

Using a Perforated Hollow Steel Beam to Build up Timber Hybrid Fire-Rated Slim Floors

Dominic Lemieux

Vice President, Peikko North America

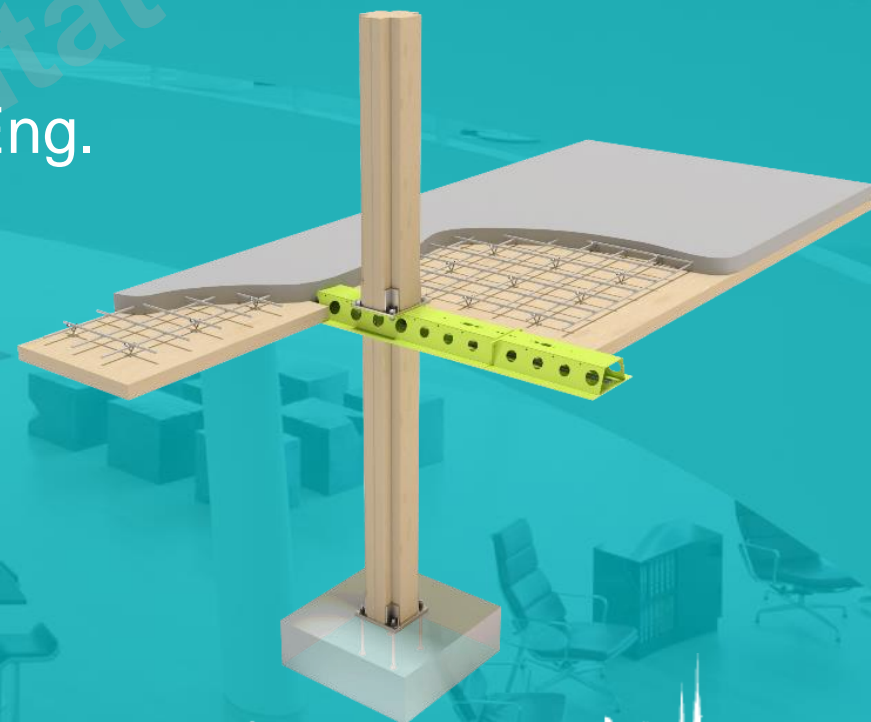


**CTBUH 2022
Steel-Timber Conference**



DESIGNING HYBRID STRUCTURES

Dominic Lemieux, P.Eng.
Vice President
Peikko USA Inc.

