



# Sustainable & Affordable Housing by Element5

Prefabricated, panelized building solutions to address the urgent housing needs of vulnerable Canadians





# Meet the Sustainable Affordable Housing Solution

Our multi-unit residential, pre-engineered mass timber structures are designed and optimized to be:

1. Affordable
2. Rapid
3. Durable and secure
4. Healthy



Architectural design and renderings supplied by Edge Architects



# Building Features

“Modular is defined as housing units that are partially or fully built off-site (e.g. a factory, warehouse, or similar facility) by a qualified manufacturer and delivered to the site in whole or in parts and installed on an appropriately zoned and serviced lot. This may range from single, scattered units up to larger multi-unit housing projects.”

- Rapid Housing Initiative.



## Affordable

The optimized CLT design incorporates manufacturing efficiencies that help drive down cost. Furthermore, the use of prefabricated mass timber components helps reduce the construction schedule which can generate significant cost savings over a strictly site-built project.



## Rapid

Site-built projects can be subject to weather delays, coordination issues, skilled local labour shortages, and other disruptions. In factory-built projects, timelines are compressed, with site preparation and fabrication often happening concurrently. Components are shipped in sequence for quick assembly.



## Durable & Secure

Mass timber residential buildings are pre-engineered to meet or exceed building code, fire code, acoustic, and envelope performance requirements. This efficient, safe, and durable construction method delivers buildings that enhance occupant comfort and provide long-term value for building owners.



## Healthy

People naturally respond to a warm, welcoming wood building. New research in the field of building science shows that this response is more than just a feeling. Incorporating wood and other natural elements into our buildings can directly contribute to the health and well-being of building occupants.





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## Sustainable

Wood is a natural, renewable, and sustainable construction material with a lighter carbon footprint than steel or concrete. Prefabricated mass timber offers enhanced sustainability by increasing performance and minimizing waste. We use sustainably sourced Ontario wood to manufacture our products.



## Customizable

Designed for manufacture and assembly, the optimized CLT structural grid presented in this solution is easily modifiable. No building is too big or small. It can be modified not only to offer alternative unit sizes, but also to meet the unique site, size, and height requirements, within certain parameters.



## Energy Efficient

The superior quality control of the factory means a site assembled building performs better than a site built one. Our CLIPs envelope solution exceeds the energy efficiency standards of the 2015 National Energy Code for Buildings and can be customized to achieve any standard, even Passive House.



## Construction Safe

In off-site construction, the controlled indoor setting makes the most efficient use of labour resources and greatly improves worker health and safety. There is a reduced need for working at heights, and the warm, well-lit, dry environment reduces the risk of slips, trips, and falls.

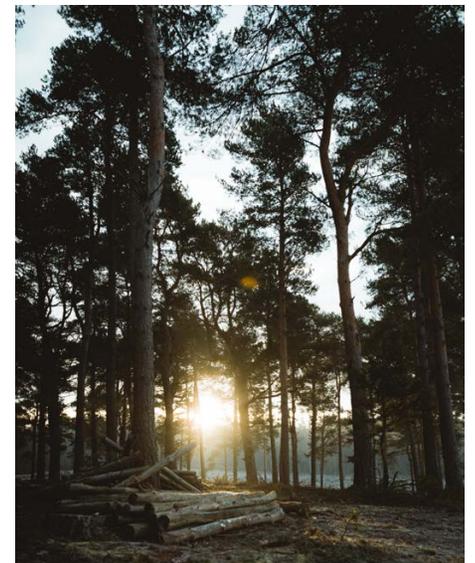
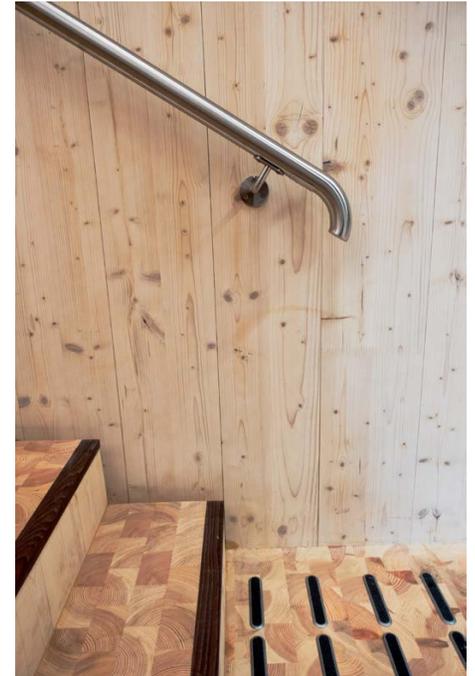
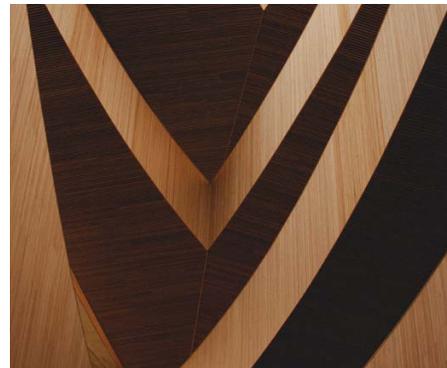


