

Tall Timber, Deep Roots: The Chief Leonard George Building

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WoodWorks | The Wood Products Council

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



Course Description

This session explores the Chief Leonard George Building—Canada's first mixed-use tall mass timber Passive House project—and how the architectural, structural engineering, and building enclosure teams coordinated its design and construction. Attendees will examine how a prefabricated mass timber structure, mass timber envelope panels, and high-performance Passive House strategies were coordinated to create a safe, durable, energy-efficient, and culturally responsive building.

Topics include the tall timber structural system, integration of prefabricated enclosure components, and the building science principles used to support thermal performance, airtightness, moisture control, indoor air quality, and occupant comfort. Presenters will also discuss how robotic premanufacturing and coordinated off-site fabrication reduced construction waste, site traffic, noise, and installation risk while improving dimensional accuracy and construction efficiency.

Learning Objectives

1. Describe how the structural, architectural, and building enclosure systems of a tall mass timber building can be integrated to meet life-safety, durability, and building performance requirements.
2. Evaluate Passive House design strategies for airtightness, thermal continuity, moisture management, indoor air quality, and occupant comfort in a mixed-use mass timber building.
3. Identify how prefabrication, robotic manufacturing, and coordinated installation planning can improve construction accuracy, reduce site impacts, and mitigate risks associated with tall mass timber construction.
4. Apply lessons from the Chief Leonard George Building to the planning and design of code-compliant tall mass timber projects that support structural safety, enclosure resilience, environmental performance, cultural responsiveness, and occupant well-being.



Tall Timber, Deep Roots

The Chief Leonard
George Building

gbl
ARCHITECTS

RDH BUILDING
SCIENCE

Fast+Epp



Chief Leonard
George Building



GRANDVIEW
WOODLAND

1766 Frances Street Fire

Dec 2017

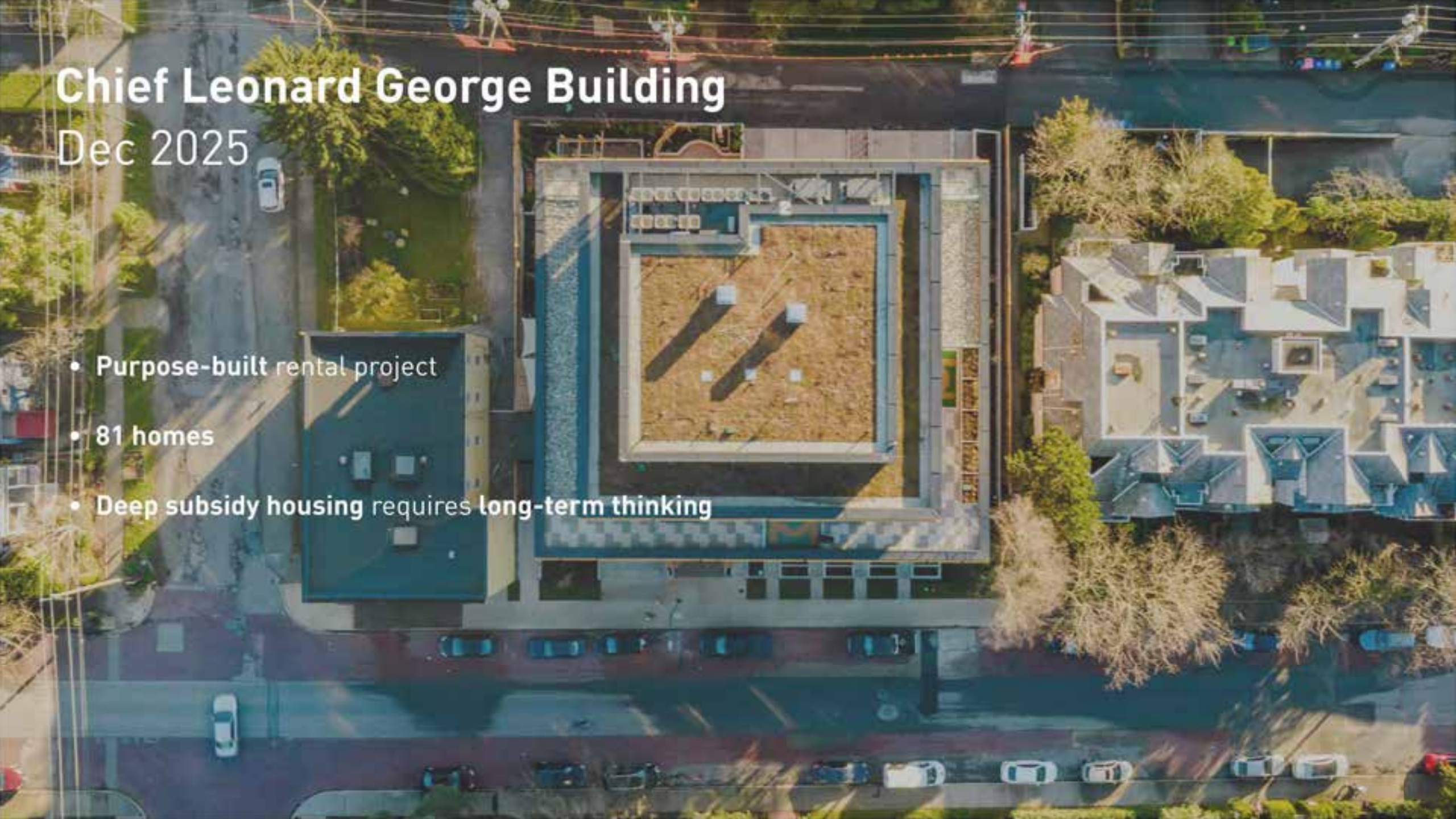
- Significant fire in a VNHS family building
- Residents evacuated safely
- VNHS reported ~50 tenants displaced
- Temporary lodging was arranged with Emergency Support Services

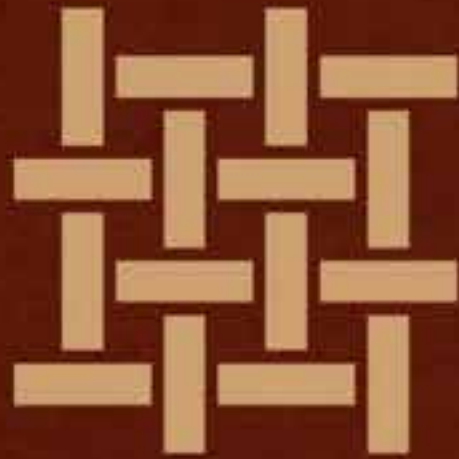


Chief Leonard George Building

Dec 2025

- Purpose-built rental project
- 81 homes
- Deep subsidy housing requires long-term thinking





- 1. Cultural Relevance**
- 2. Community Healing**
- 3. Technological Innovation**
- 4. Environmental Stewardship**

Cultural Relevance



Inspiration

- Façade inspired by **Coast Salish woven basketry**
- Symbolizes **community, resilience, women's leadership**
- Rooted in Indigenous principles and **teachings**



Contemporary Basket

- Holding families and **culture**
- A place that feels like **home**
- Symbol of **craftmanship, care** and **cultural continuity**



Community Healing

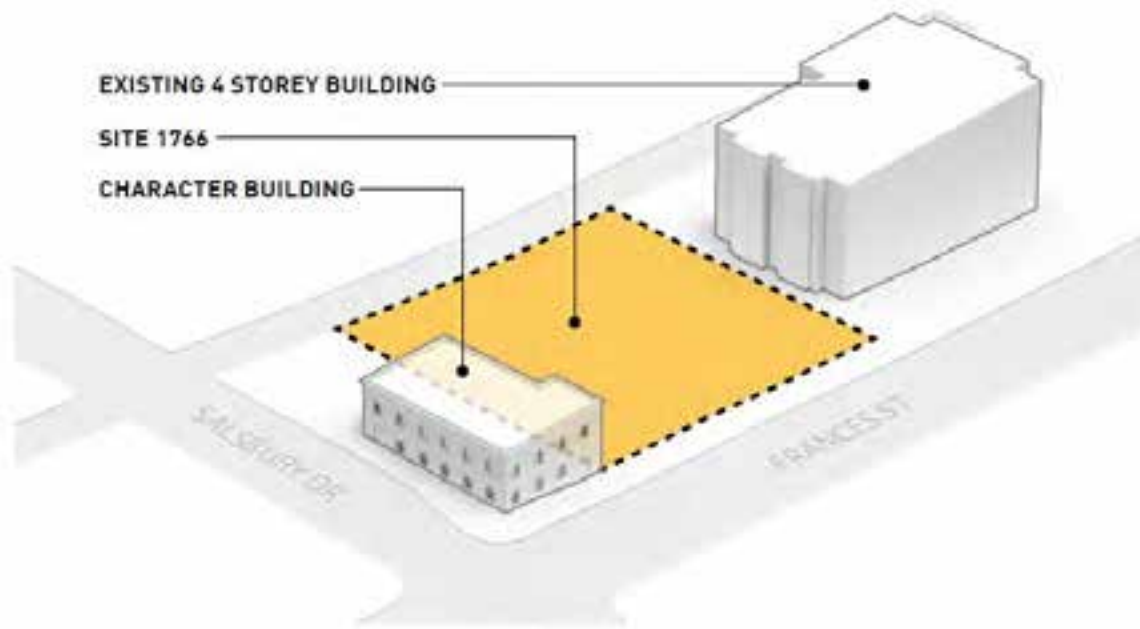


Neighbourhood Identity

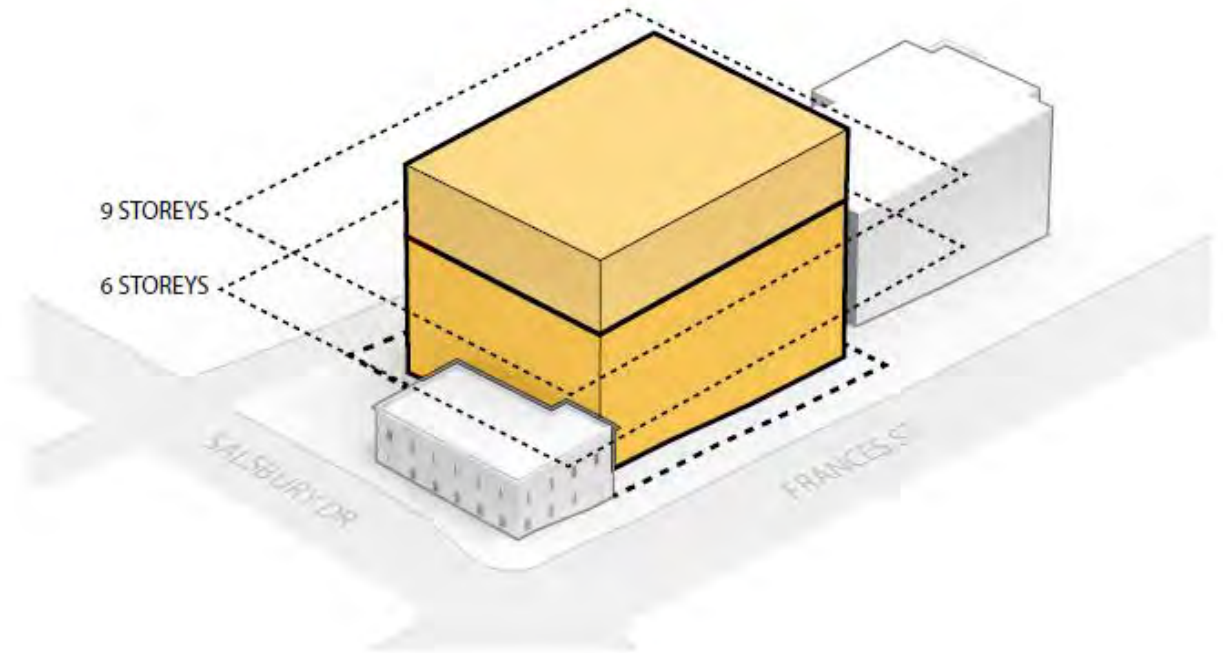
- Replaces a **fire-damaged** building
- Restores homes and **sense of belonging**
- Revitalizing the **urban block**