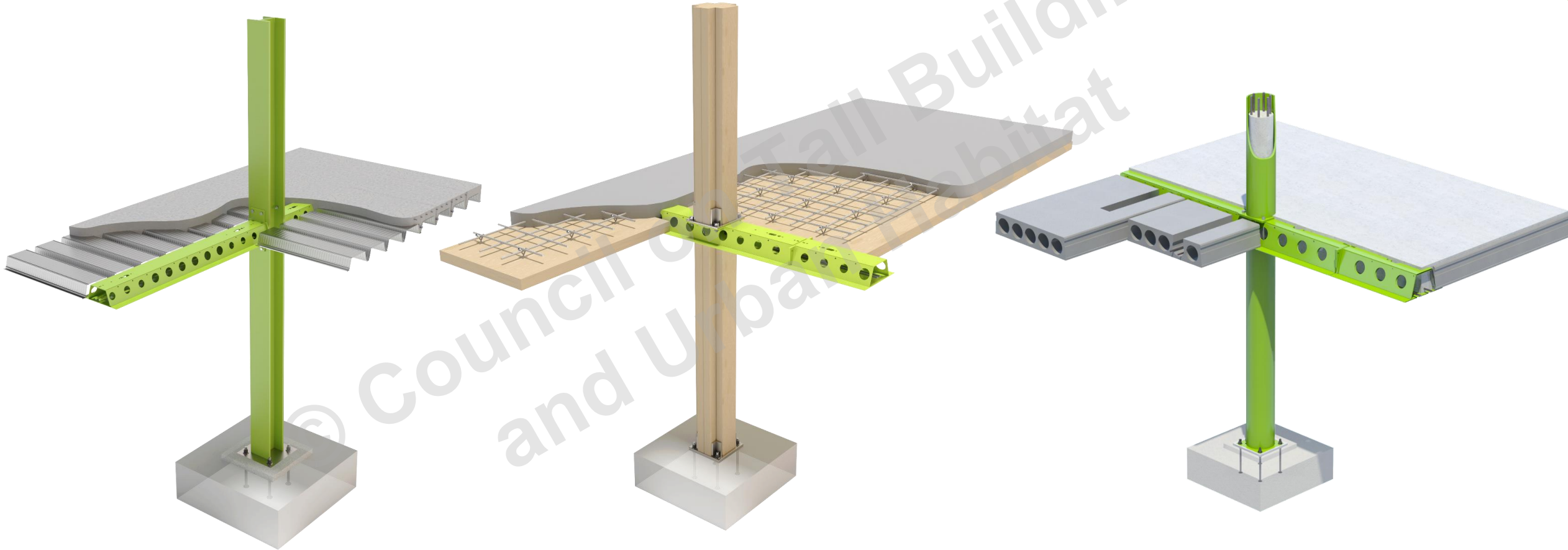
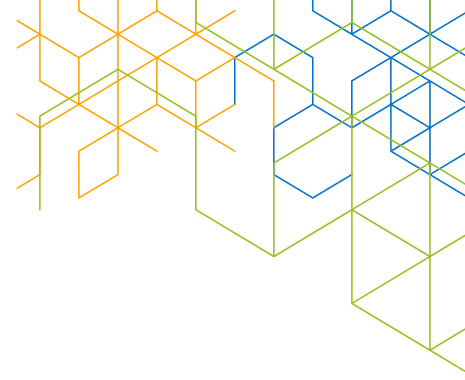


TIMBER, STEEL OR CONCRETE?

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and Urban Habitat

DELTABEAM® HYBRID STRUCTURES

TIMBER + STEEL + CONCRETE



FIRE RATED SLIM FLOOR SYSTEM

WHY SLIM FLOORS?

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A SIMPLE QUESTION:

*What is the cost in \$/ft²
of one extra vertical foot
per floor?*