# Why Wood?

- 
- **Healthy**
  - **Sustainable**
  - **Locally Sourced**
  - **Strong**
  - **Safe**
  - **Energy-Efficient**
  - **Affordable**
  - **Adaptable**
  - **Accessible**
- 

The materials used to build, renovate, and maintain structures have a significant effect on people and the environment, so it is important to thoughtfully consider the full impact of each. From extraction through processing to finished components and final assembly, wood is the only building material that offers positive environmental outcomes. It is also the only material demonstrated to contribute to the health of building occupants.

Projects that incorporate sustainably sourced wood products help reduce the carbon footprint of our built environment. As we face the reality of climate change and the impact of human development, it is clear that building with wood isn't just a more responsible choice; it is a necessary one. Using wood in the new ways made possible through advanced manufacturing and computer-aided design has ensured that today's wood buildings are not only sustainable; they're also smarter, stronger, and more versatile.



From left to right: Photos by Alexandre Jacquetoni, Anders Vestergaard Jensen, Filip Zrnzevic, Ben Den Engelsen and Annie Spratt on Unsplash.



# Our carbon impact (or lack thereof ) speaks for itself.

## VOLUME OF WOOD PRODUCTS USED IS

**683** cubic meters

## U.S AND CANADIAN FORESTS GROW THIS MUCH WOOD IN

**2** minutes

## CARBON STORED IN THE WOOD

**527** metric tons of  
carbon dioxide

## AVOIDED GREENHOUSE GAS EMISSIONS

**204** metric tons of  
carbon dioxide

## TOTAL POTENTIAL CARBON BENEFIT

**730** metric tons of  
carbon dioxide

## THIS IS EQUIVALENT TO

**154** cars off the  
road for a year

OR

## THE ENERGY TO OPERATE

**77** homes for a year

Results from this tool are based on wood volumes only and are estimates of carbon stored within wood products and avoided emissions resulting from the substitution of wood products for non-wood products in this specific 4-storey, 40-unit residential example. The results do not indicate a carbon footprint or global warming potential and are not intended to replace a detailed life cycle assessment (LCA) study. Please refer to the References and Notes for assumptions and other information related to the calculations which can be found on the Canadian Wood Council's website at:

<https://cwc.ca/design-tools/carbon-calculator>

| Photo by © Craig Heinrich

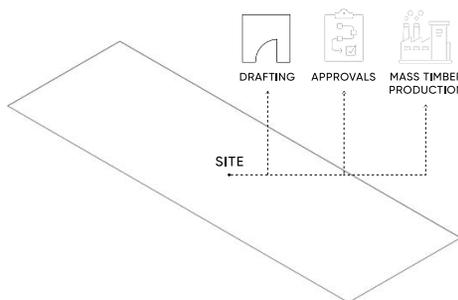


# The Process

01

## Planning and Approvals

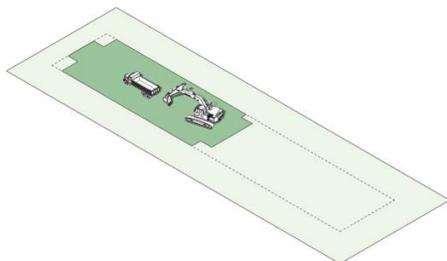
Architectural plans are adapted to the chosen site and submitted for any municipal approvals and permits. Element5 develops shop drawings and begins manufacturing the structural components in their factory.