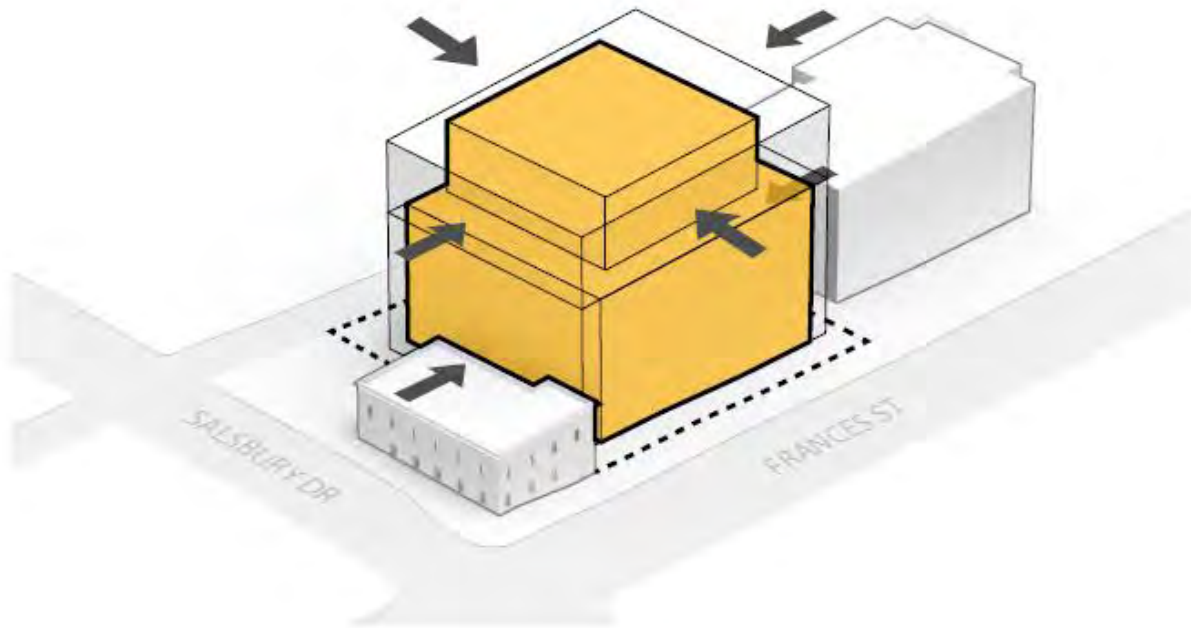
1. EXISTING SITE



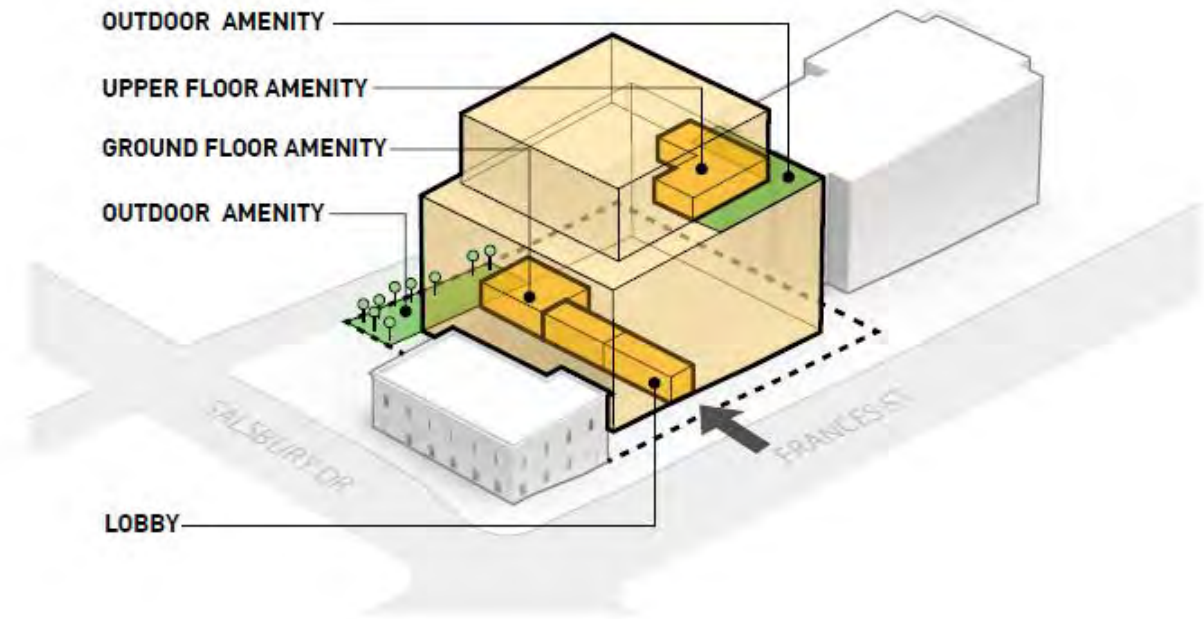
2. HEIGHT



3. MASSING



4. AMENITIES



Amenities and Childcare

- Amenity spaces designed for **storytelling** and Indigenous workshops.
- Childcare space giving children opportunity to learn about their **language and culture**.
- Landscape includes **edible** and **medicinal** gardening



Intergenerational Living



- Designed for **Indigenous families &** singles
- Mix of **four-bedroom** apartments and **studios**

Technological Innovation



Off-Site Fabrication



Neighbourhood Impact



Environmental Stewardship



Mass Timber

- Point supported, **cross-laminated timber** floor panels
- Massing and dwelling unit design **optimized** for structural grid
- Designed to allow for flexibility



Passive House



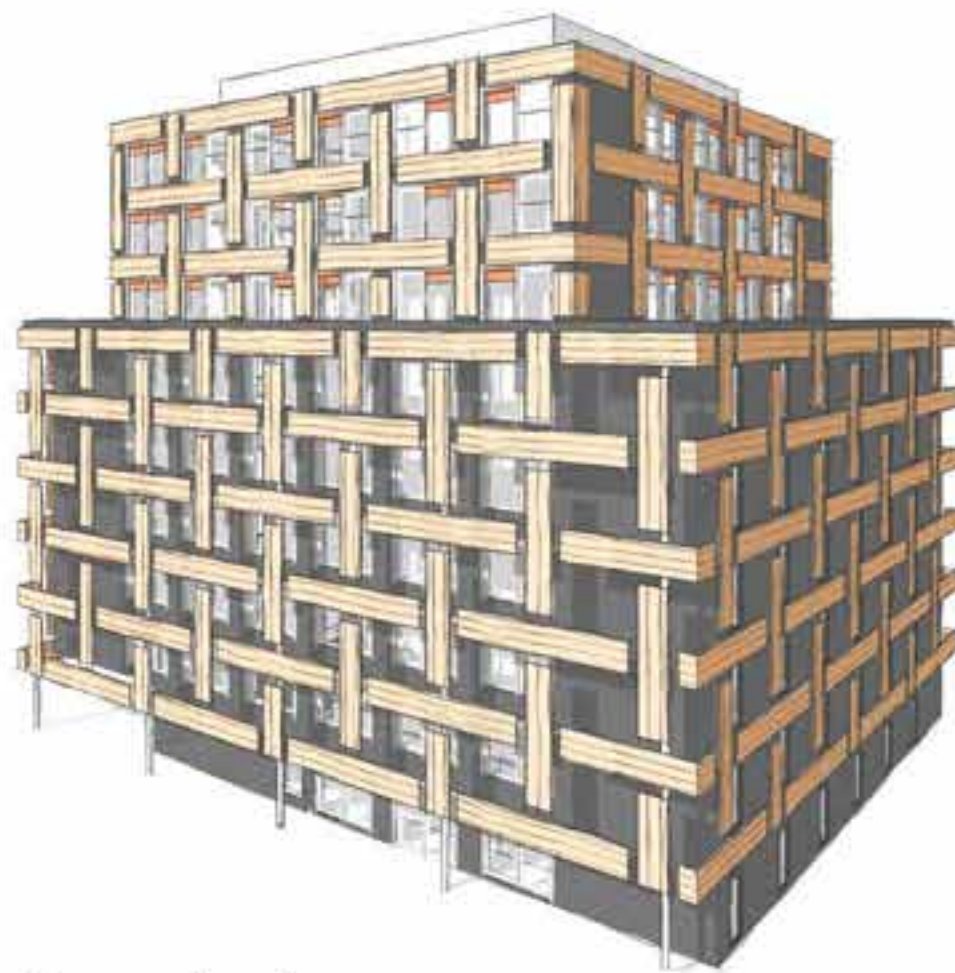
South



North



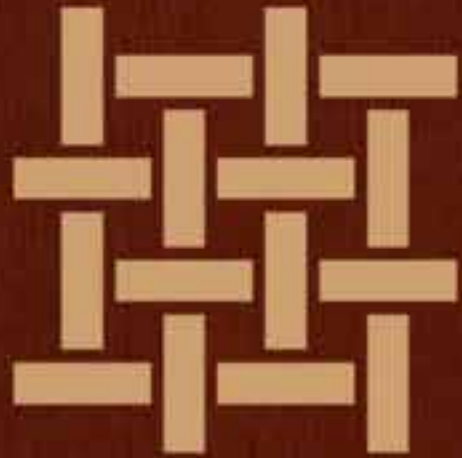
Embodied



Operational

a model for the future?





1. Point-Supported CLT

2. CLG Structure and Construction

Point Supported CLT Construction

1

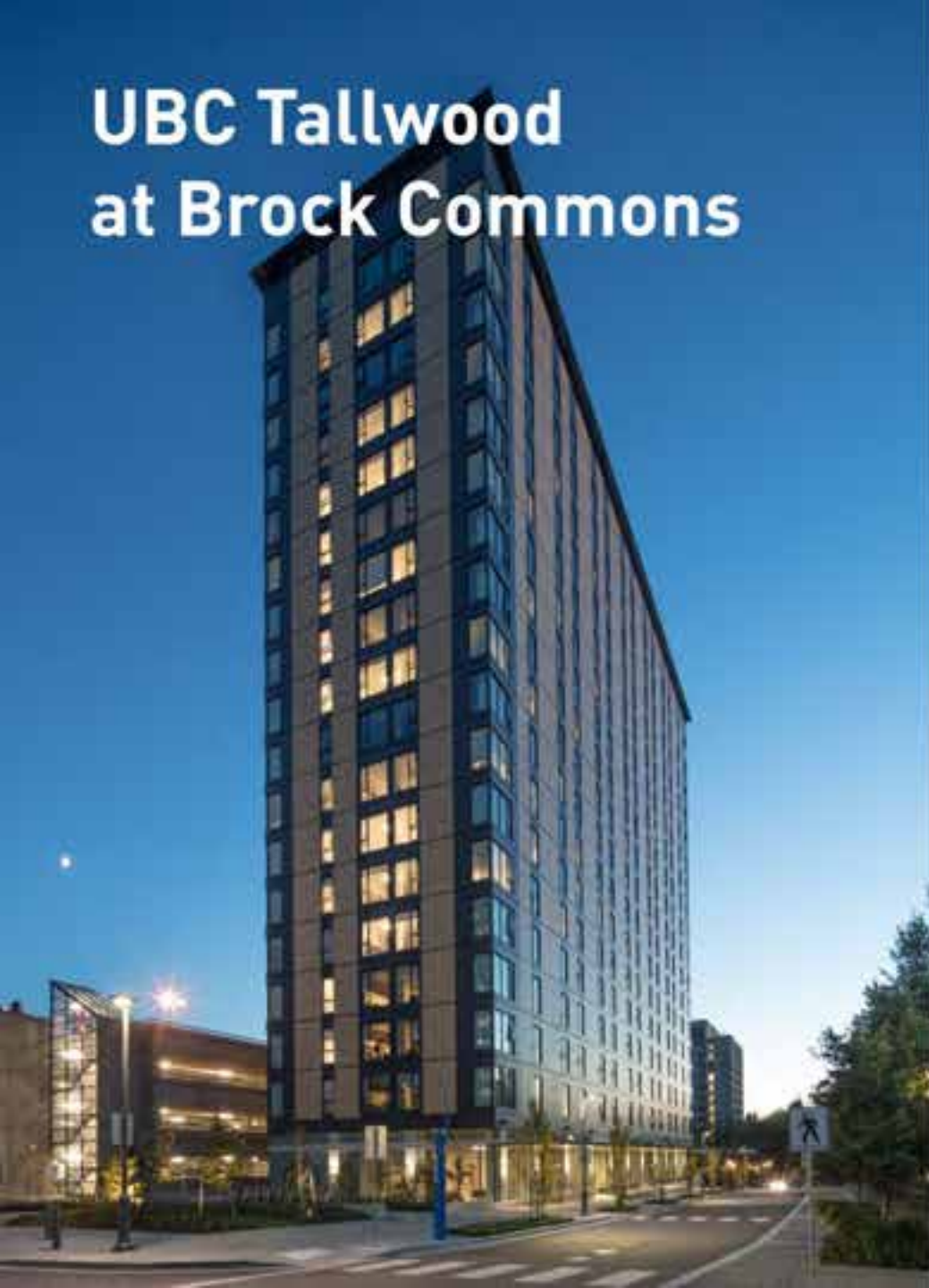


Point-Supported CLT In British Columbia

- Prefabrication of CLT panels speeds up installation, easier on-site assembly
- No beams = reduced total floor depth
- Layout modularity makes it ideal for student and social housing



