Information Modeling (BIM) Details





Building Information Modeling (BIM) Details



Collaborative Design

- Collaboration among all stakeholders
- Centralized platform reduces the likelihood of errors and discrepancies

Spatial Coordination

- Design stage clash detection and resolution

Quantifications and Estimates

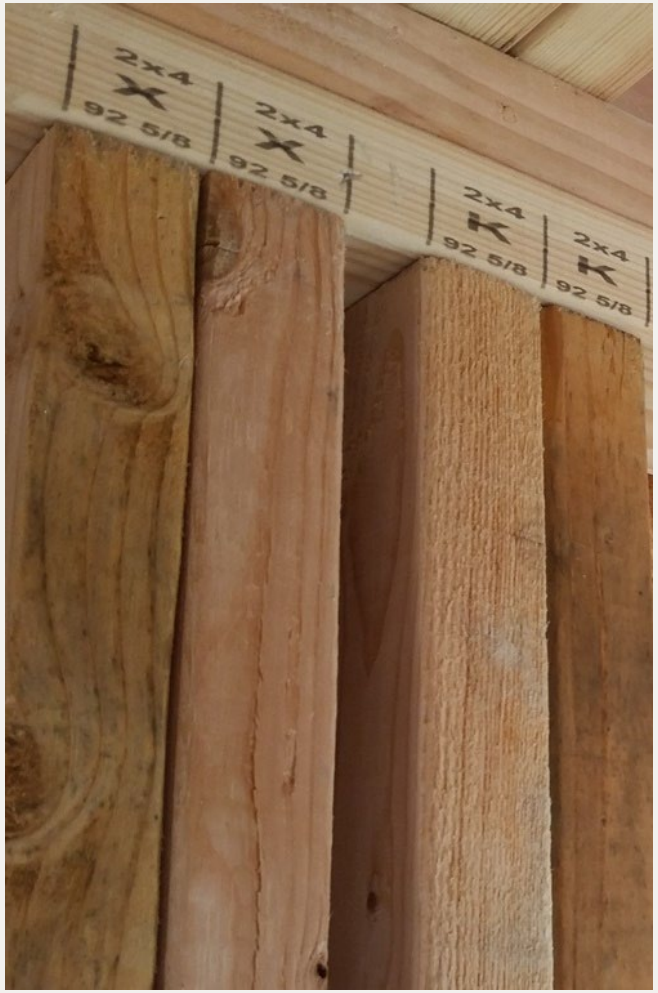
- Precise fitment of scopes allow automated quantity takeoffs

BIM – Comes with Instructions

We determine the “how to“ for framing

- Most efficient use of lumber is pre-determined
- Most efficient assembly pre-determined

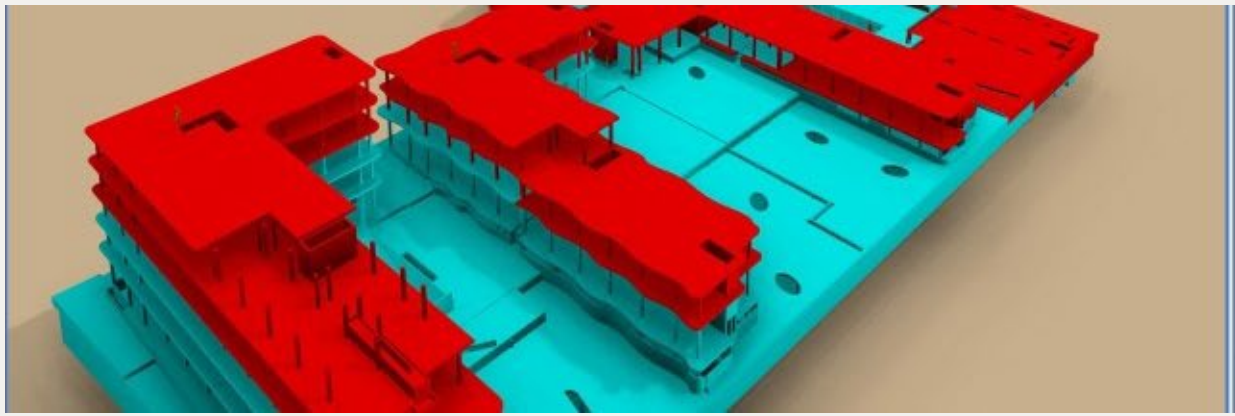
- This can extend to all scopes of work (plumbing, mechanical, drywall, etc)