02

## Site Work Begins

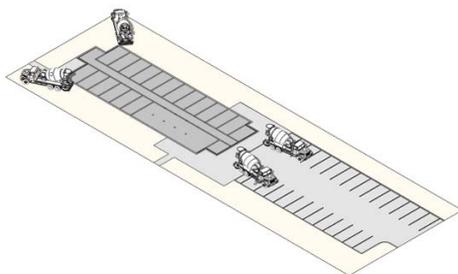
Once plans are approved, site work and grading can commence. Meanwhile, production continues on the structural components off-site at the Element5 factory.



03

## Foundation

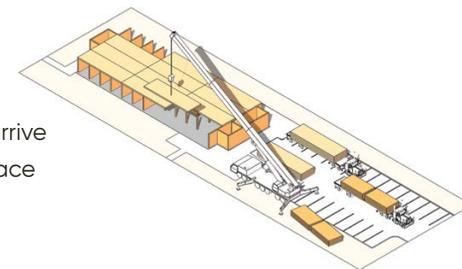
Foundations are poured on-site.



04

## Super Structure

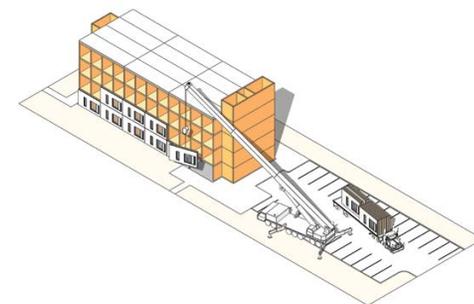
Modular wall, floor, and roof panels arrive on-site. They are then craned into place to create the super structure.



05

## Envelope Panels

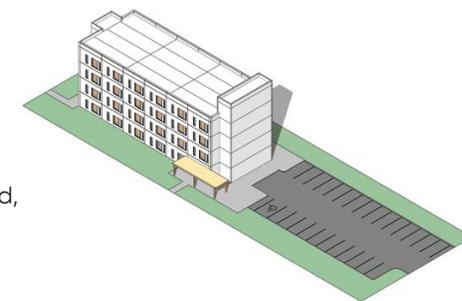
Modular, prefabricated exterior wall panels arrive on-site. They are then craned into place to quickly enclose the building.



06

## Completion

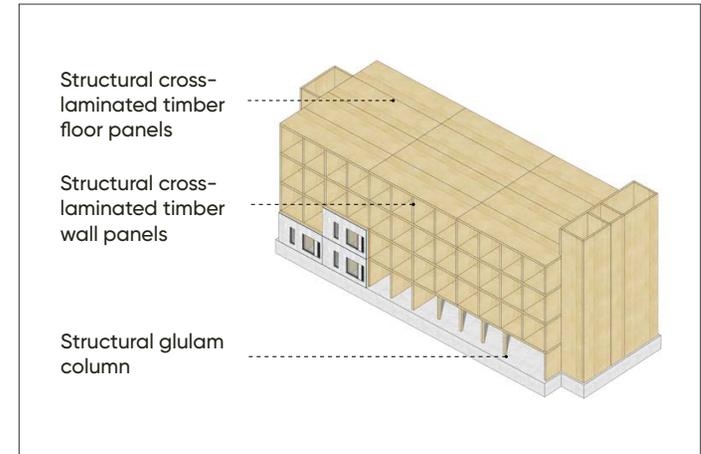
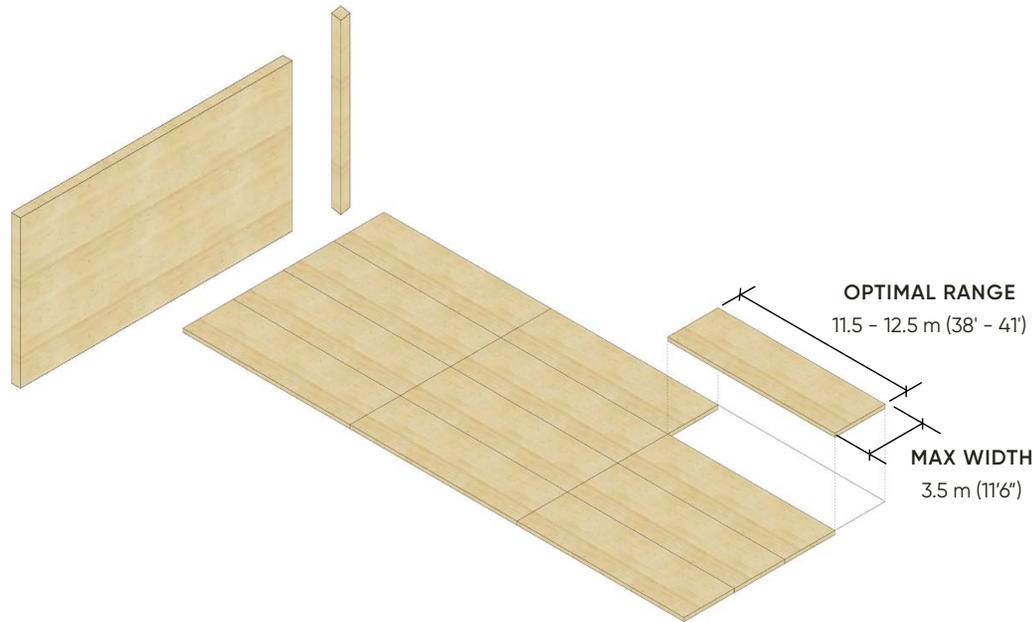
Once the envelope has been installed, the interior can be completed. Final landscaping and other site work is completed simultaneously.