UBC Tallwood at Brock Commons



- Tallest timber building in the world at the time of completion
- 17-storeys, two concrete cores
- Complete four months faster than a typical project of this size



- 12-storeys
- Steel concentrically braced frame modular cores
- CLT floors supported on steel HSS columns

BCIT Tall Timber Student Housing



Vancouver Island University Student Housing



- 10-storey hybrid mass-timber
- Six-storey timber structure above a four-storey concrete podium
- Three concrete cores



- 17-storey
- One concrete core
- Prefabricated panelized exterior walls

981 Davie



Chief Leonard George Structural System & Installation

2

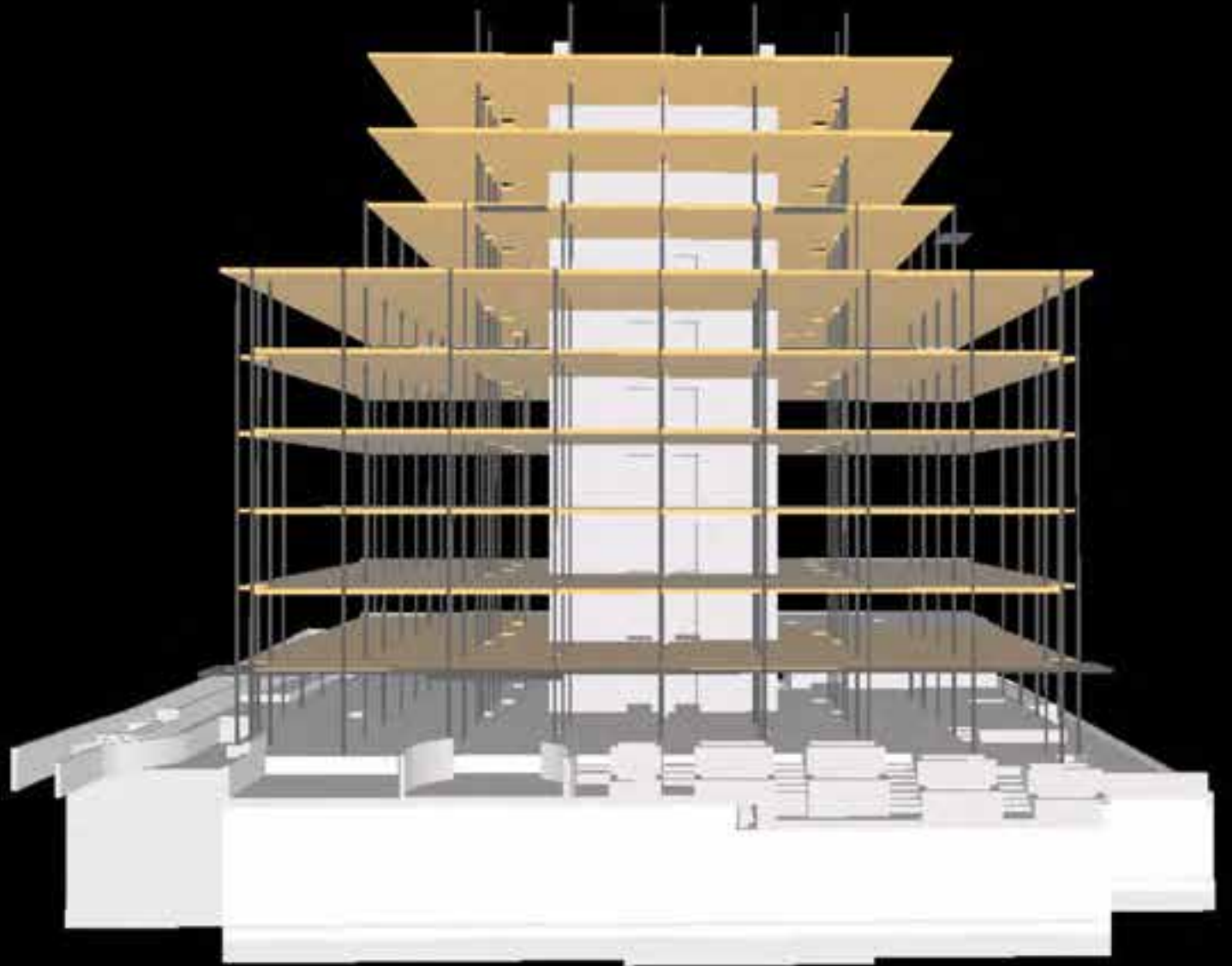




Lateral System

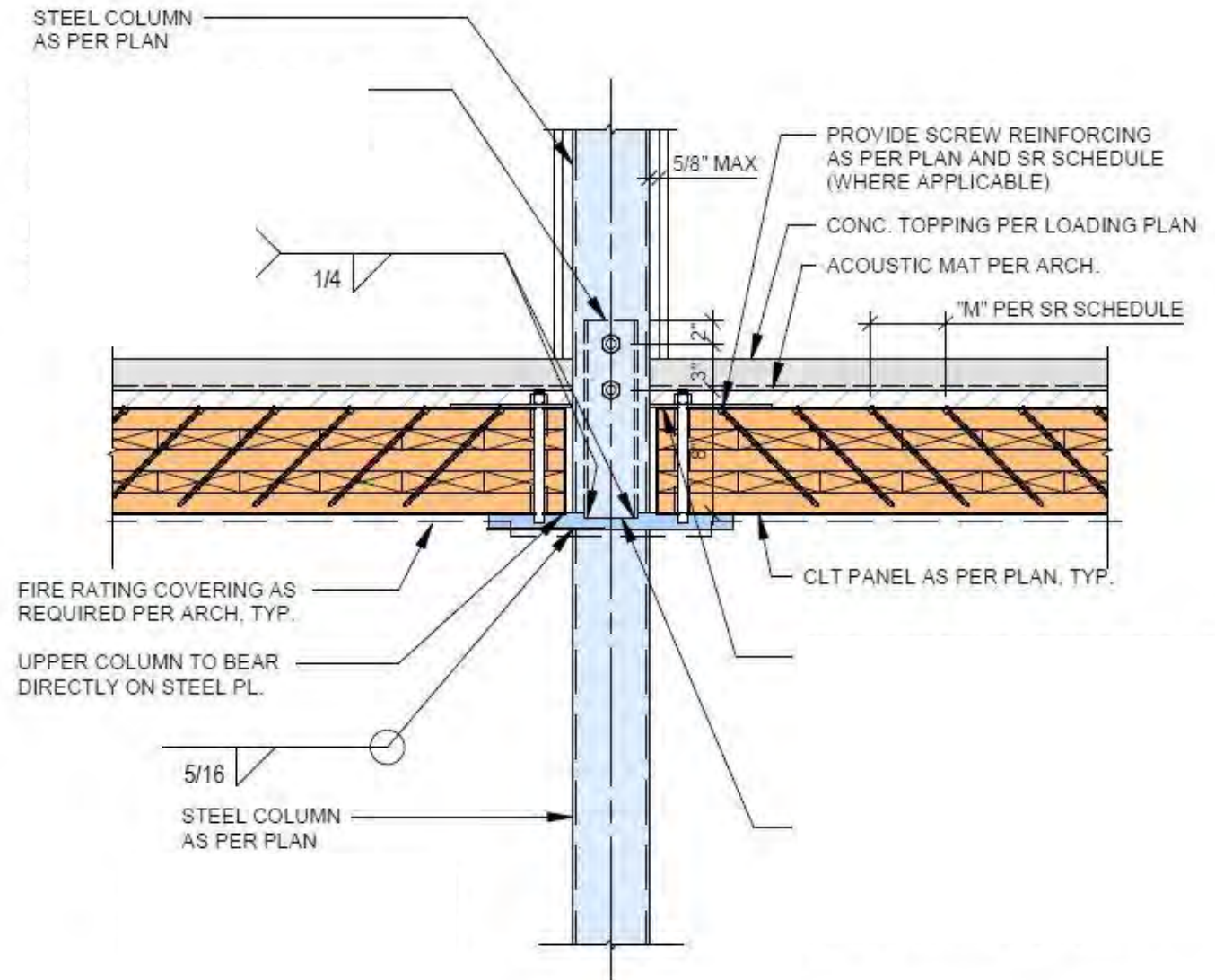


Gravity System



Point-Supported CLT Testing

- 300+ tests
- Assessed punching shear capacity of CLT
- Multiple species & layups
- Funded by NRCAN

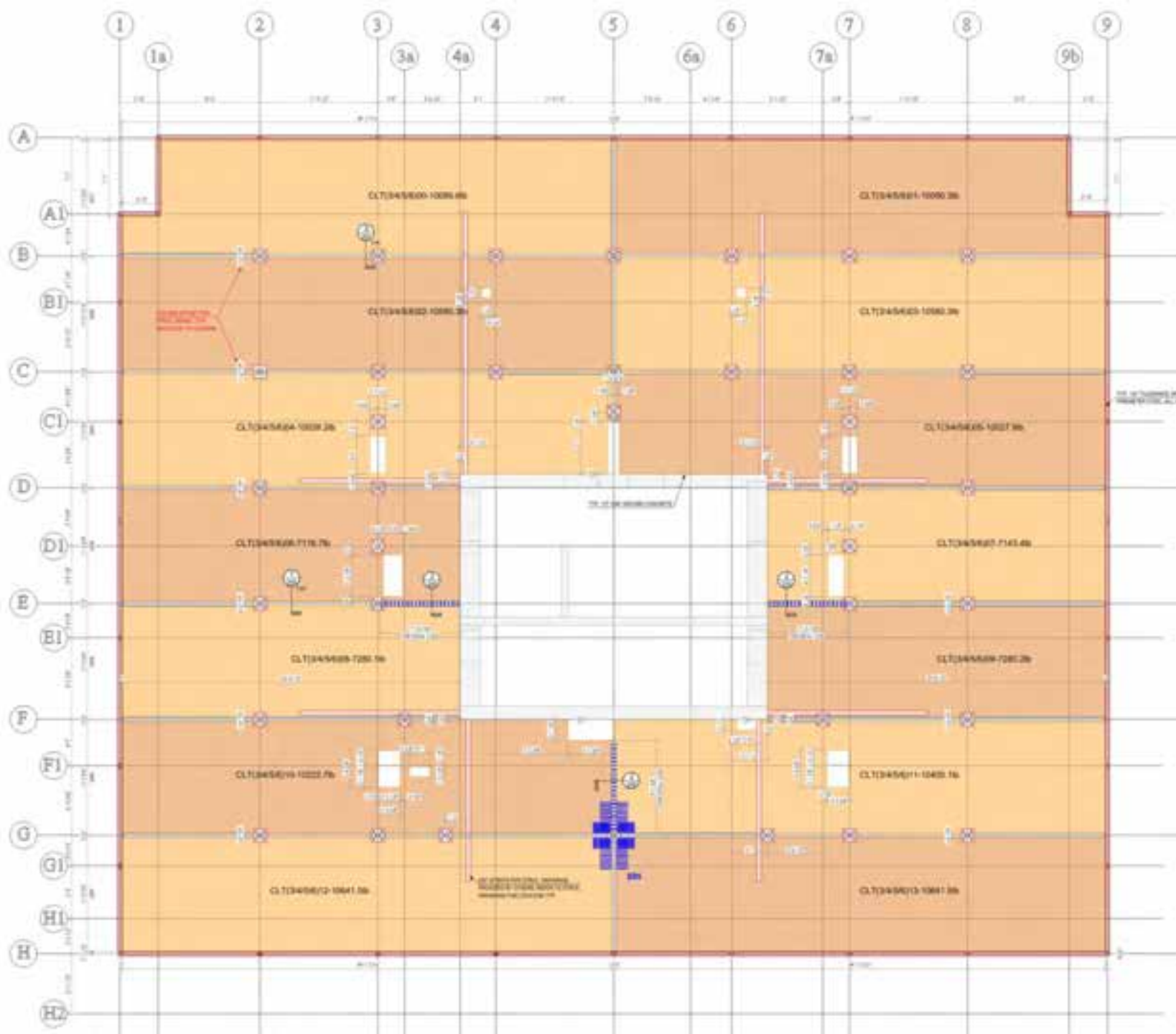


TYPICAL STEEL COLUMN TO CLT SLAB

1" = 1'-0"