*What is the cost of
cladding or curtain wall
\$/ft²?*



DELTABEAM + TIMBER

REDUCING THE FLOOR-TO-FLOOR HEIGHT



77 Wade Avenue

Toronto, ON, Canada

8 Story Office Building

- Spans:
 - Wood slab direction: 28'-10"
 - Beam direction: 26'-3"
- Loading: 50 psf live load
- GLT Timber Slabs + Composite Topping
- 2h fire resistance

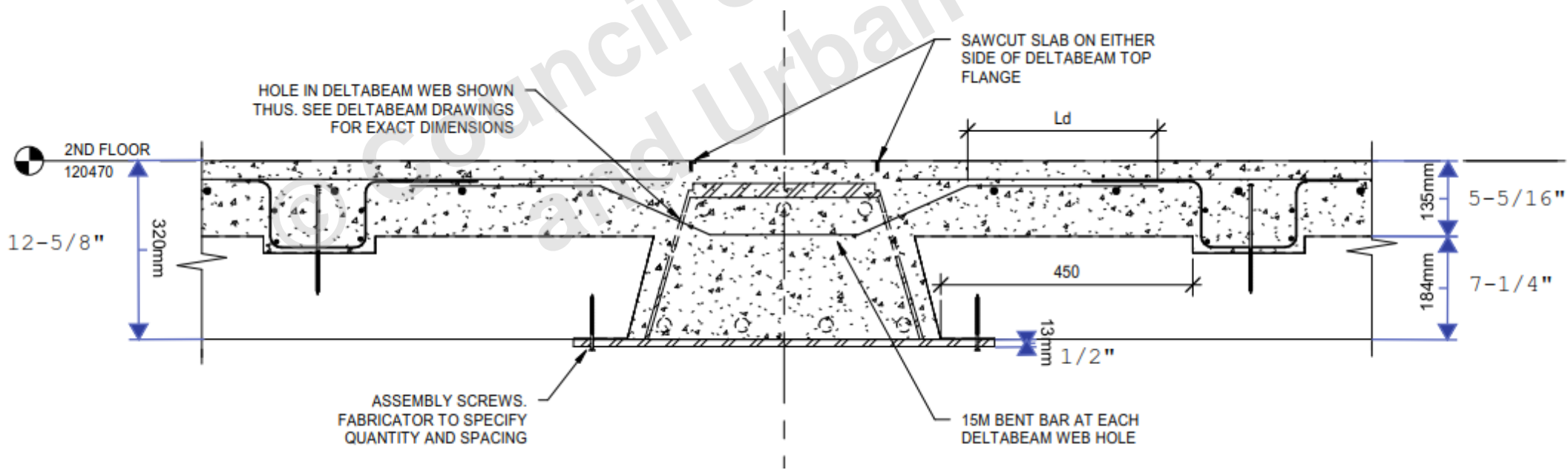
STRUCTUREFUSION
INTELLIGENT WOOD CONSTRUCTION