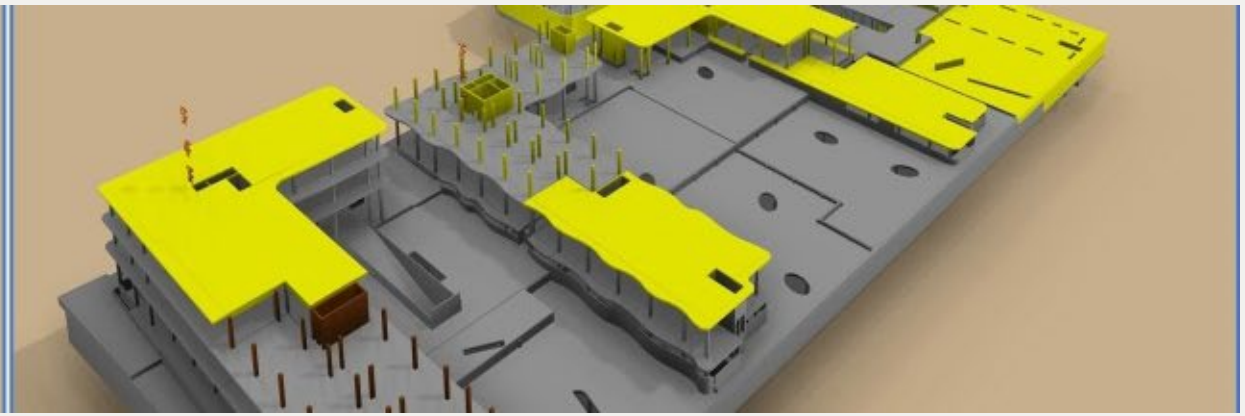


BIM + Time = 4D

Time-Based (BIM 4D) models allow visualization of construction sequencing

- Simulate and analyze different construction sequences virtually
- Identify the most efficient and cost-effective scheduling options
- Optimize resource allocation





BIM w/ Augmented Reality

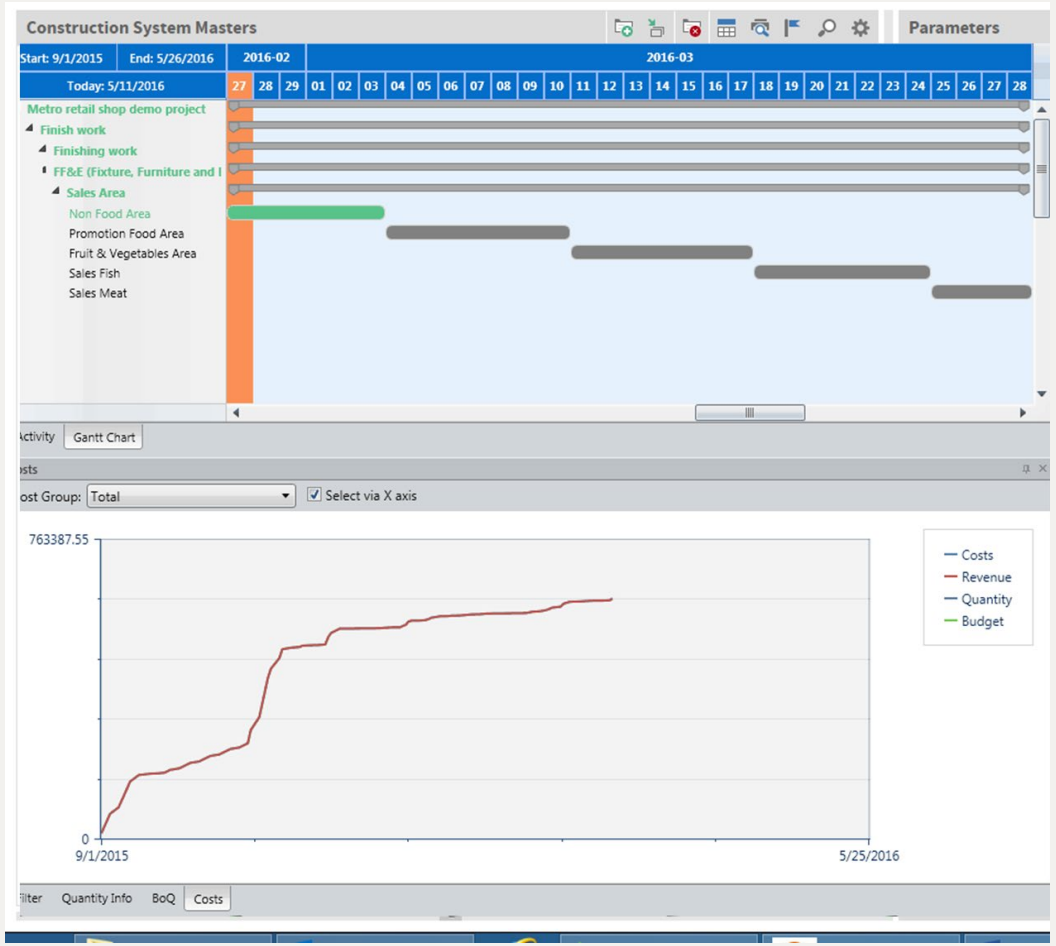
BIM data onto the physical construction site