S3.1









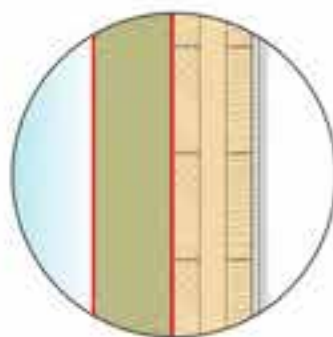




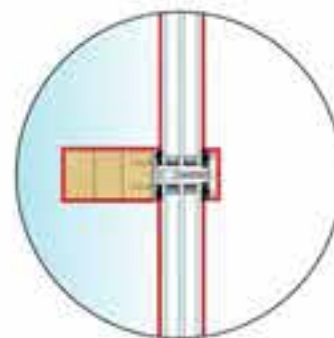


- 1. Passive House Principles**
- 2. Energy & Carbon**
- 3. Prefabrication**
- 4. Chief Leonard George Panel**

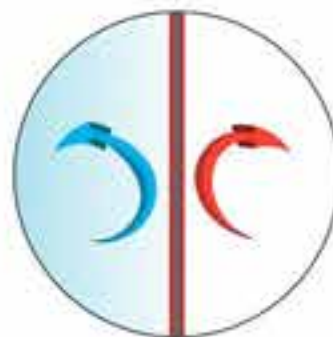
Passive House Principles



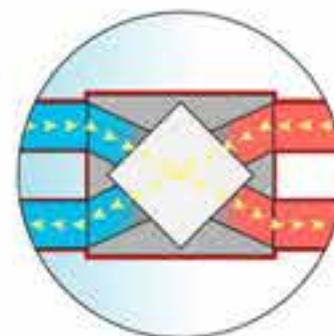
Continuous insulation



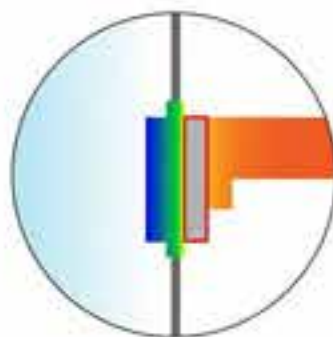
High performance windows



Exemplary airtightness