bnkc

next
PROPERTY GROUP

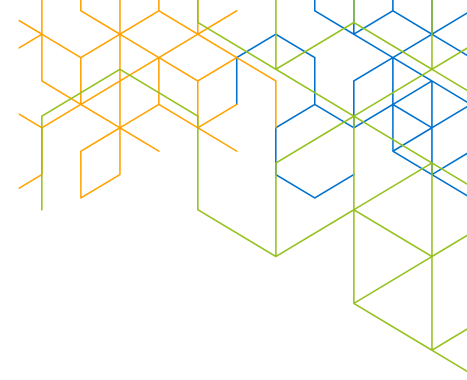
Blackwell

DELTABEAM + TIMBER



DELTABEAM + TIMBER

REDUCING THE FLOOR-TO-FLOOR HEIGHT



- $8 \times 3 \text{ ft} = 24\text{ft}$

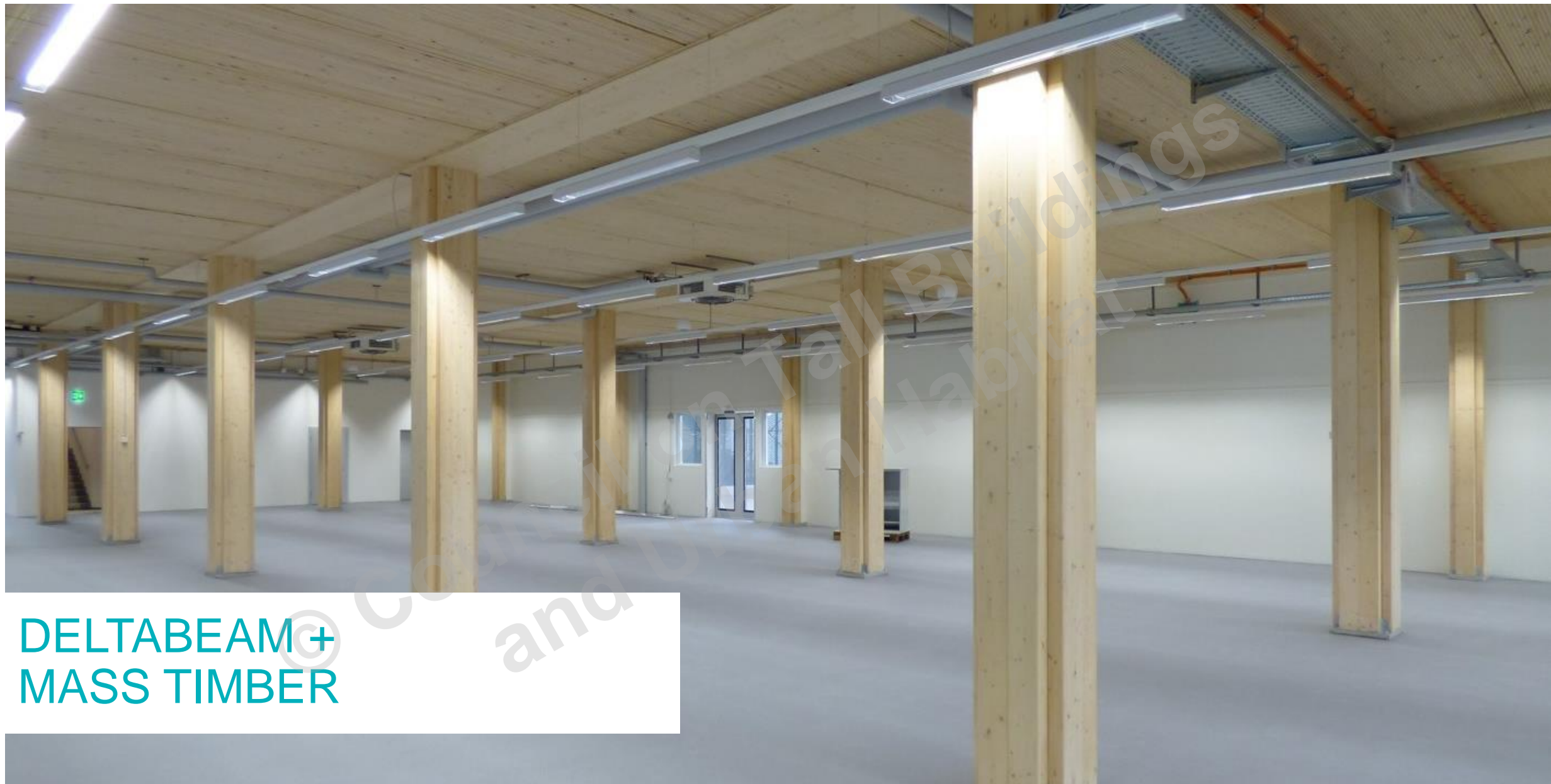
Added Extra 2 Floors!