Architectural design and diagram supplied by Edge Architects



# Flexible Structural Layout



Architectural design and diagram supplied by Edge Architects

## CLT FLOOR - OPTION 1 (WET APPLIED SYSTEM)

- Vinyl plank flooring
- Thick rubber mat (insonofloor)
- Lightweight concrete (Ecomix)
- Rubber mat (insonofloor)
- CLT floor panel
- \* 1-hour fire rating

### STC RATING



## CLT FLOOR - OPTION 2 (DRY APPLIED SYSTEM)

- Vinyl plank flooring
- Plywood or OSB (Installed at 45°)
- Plywood or OSB
- CLT floor panel (with factory installed AcoustiTech sofix mat)
- \* 1-hour fire rating

### STC RATING



## CLT Partition 1 (Suite demising walls)

- Type X gypsum board
- Resilient metal channel
- CLT panel
- Wood stud
- Mineral wool
- Type X gypsum board
- \* 1-hour fire rating

### STC RATING



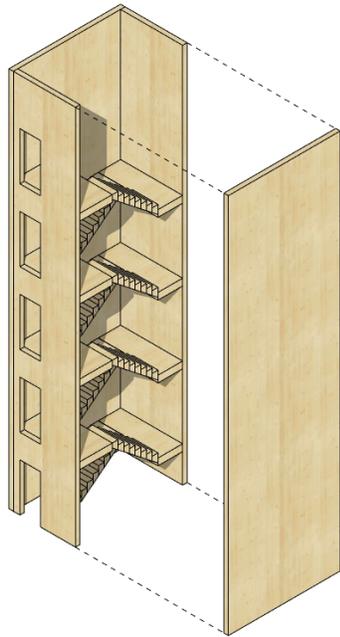
## CLT Partition 2 (Suite demising walls adjacent to elevators)

- 16mm type X gypsum board
- Mineral wool
- Wood stud
- CLT panel
- Wood stud
- Mineral wool
- Type X gypsum board
- \* 1-hour fire rating

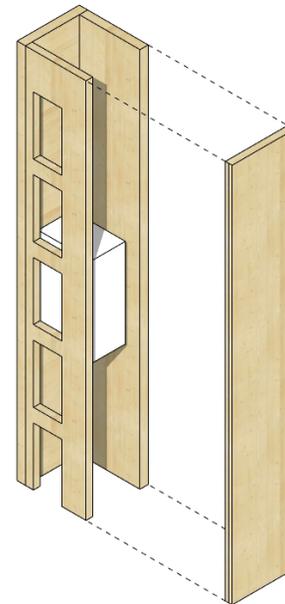
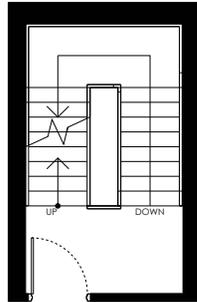
### STC RATING