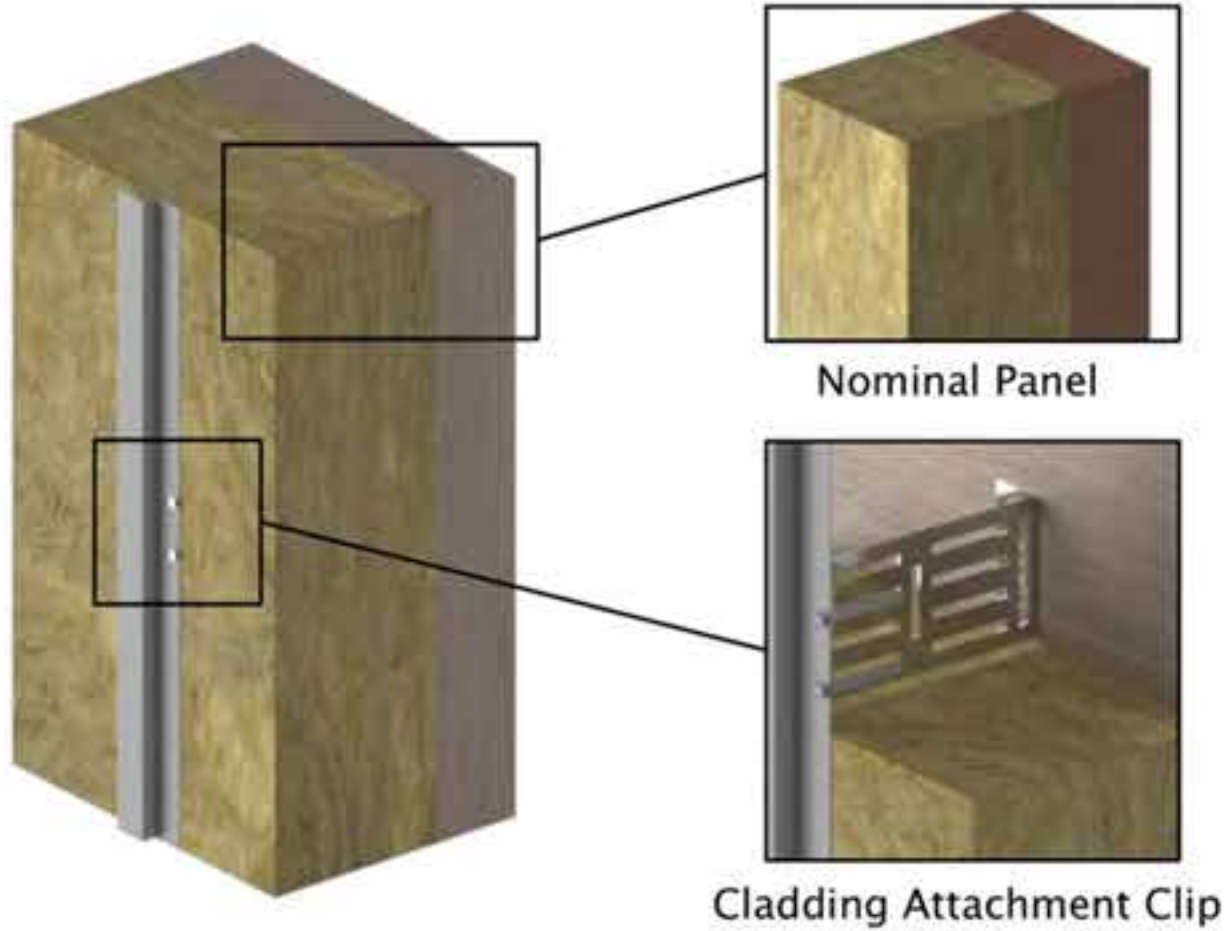


Heat recovery ventilation

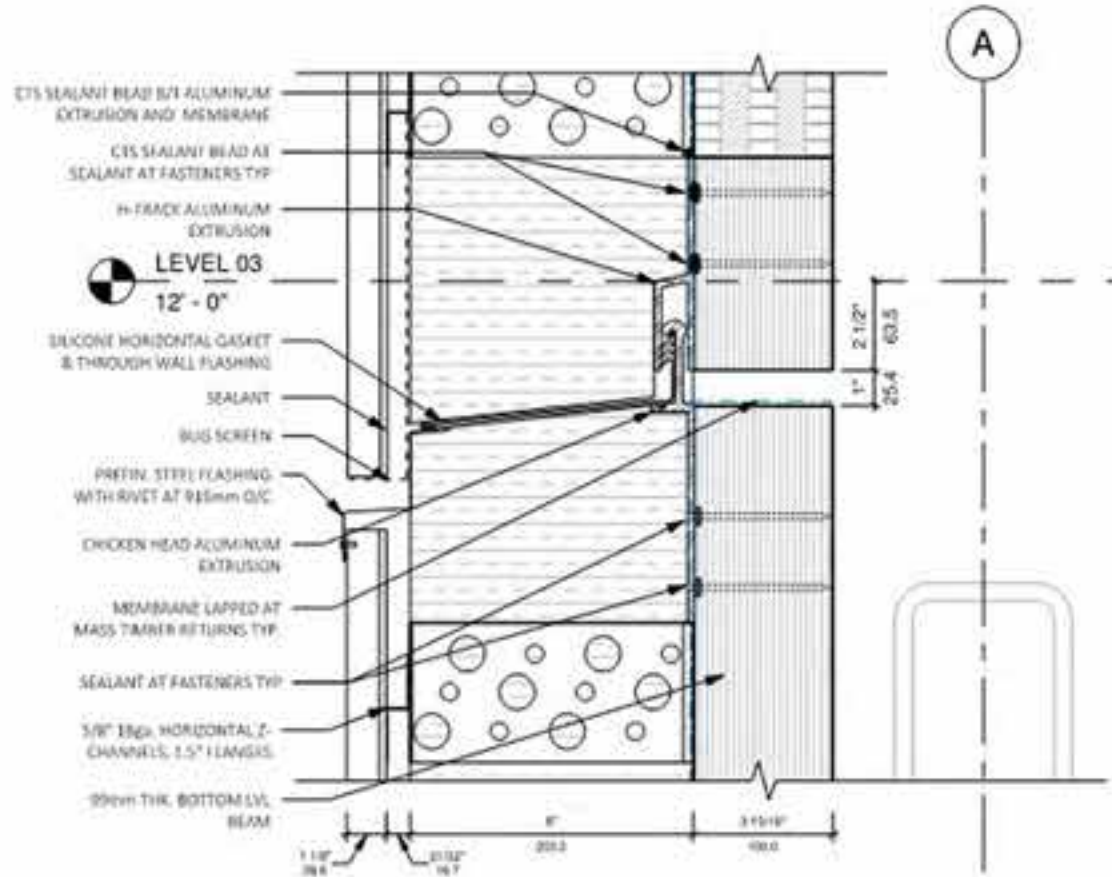


Thermal bridge-free design

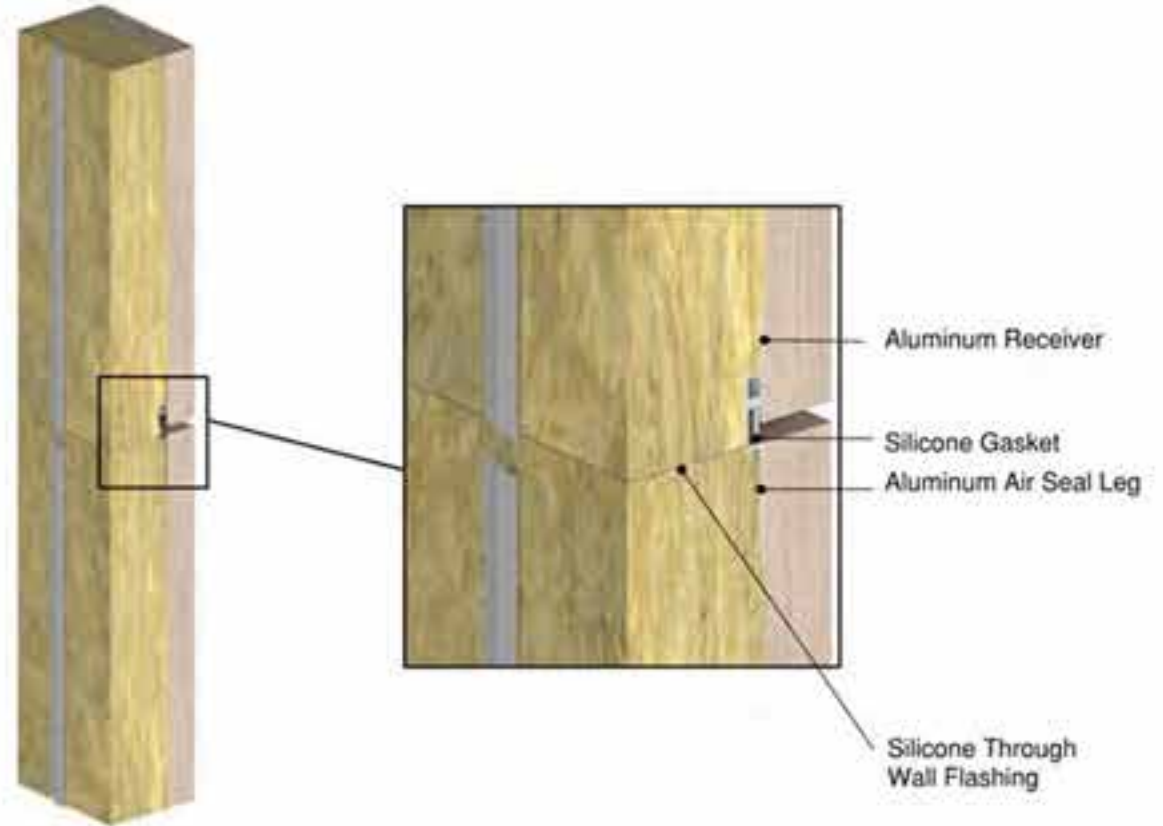
Continuous Insulation



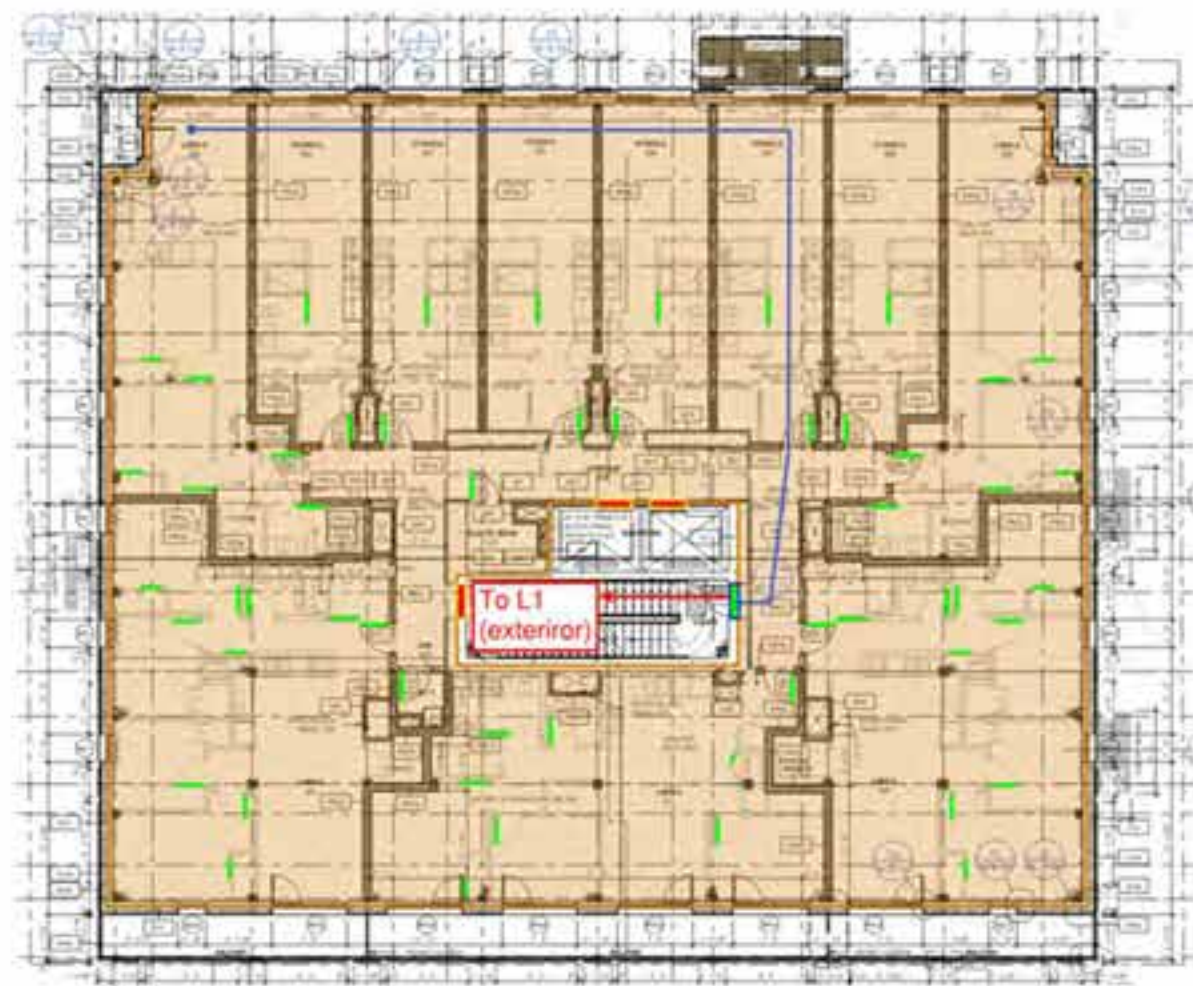
Thermal Bridge-Free Design



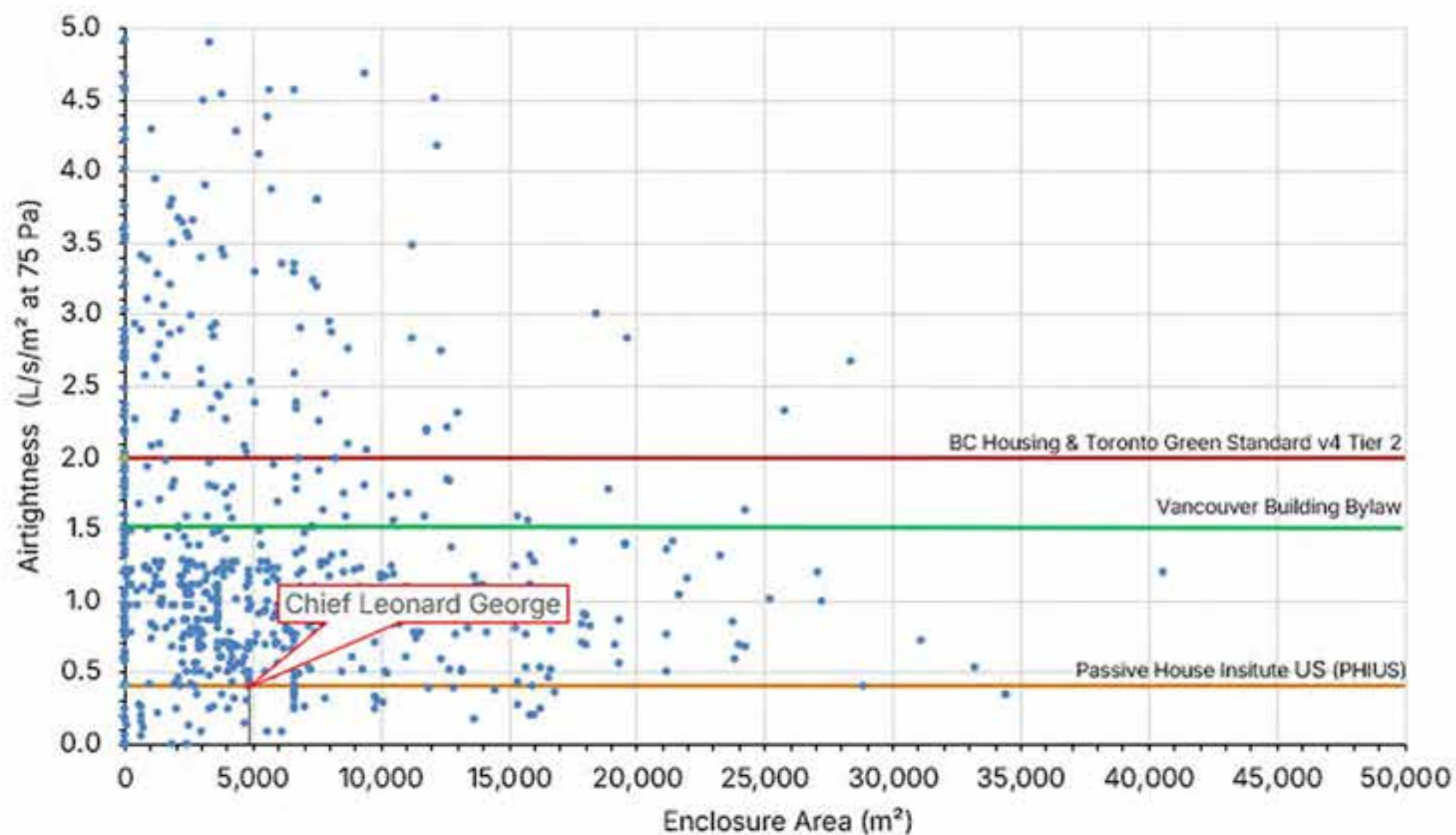
8 SEC DET - HORIZ. ENVELOPE JOINT - TYP
3' - 1'0"



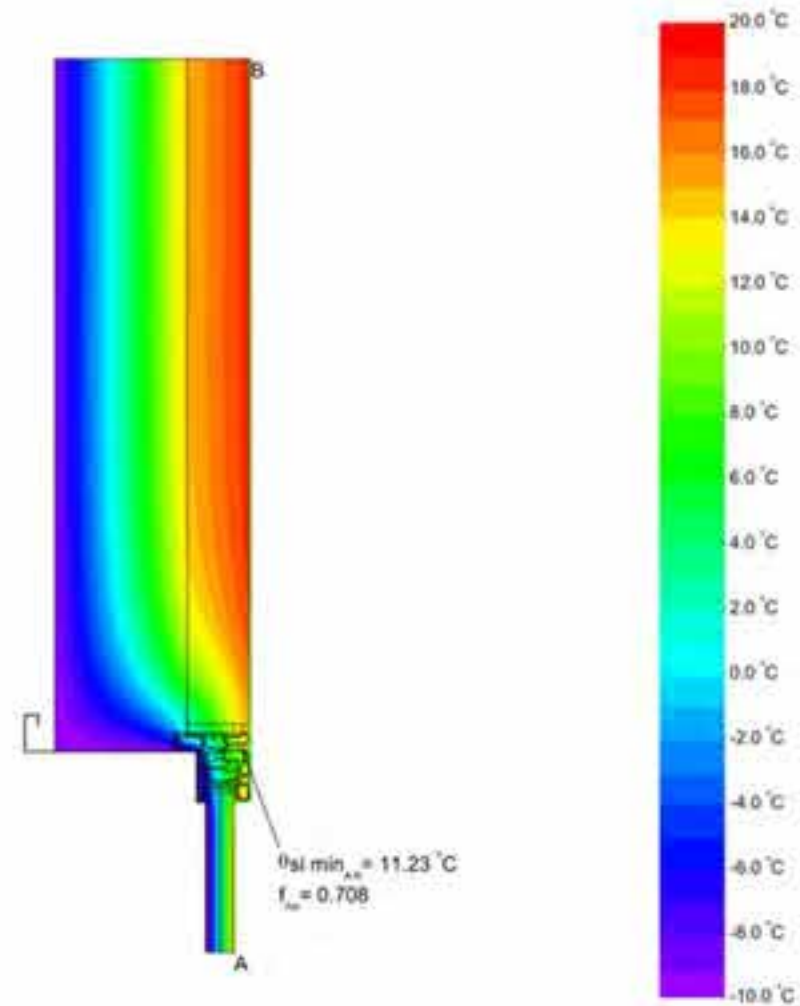
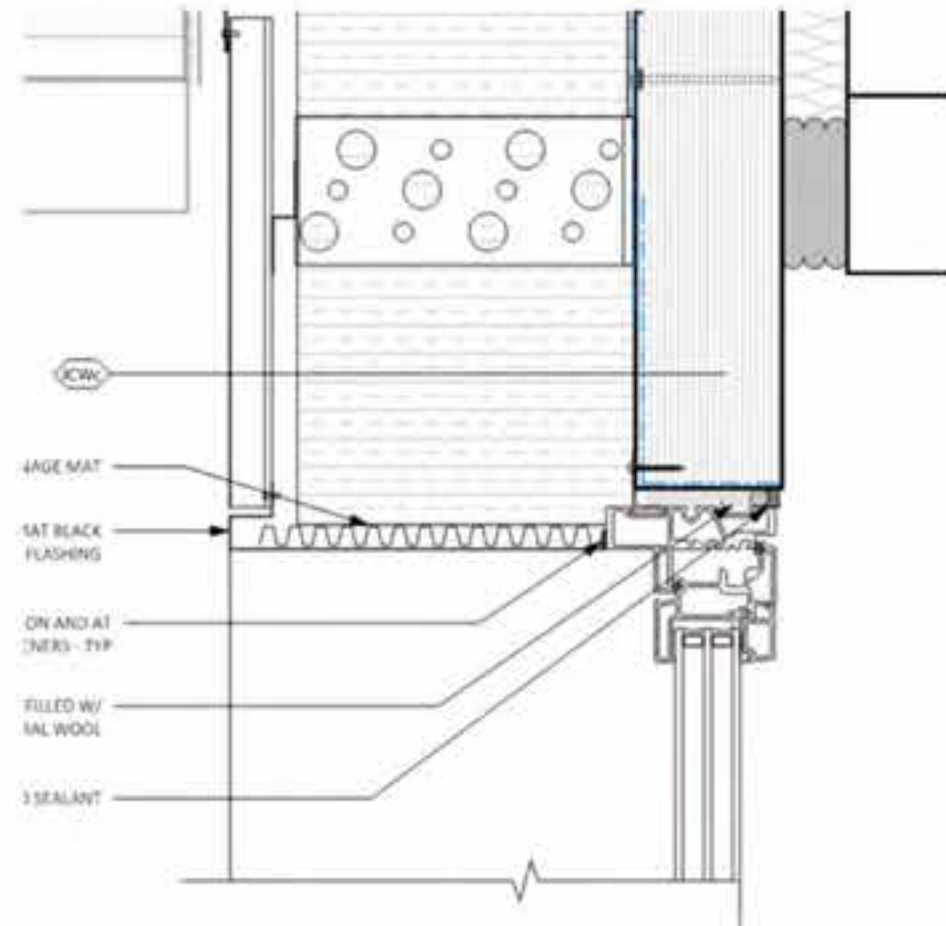
Exemplary Airtightness