- Allows visualization of the final construction in the real world
- Provides workers with real-time guidance
- Allows comparison of the physical construction progress against the BIM model
- Enables quick identification of deviations from the original design

BIM 4D (Time) + Cost = 5D

Integration of detailed cost information with and 4D models

- Accurate quantification of materials, labor, and other resources at each construction stage
- Real-Time cost updates as project progresses
- Detailed cash flow planning



CANADIAN HOME BUILDERS' ASSOCIATION
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LEADERSHIPSUMMIT

Neil Hawkins, Development Manager, Avalon Master Builder

2024 Net Zero Leadership Summit

CHBA Net Zero Home MURB Pilot - Avalon

Utilizing Prefabrication to improve project efficiency.

Avalon Master Builder

June 2024

Types of Pre-fab framing

Knock down wall packages

Factory built wall panels

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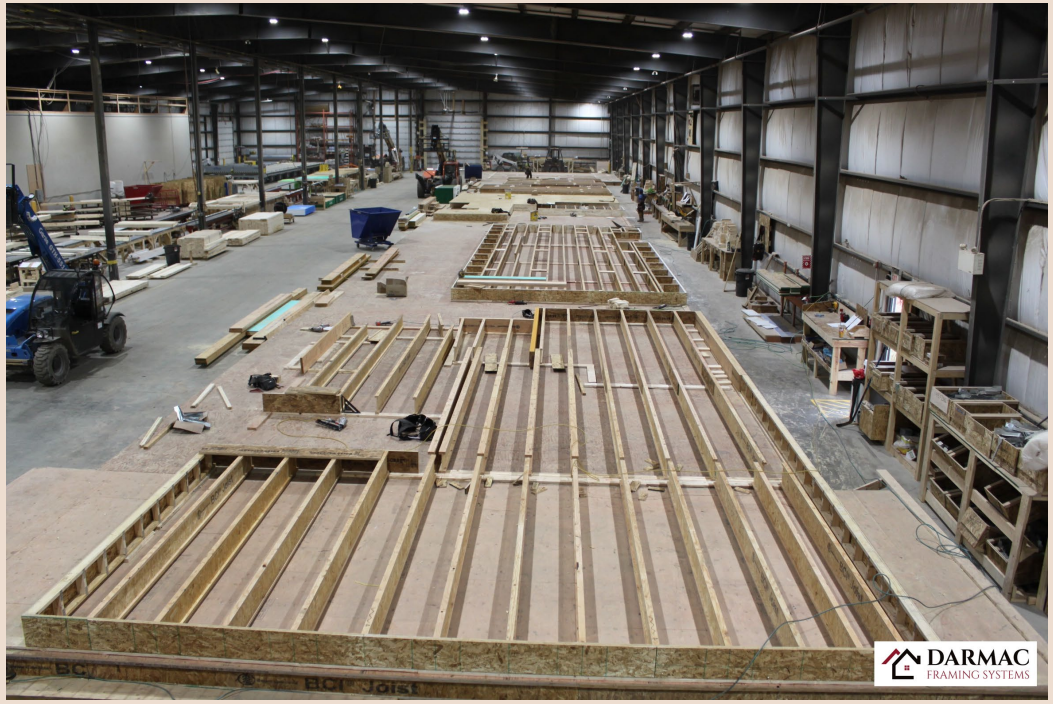
Factory installed blocking

Factory assembled floor cassettes



Factory built floor System installed on Foundation.