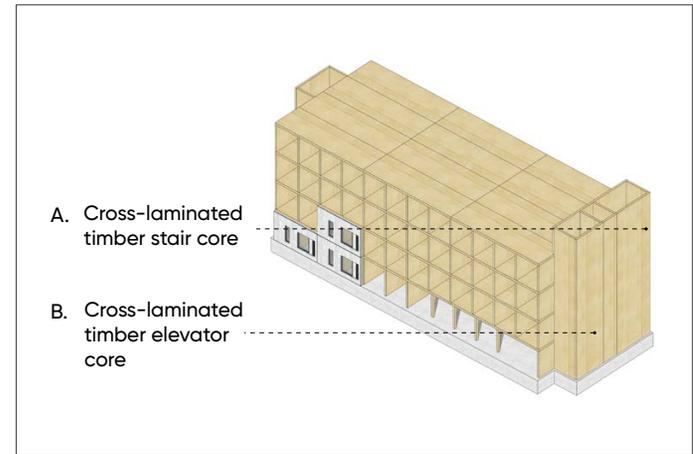
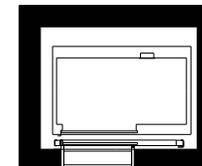
# Vertical Circulation



A. Cross-laminated timber stair core



B. Cross-laminated timber elevator core



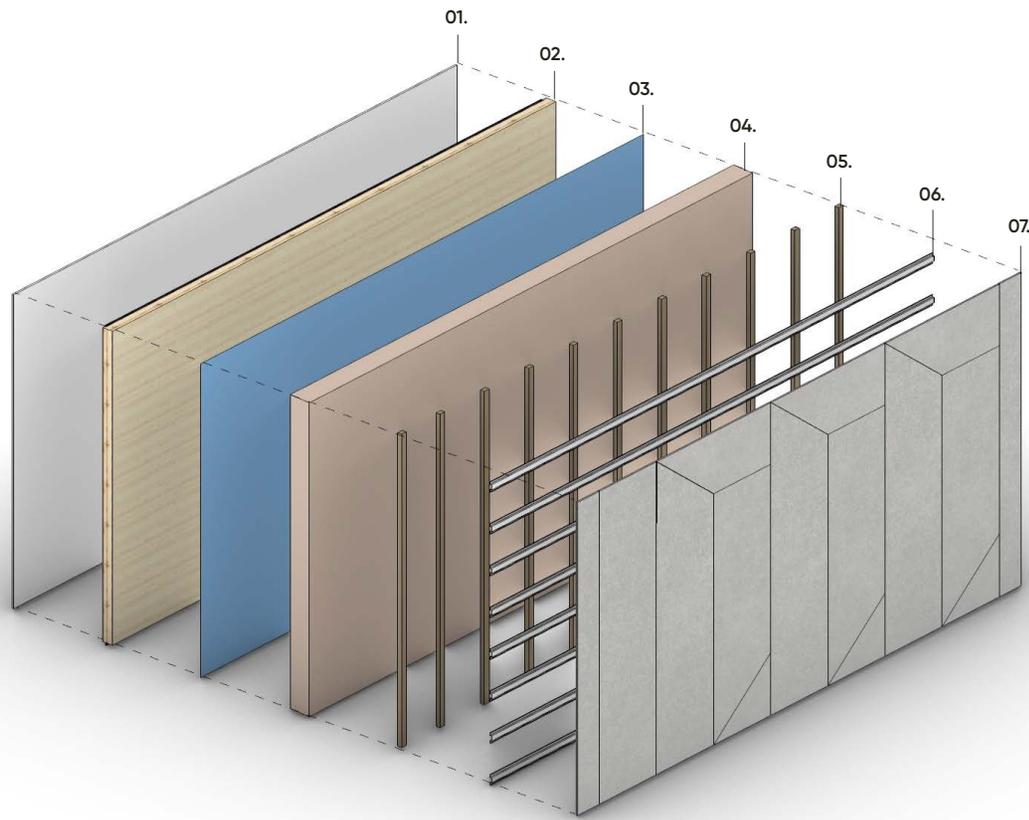
A. Cross-laminated timber stair core

B. Cross-laminated timber elevator core



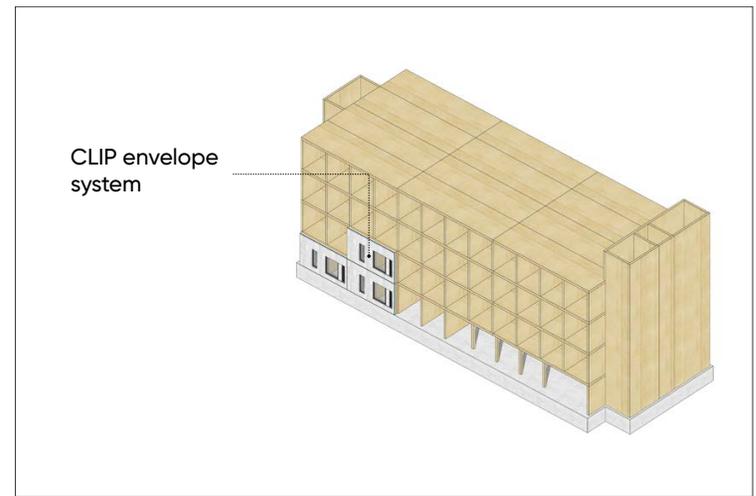
# Envelope and Cladding

## Cross-Laminated Insulated Panels (CLIPs)



- 01.** Interior Cladding (Fire Protection)
- 02.** CLT Panel (Structure + Airtight Layer)
- 03.** Vapour Permeable Membrane (Moisture Control)
- 04.** Insulation (Thermal Layer)
- 05.** Battens (Ventilation Layer)
- 06.** Horizontal Channel (Cladding Attachment)
- 07.** Cladding (Protective Layer + Aesthetics)

| CLIP panel diagram supplied by Element 5



| Architectural design and diagram supplied by Edge Architects

**RAIN-SCREEN SYSTEM INSTALLED IN FACTORY**



Phenolic panels



Fiber cement



Aluminum composite panels steel siding

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**SITE APPLIED**



Stone



Brick



Stucco



## SERVICES OFFERED

# More than just a building. Comprehensive professional services are part of the total solution.

The quick turnaround required for projects delivered under the Rapid Housing Initiative leaves you little time to assemble the skilled team needed to successfully deliver a project under a compressed schedule.

To simplify the process, the members of our specialist 'mass timber team' are available to consult on your project as part of the total package.

### Disciplines covered include:

#### Architecture

Functional programming, site and building space planning, 3d massing, suite layout design, renderings and coordination of planning approvals and building permits

#### Consulting

Cost, building code, fire, envelope, and acoustic consulting

#### Planning

Official Plan and zoning analysis, site plan review, approvals coordination, urban design compliance and landscape architecture.

#### Engineering

Structural, civil, mechanical, and electrical engineering



## WHO IS ELEMENT5?

We create innovative, sustainable, high-performance modular buildings to meet your affordable housing needs.