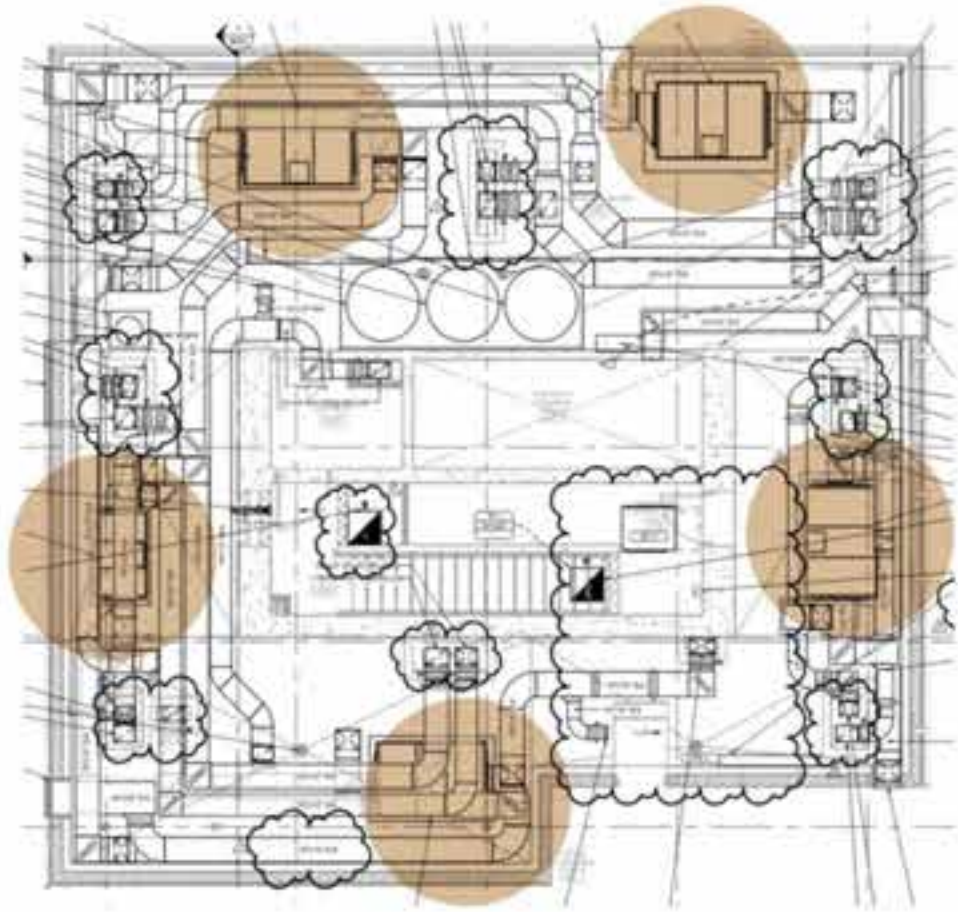
Exemplary Airtightness



High Performance Windows



Heat Recovery Ventilation



All-Electric Building



Energy & Carbon

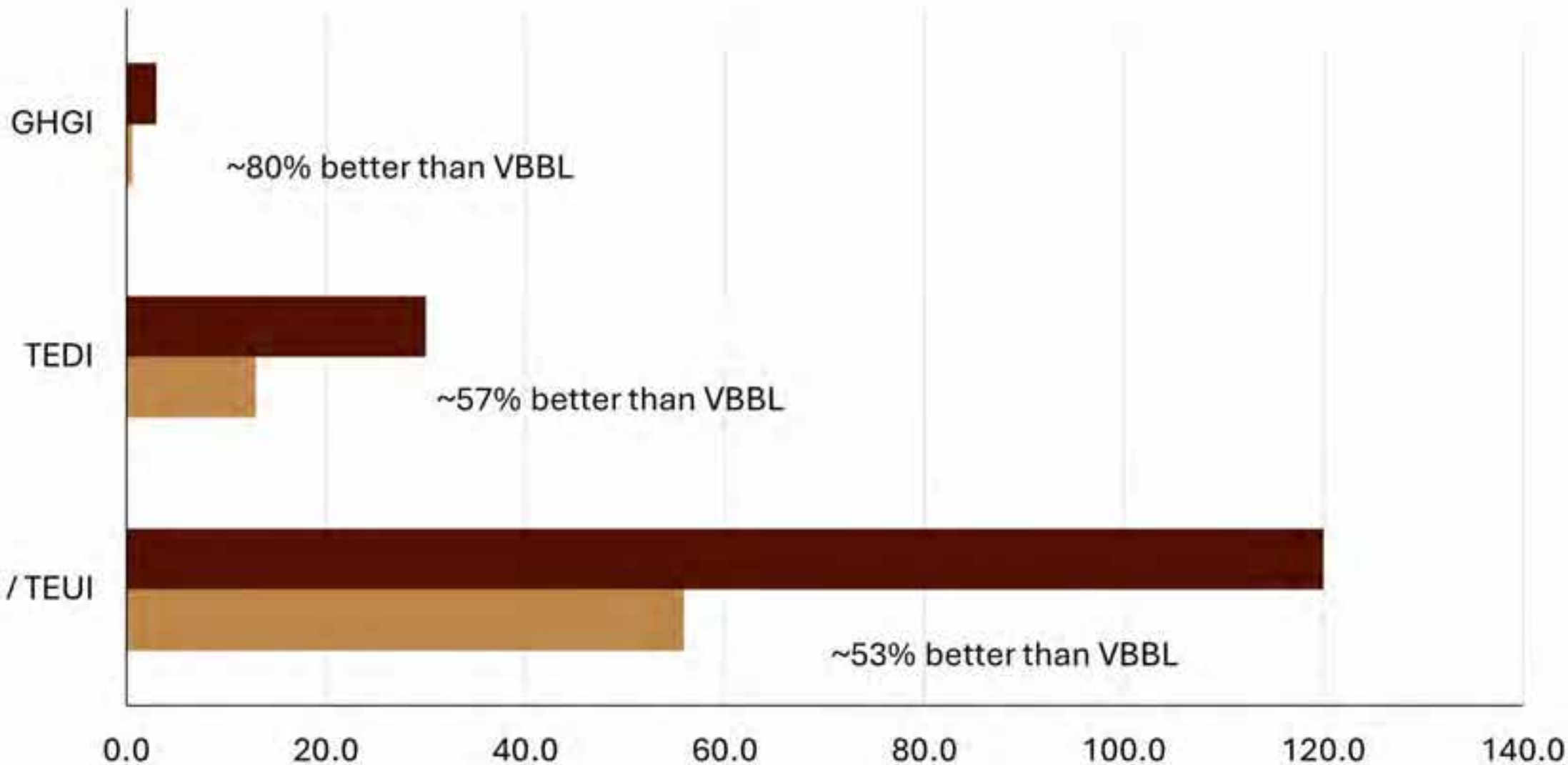
2



Final Energy Metrics

■ VBBL

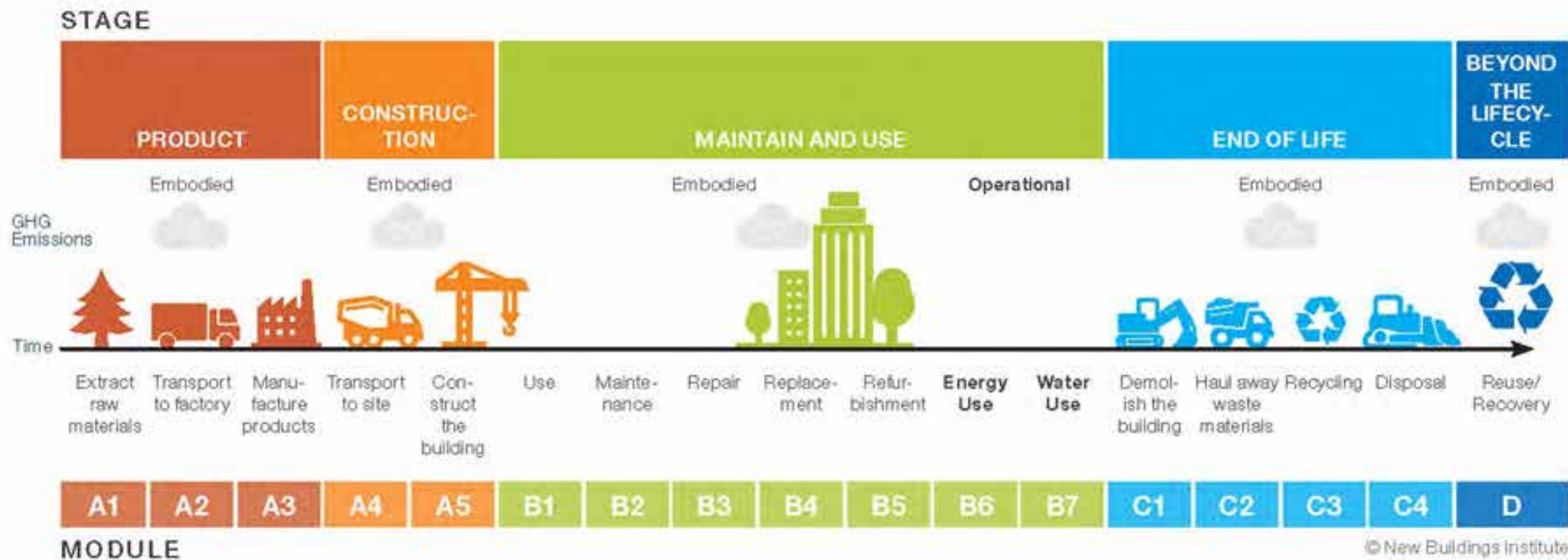
■ Chief Leonard George



What about Carbon?