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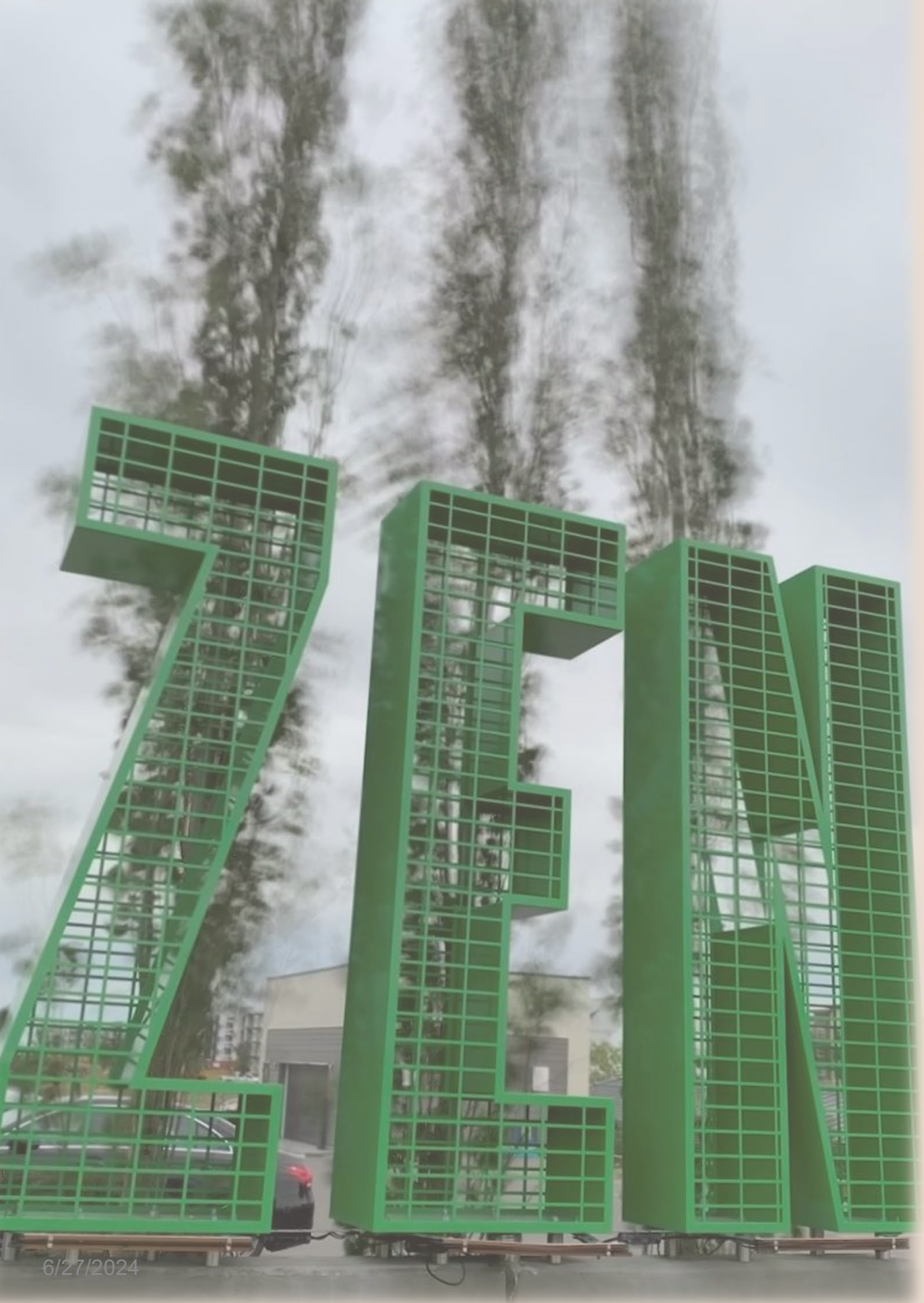
Factory production line

Wall production line

6-unit townhome block
Three weeks to complete on-site work



Thank you!

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