The thinner, stronger floors helped Next and its design team make a case for two additional storeys. The added density plus the premium tenants are willing to pay for the look and the location will defray the cost and time required to refine the design and secure buy-in from the City of Toronto's building code officials.

Cary Solomon,
President & CEO
Next Property Group



DELTABEAM +
MASS TIMBER



DELTABEAM+
MASS TIMBER

BACK TO THE QUESTION:

What is the price in \$/ft² of one extra vertical foot per floor?

Just for Cladding:

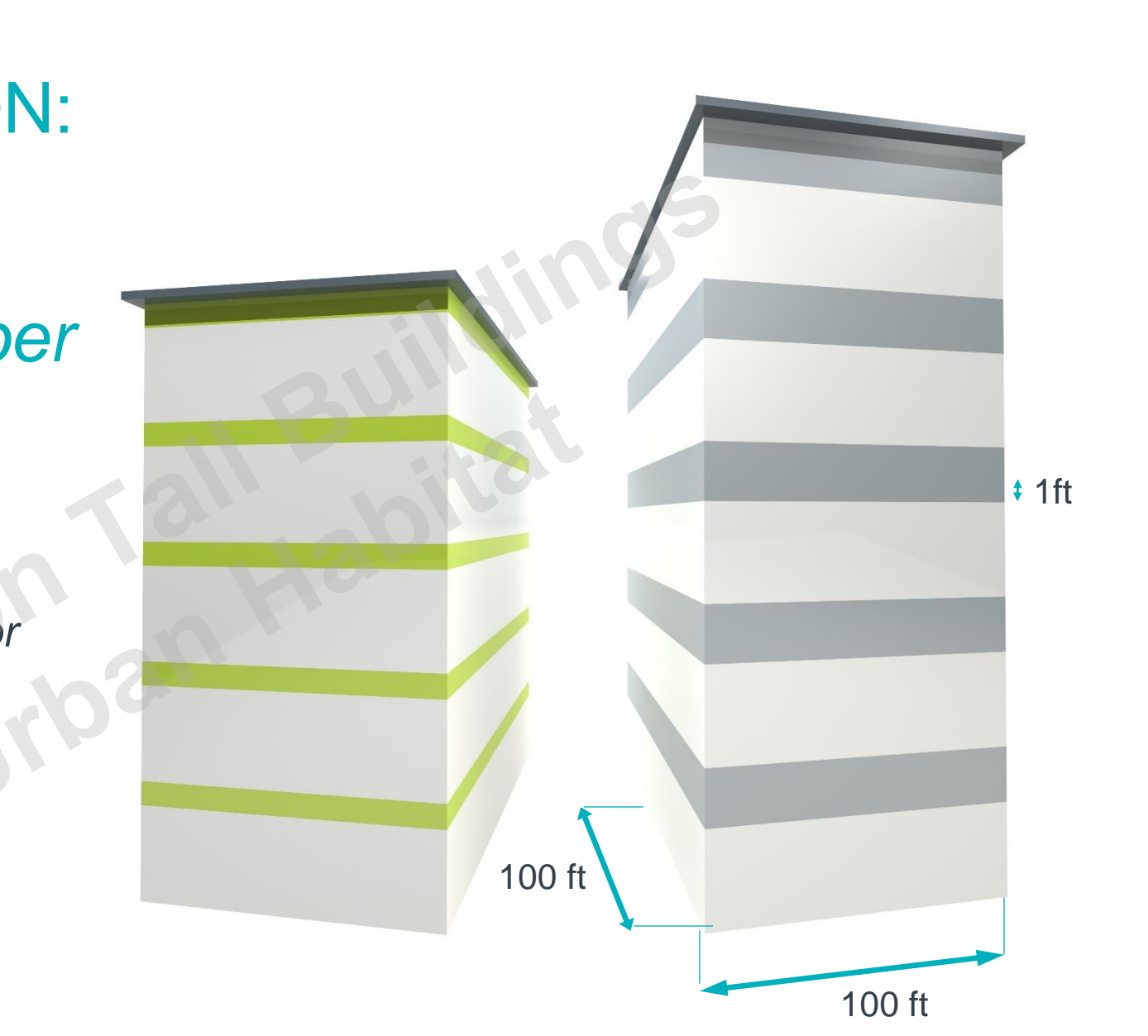
Cladding Area: $4 \times 100' \times 1' = 400\text{ft}^2$ / floor

Value: $400\text{ft}^2 \times \$100/\text{ft}^2 = \$40,000$ / floor

Floor area: $100' \times 100' = 10,000 \text{ft}^2$

Cost (\$/ft²) = $\$40,000 / 10,000\text{ft}^2$

Answer: \$4/ft²



BACK TO THE QUESTION:

77 Wade Avenue

Toronto, ON, Canada

Just for Curtain Wall:

Wall Area: $2 \times (75' + 272') \times 3' = 2,080\text{ft}^2$ / floor

Value: $2080\text{ft}^2 \times \$140/\text{ft}^2 = \$290,000$ / floor

Floor area: $75' \times 272' = 20,400\text{ft}^2$

Cost ($\$/\text{ft}^2$) = $\$290,000 / 20,400\text{ft}^2$

Answer: $\$14/\text{ft}^2$

$\$290,000 \times 8 \text{ floors} \approx \$2,3\text{M}$



FIRE RESISTANCE

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and Urban Habitat



N904, N905, N906 & N907

INTEGRATED FIRE RESISTANCE



SHOP INSTALLED REINFORCEMENT FOR FIRE RESISTANCE

LONG SPANS & FLEXIBILITY

© Council on Tall Buildings
and Urban Habitat

DELTABEAM + TIMBER



RENOVATION & REUSE = 50-75% LESS ECE



EXTRA LONG SPANS

36 FEET

4 PARKING STALLS BETWEEN COLUMNS



Create
demanding
shapes,
easily



TALL BUILDINGS

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and Urban Habitat

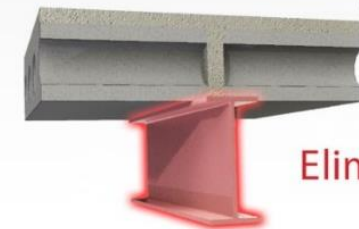


300 Main, 42 story tower Winnipeg, Canada

DELTABEAM®
*Reduced the building
height by over 60 feet*



Precast Hollowcore Slab



Eliminates Wide Flanges



THANK YOU