FIGURE 1: LIFECYCLE STAGES

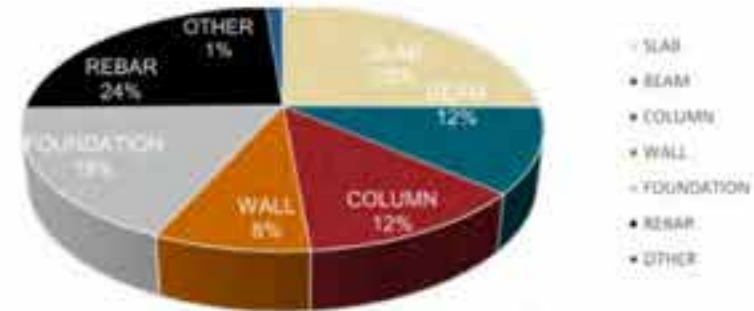
Data source: BS EN 15978:2011



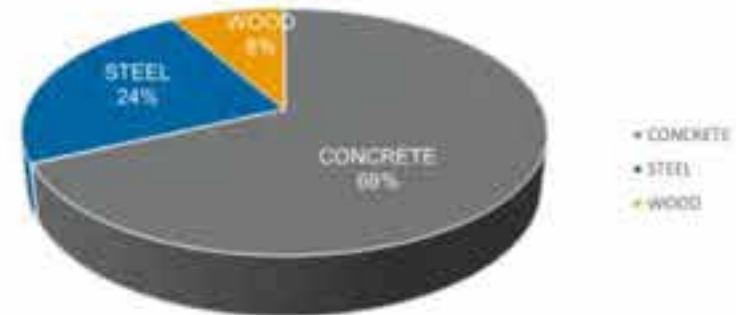
Hybrid Mass Timber Structure



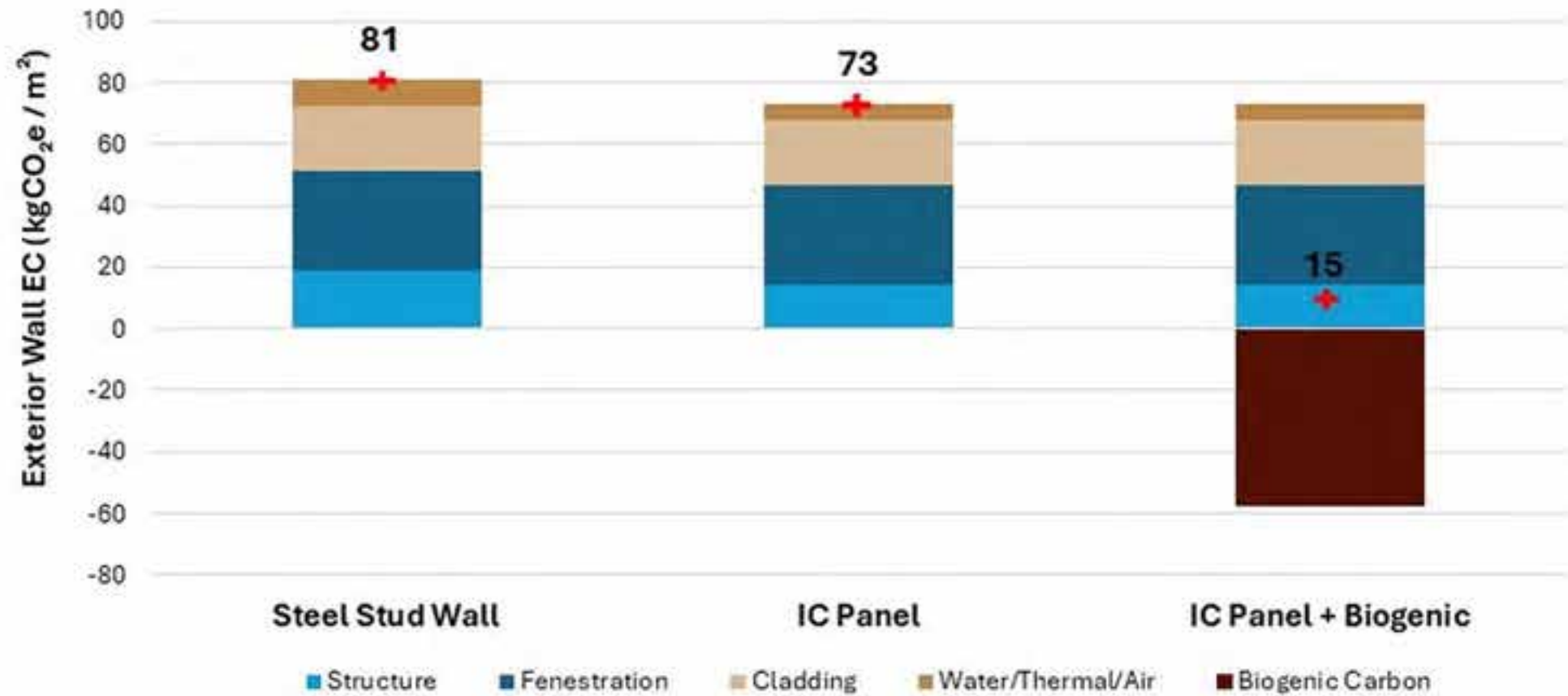
GLOBAL WARMING POTENTIAL
BY ELEMENT



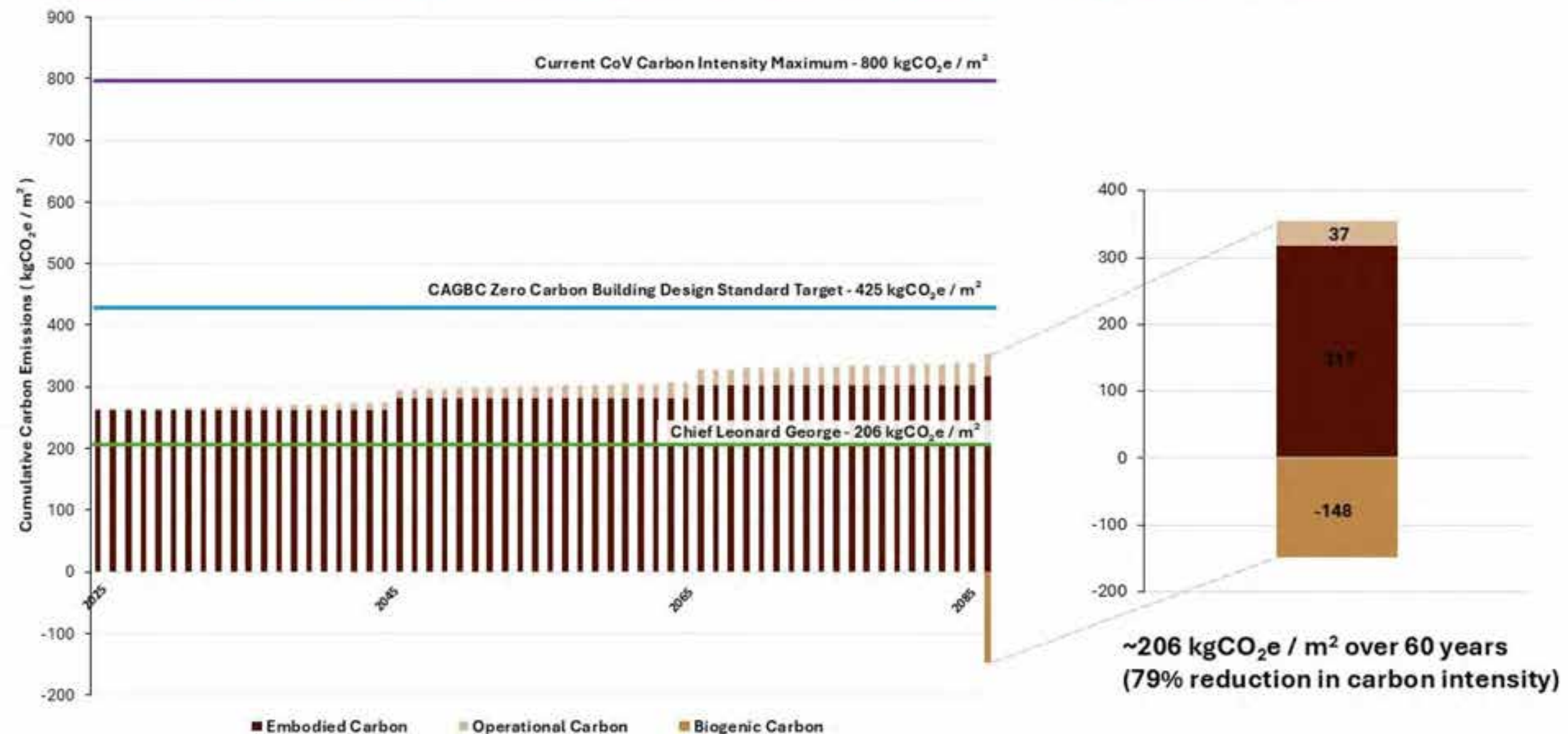
GLOBAL WARMING POTENTIAL
BY MATERIAL



Facade Embodied Carbon



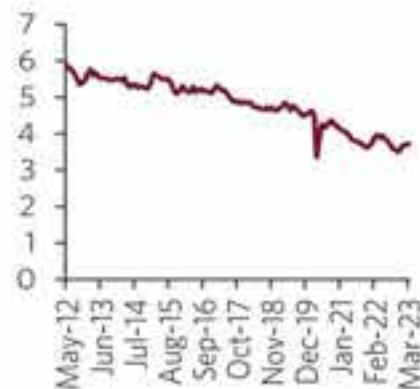
Life Cycle Carbon Emissions (Embodied + Operational)



Renewed Interest in Prefabrication

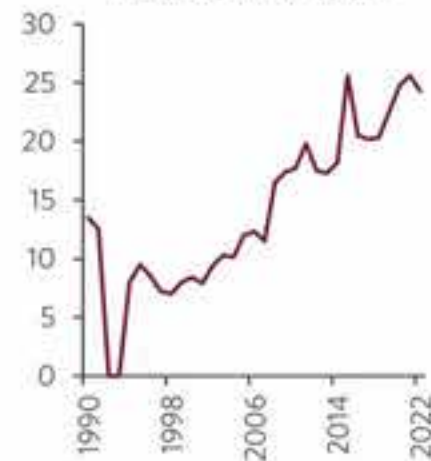
3

Number of construction workers per unit under construction

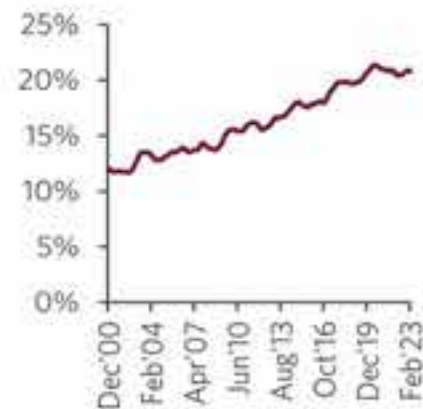


Source: Statistics Canada, CMHC, CIBC

Number of months to complete construction



Share of construction workers over the age of 55



Source: Statistics Canada, CIBC

Panelization



Physical

height of building &
accessibility of sites



Practical

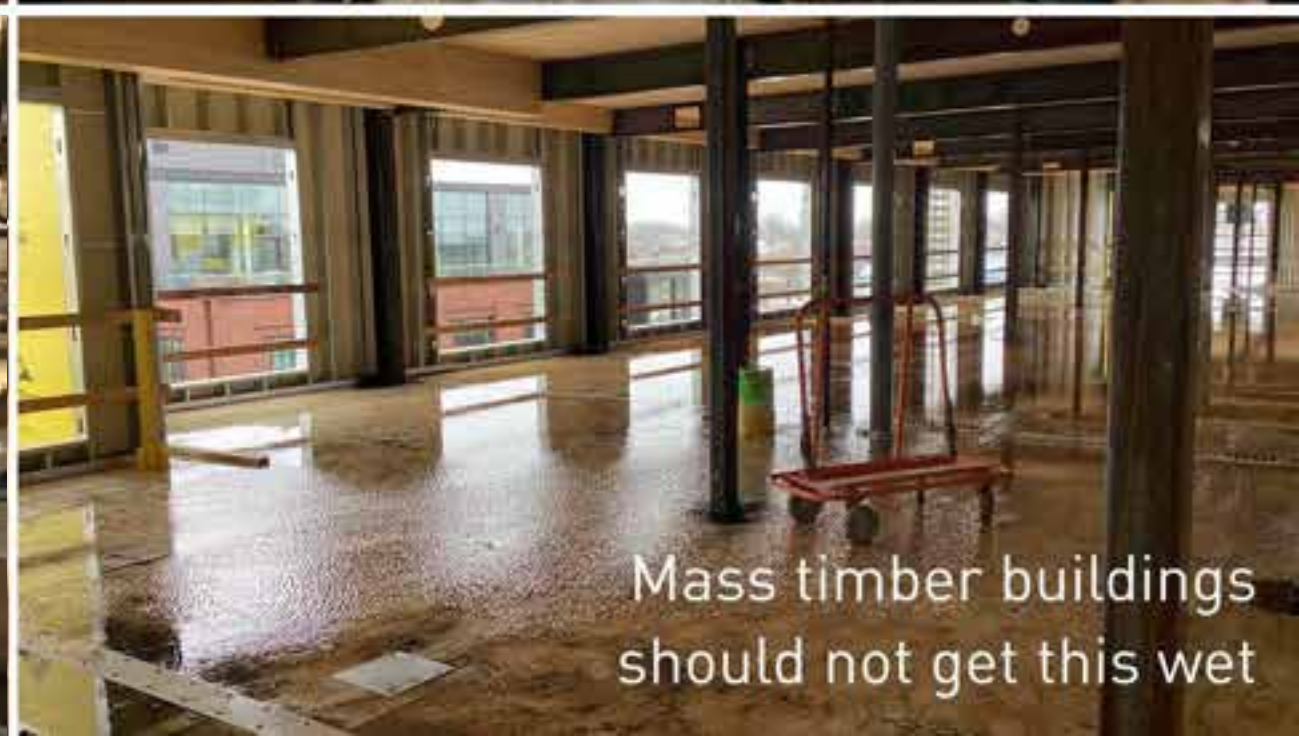
speed, cost, & local
labour availability



Environmental

energy efficiency
(PH/NZ/Step Code)