We believe innovative wood systems accelerate the adoption of mass timber construction and greatly improve the built environment.

Element5 is a rapidly growing fabricator and off-site manufacturing company committed to using sustainably sourced lumber to produce high-performance components and buildings.



### Fabrication Excellence

We are Canada's newest and most technologically advanced mass timber manufacturer.

### Turnkey Professional Services

We offer a fully integrated suite of professional services and products as a single-point solution for the design, supply, and construction of mass timber structures.

### Commitment to Sustainability

We take pride in using FSC-certified Ontario lumber inputs to manufacture our mass timber products for use in high-performance wood buildings.

### Investment in Innovation

We invest in the development of innovative, value-added mass timber components.





#### WHAT WE DO

Prefabricated, panelized building solutions to address the urgent housing needs of vulnerable Canadians, through the rapid construction of sustainable, affordable housing.

Collectively, the construction, maintenance, and demolition of the built environment is a leading source of the world's carbon dioxide (CO<sub>2</sub>) emissions. In the face of climate change, exponential population growth, and the affordable housing crisis, prefabricated mass timber solutions offer a truly sustainable alternative to more carbon-intensive construction practices.

Architectural design and rendering supplied by Edge Architects



Thank you for your interest in Element5.

We welcome the opportunity to answer any questions you may have about our products, services, or the design and development of sustainable mass timber housing that can be delivered quickly to meet the needs of housing providers and the people they serve.

**CONTACT US TODAY**

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Patrick Chouinard

Founder & VP Business Development

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[elementfive.co](https://elementfive.co)