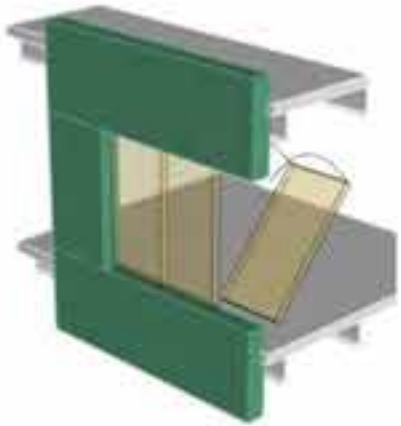
Mass timber buildings
should not get this wet

Chief Leonard
George Panel

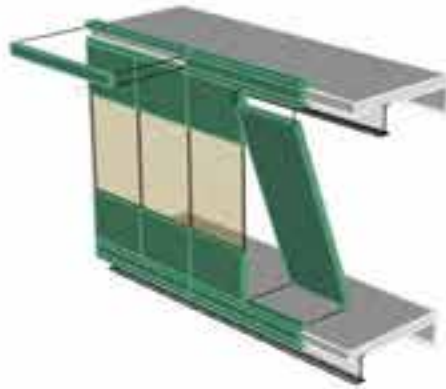
4



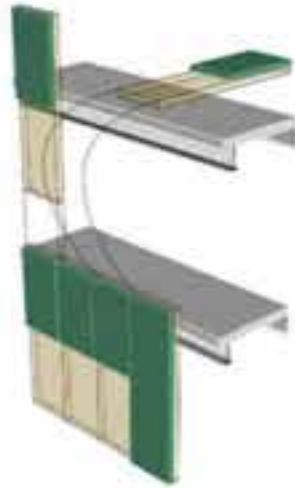
Facade Construction Options



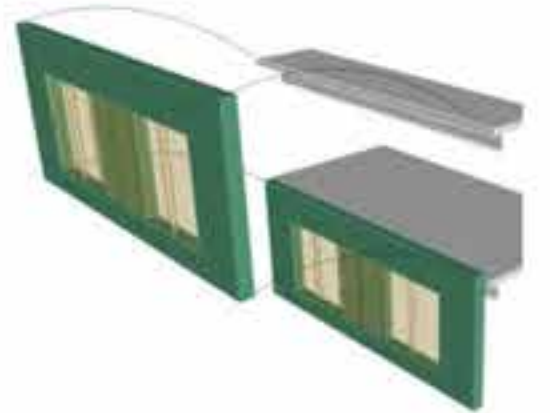
Site-Built



Window-Wall



Unitized Curtain Wall



Mega Panel

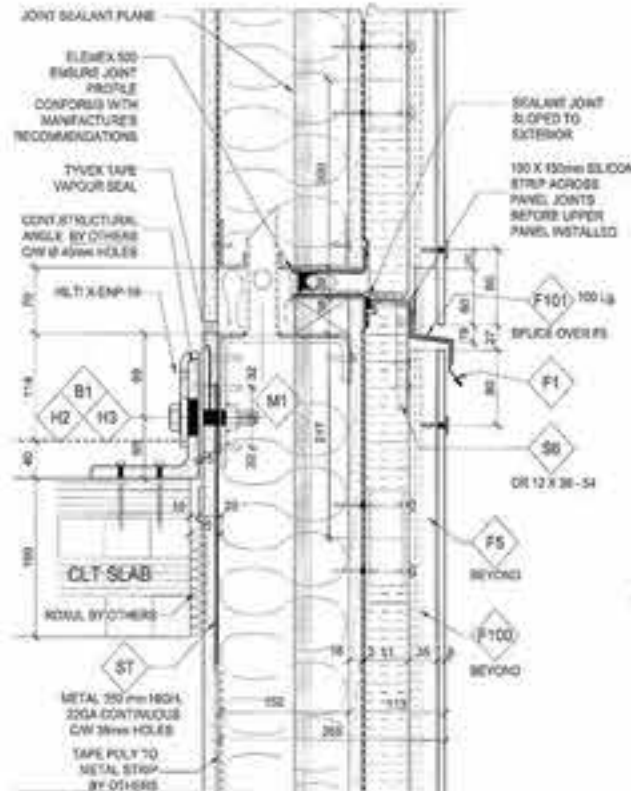
Mega Panels

Advantages

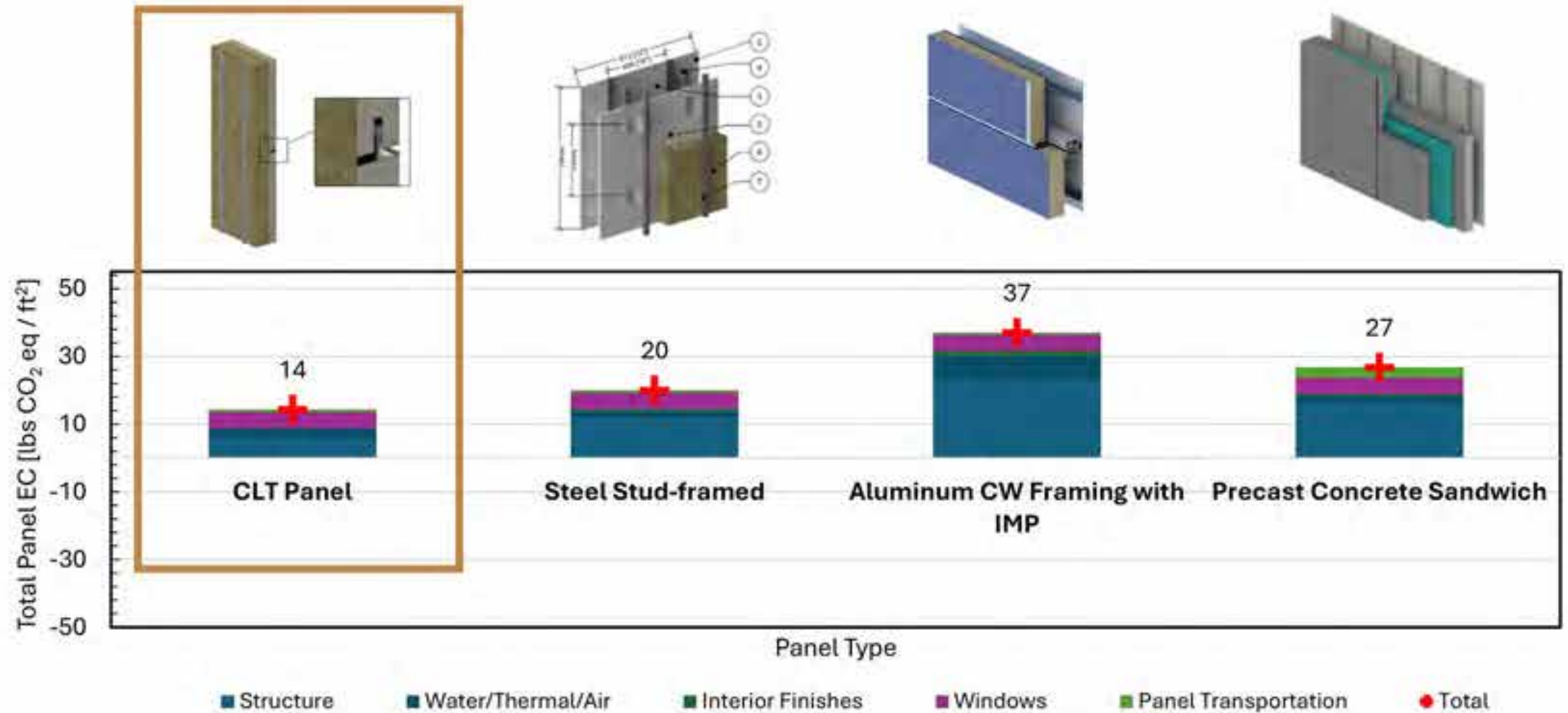
- Can integrate a wide range of punched window and cladding options
- Thermal performance targets easily achieved
- Large (fewer) panels can reduce construction time and minimize moisture exposure of building timber structure

Disadvantages

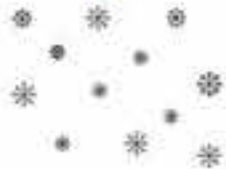
- Limited pool of suppliers (but growing)
- Design-assist process and performance mock-up often required
- Requires tower crane time



Facade Embodied Carbon



PMU Testing to Manage Risk



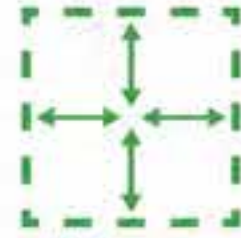
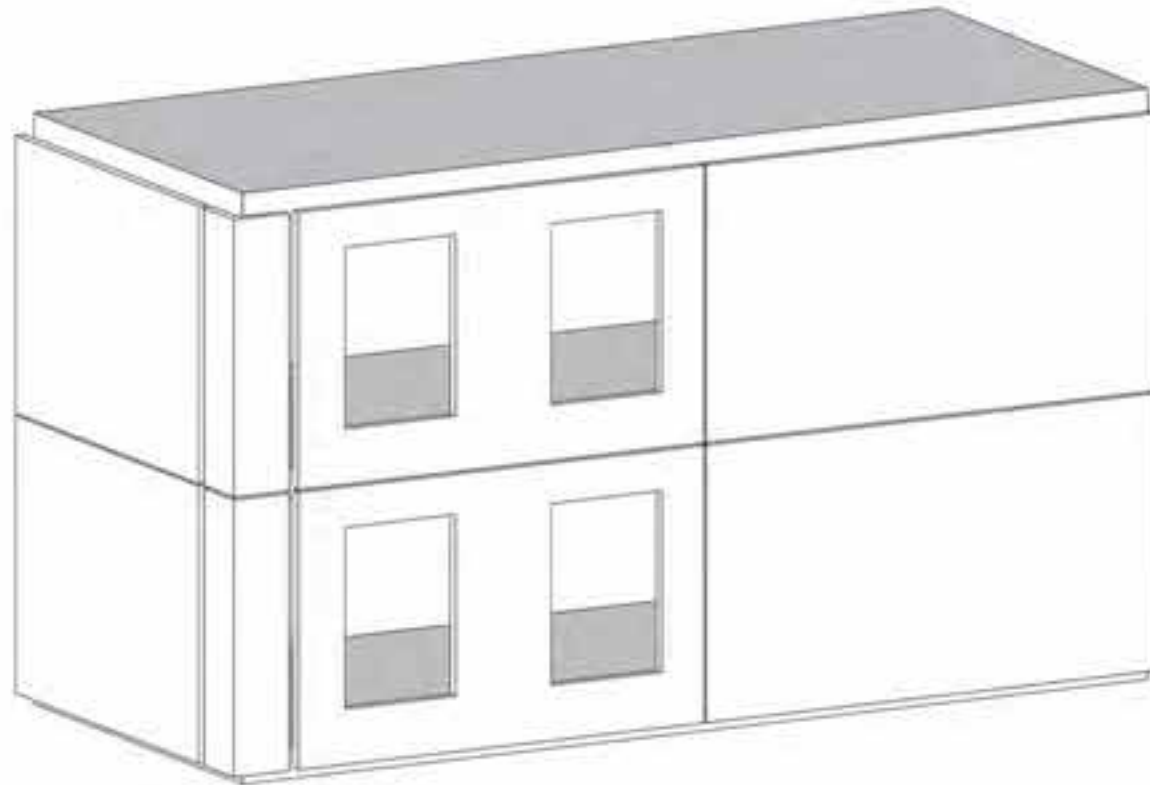
Temperature
Difference



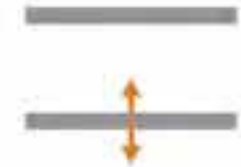
Precipitation



Wind Pressure



Air Pressure



Vertical
Displacement



Horizontal
Displacement



Intelligent
City







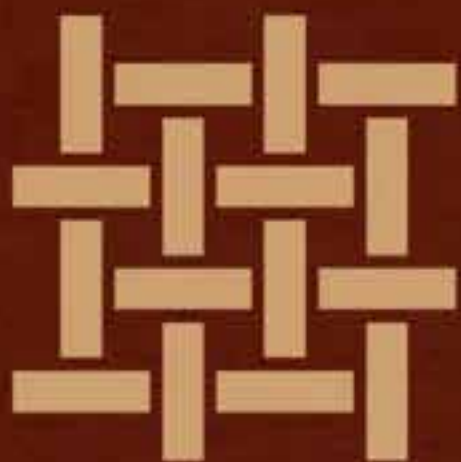












Video

